Call for Symposium Proposals

Symposium proposals for the 2014 AAAS Annual Meeting are now being solicited. To submit a proposal, visit www.aaas.org/meetings. The deadline for submission is 23 April 2013.

Meeting Global Challenges: Discovery and Innovation

Scientific discovery and innovation are helping to drive solutions to current and future global challenges. Economic progress in every community worldwide has meanwhile become increasingly interdependent with advances in science and technology. Challenges related to ensuring sufficient food for a growing population, quality healthcare, renewable fuels, and a sustainable and enriching environment demand innovation and international dialogue. Addressing these challenges depends upon discoveries emerging from the convergence of physical, life, engineering, and social sciences in innovative ways that are most useful to society.

In a weakened global economy, many countries have begun to limit their investments in the future. Yet, investments in innovations — including funding for education as well as basic and applied research — represent our best prospect for a sustainable environment and increased economic growth. Economists estimate, after all, that innovation in science and technology are the source of more than half of the economic growth in many countries. By increasing innovation in sustainable products and processes, world economies can continue to enhance human welfare across society.

Innovation springs from the translation, production, and distribution of discovery and invention to society. In the contemporary world, this is not a linear process, but rather, a matrix of interactions. Societies, with support from public and private sectors and institutions, struggle to integrate the necessary disciplines and interests into this matrix. Within the scientific and engineering community, we need to better integrate different disciplines and voices into a consensus supporting innovation. Developed and developing countries that accomplish this will become the economies of the future.

At the same time, it is imperative that we work in ways that are transparent and open to a diversity of contributors and ideas. Assessing risk versus benefit in adopting an innovation is complex and depends upon an open dialogue. Only then will we realize the promise of furthering scientific discovery and innovation to meet pressing global challenges and improve quality of life.

Call for Poster Submissions

Online entries will be accepted at www.aaas.org/meetings beginning 14 May 2013.
NSF Robert Noyce Teacher Scholarship Program Conference

Building Excellence in STEM Teaching

May 29-31, 2013
Hyatt Regency on Capitol Hill

Co-hosted by
American Association for the Advancement of Science (AAAS)
Education and Human Resources Program (EHR)
and
National Science Foundation (NSF) Division of Undergraduate Education (DUE)
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National Science Foundation (NSF) Robert Noyce Teacher Scholarship Program

The Robert Noyce Teacher Scholarship Program, first authorized under the National Science Foundation Authorization Act of 2002 (P.L. 107-368) and reauthorized in 2007 under the America COMPETES Act (P.L. 110-69) and the America COMPETES Reauthorization Act of 2010 responds to the critical need for K-12 teachers of science, technology, engineering, and mathematics (STEM) by encouraging talented STEM students and professionals to pursue teaching careers in elementary and secondary schools.

The program provides funding to institutions of higher education to provide scholarships, stipends, and programmatic support to recruit and prepare STEM majors and professionals to become K-12 teachers. Scholarship and stipend recipients are required to complete two years of teaching in a high-need school district for each year of support. The program seeks to increase the number of K-12 teachers with strong STEM content knowledge who teach in high-need school districts.

In addition, the program supports the recruitment and development of NSF Teaching Fellows, STEM professionals who complete Master’s degrees leading to teacher certification and receive salary supplements while fulfilling a 4-year teaching requirement. The program also supports the development of NSF Master Teaching Fellows by providing professional development and salary supplements while they are teaching for five years in a high need school district. A goal of the program is to recruit individuals with strong STEM backgrounds who might otherwise not have considered a career in K-12 teaching.

The American Association for the Advancement of Science (AAAS) is working with the NSF Robert Noyce Teacher Scholarship Program to identify and disseminate information about effective practices and strategies for attracting, selecting, and preparing new K-12 STEM teachers and retaining them in the STEM teacher workforce. Project components include:

- Producing a general publication that highlights the accomplishments of the NSF Noyce Teacher Scholarship Program.
- Organizing proposal preparation workshops.

American Association for the Advancement of Sciences (AAAS)

The American Association for the Advancement of Science (AAAS), is an international non-profit organization dedicated to advancing science around the world by serving as an educator, leader, spokesperson and professional association. In addition to organizing membership activities, AAAS publishes the journal Science, http://www.sciencemag.org/, as well as many scientific newsletters, books and reports, and spearheads programs that raise the bar of understanding for science worldwide.

AAAS was founded in 1848, and includes some 261 affiliated societies and academies of science, serving 10 million individuals. Science has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of one million. The non-profit AAAS is open to all and fulfills its mission to “advance science and serve society” through initiatives in science policy; international programs; science education; and more. For the latest research news, log onto EurekAlert!, http://www.eurekalert.org/, the premier science-news website, a service of AAAS.

Membership and Programs

Open to all, AAAS membership includes a subscription to Science. Four primary program areas fulfill the AAAS mission:

- Science and Policy
- International Activities
- Education and Human Resources
- Project 2061

AAAS Mission

AAAS seeks to “advance science, engineering, and innovation throughout the world for the benefit of all people.” To fulfill this mission, the AAAS Board has set these broad goals:

- Enhance communication among scientists, engineers, and the public;
- Promote and defend the integrity of science and its use;
- Strengthen support for the science and technology enterprise;
- Provide a voice for science on societal issues;
- Promote the responsible use of science in public policy;
- Strengthen and diversify the science and technology workforce;
- Foster education in science and technology for everyone;
- Increase public engagement with science and technology; and
- Advance international cooperation in science.

Visit the AAAS website at http://www.aaas.org/.
## Wednesday, May 29, 2013

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>3:30 pm - 5:00 pm</td>
<td><strong>Museum Tours for Scholars and Fellows (optional)</strong>&lt;br&gt; (Meet at the Regency Foyer Wall)</td>
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<tr>
<td>4:30 pm - 5:30 pm</td>
<td><strong>New Awardees Session with National Science Foundation (NSF)</strong>&lt;br&gt; (Capitol Room)</td>
</tr>
<tr>
<td>4:30 pm - 5:30 pm</td>
<td><strong>Joan Prival</strong>, Noyce Lead Program Director, Division of Undergraduate Education (DUE), NSF</td>
</tr>
<tr>
<td>4:30 pm - 5:30 pm</td>
<td><strong>Noyce Monitoring System</strong>&lt;br&gt; Michael Rossi, ICF International&lt;br&gt; Margaret Carlin, ICF International</td>
</tr>
<tr>
<td>7:00 pm - 10:00 pm</td>
<td><strong>Registration</strong>&lt;br&gt; (Regency Foyer Wall)</td>
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<tr>
<td>7:00 pm - 10:00 pm</td>
<td><strong>Poster Setup</strong>&lt;br&gt; (Columbia A, B, and C / Columbia Foyer Regency Foyer)</td>
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## Thursday, May 30, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>7:00 am - 8:00 am</td>
<td><strong>Registration</strong>&lt;br&gt; (Regency Foyer Wall)</td>
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<td>7:00 am - 8:00 am</td>
<td><strong>Poster Setup</strong>&lt;br&gt; (Columbia A, B, and C / Columbia Foyer Regency Foyer)</td>
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<tr>
<td>7:00 am - 8:00 am</td>
<td><strong>Continental Breakfast</strong>&lt;br&gt; (Regency Ballroom A, B, and C)</td>
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<tr>
<td>8:00 am - 9:00 am</td>
<td><strong>Opening and Welcome:</strong>&lt;br&gt; (Regency Ballroom A, B, and C)</td>
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<tr>
<td>8:00 am - 9:00 am</td>
<td><strong>Joan Prival</strong>, Noyce Lead Program Director, DUE, NSF</td>
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<tr>
<td>8:00 am - 9:00 am</td>
<td><strong>Susan Singer</strong>, Division Director, DUE, NSF</td>
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<tr>
<td>8:00 am - 9:00 am</td>
<td><strong>Shirley M. Malcom</strong>, Director, EHR, AAAS</td>
</tr>
<tr>
<td>9:15 am - 10:30 am</td>
<td><strong>Concurrent Workshops: Session I</strong>&lt;br&gt; (See handout for workshop locations.)</td>
</tr>
<tr>
<td>10:45 am - 11:45 am</td>
<td><strong>Panel: Voices from the Field</strong>&lt;br&gt; (Regency Ballroom A, B, and C)</td>
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<tr>
<td>10:45 am - 11:45 am</td>
<td><strong>Moderator:</strong>&lt;br&gt; <strong>Steven Ruthford</strong>, Albert Einstein&lt;br&gt; Distinguished Educator Fellow, DUE, NSF</td>
</tr>
<tr>
<td>10:45 am - 11:45 am</td>
<td><strong>Panelists:</strong> (Scholars)&lt;br&gt; <strong>Emily Tannenbaum</strong>, Bronx Latin School, New York, NY&lt;br&gt; <strong>Jeanell Calhoun</strong>, C.F. Vigor High School, Prichard, AL&lt;br&gt; <strong>Rick Barlow</strong>, Fremont High School, Sunnyvale, CA&lt;br&gt; <strong>Briana Wirth</strong>, Mitchell Middle School, Mitchell, SD&lt;br&gt; <strong>Kenric Davies</strong>, Sherman High School, Sherman, TX&lt;br&gt; <strong>Stefni Evans</strong>, USC, Hybrid High School, Los Angeles, CA</td>
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<tr>
<td>12:00 pm - 1:30 pm</td>
<td><strong>Lunch and Keynote</strong>&lt;br&gt; (Regency Ballroom A, B, and C)</td>
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<tr>
<td>12:00 pm - 1:30 pm</td>
<td><strong>Keynote:</strong>&lt;br&gt; “An Inquiry into Science Education, Where the Rubber Meets the Road”</td>
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<td>1:30 pm - 2:45 pm</td>
<td><strong>Poster Session 1</strong>&lt;br&gt; (Columbia A, B, C and Columbia Foyer Regency Foyer)</td>
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<td>3:00 pm - 4:15 pm</td>
<td><strong>Concurrent Workshops: Session II</strong>&lt;br&gt; (See handout for workshop locations.)</td>
</tr>
<tr>
<td>4:30 pm - 5:00 pm</td>
<td><strong>Noyce Program Evaluation</strong>&lt;br&gt; <strong>Ellen Bobronnikov</strong>, Abt Associates, Inc.&lt;br&gt; <strong>Cristofer Price</strong>, Abt Associates, Inc.</td>
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<td>4:30 pm - 5:00 pm</td>
<td><strong>“Preliminary Findings from the Noyce Program Evaluation”</strong></td>
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AGENDA

5:15 pm - 6:30 pm  
**Poster Session 2**  
(Columbia A, B, C, and Columbia Foyer / Regency Foyer)

6:45 pm - 8:30 pm  
**Reception and Networking**  
(Regency Ballroom A, B, and C)

8:30 pm  
**Remove Posters**  
(Columbia A, B, C, and Columbia Foyer / Regency Foyer)

**FRIDAY, MAY 31, 2013**

7:00 am - 8:00 am  
**Continental Breakfast**  
(Regency Ballroom A, B, and C)

8:00 am - 9:00 am  
**Plenary Session**  
(Regency Ballroom A, B, and C)

*Introduction:*
*Joan Ferrini-Mundy, Assistant Director, Directorate for Education and Human Resources, NSF*

*Plenary Speaker:*
*Leland Melvin, Associate Administrator for Education, NASA*

9:10 am - 10:25 am  
**Concurrent Workshops - Session III**  
(See handout for workshop locations.)

10:35 am - 11:50 am  
**Concurrent Workshops - Session IV**  
(See handout for workshop locations.)

12:00 pm - 12:45 pm  
**Closing Remarks**  
(Regency Ballroom A, B, and C)

*Shirley M. Malcom, Director, EHR, AAAS*

*Joan Prival, Noyce Lead Program Director, DUE, NSF*

12:45 pm  
**Conference Adjourns**

1:00 pm - 2:30 pm  
**Museum Tours for Scholars and Fellows (optional)**  
(Meet at the Regency Foyer Wall)
Joan Ferrini-Mundy, Assistant Director, Education and Human Resources, NSF

Joan Ferrini-Mundy is Assistant Director of the National Science Foundation (NSF) for Education and Human Resources, a position she has held since February 2011, and is responsible for the leadership of the NSF Directorate for Education and Human Resources (EHR). She had served the Foundation in a number of capacities since 2007, including as inaugural director (through an Intergovernmental Personnel Act appointment) of the EHR Directorate’s Division of Research on Learning in Formal and Informal Settings.

From 2007 through 2009, Ferrini-Mundy was a member of the National Science and Technology Council’s (NSTC) Subcommittee on Education, and currently co-chairs the Strategic Plan working group of the National Science and Technology Council Committee on STEM Education. She is a member of the Mathematics Expert Group of the Programme for International Student Assessment (PISA), and in 2007-2008, representing NSF, she served as an ex officio member of the President’s National Mathematics Advisory Panel, and co-chaired its Instructional Practices Task Group. From 1999-2011 Ferrini-Mundy held an appointment at Michigan State University (MSU), where she was a University Distinguished Professor of Mathematics Education in the Departments of Mathematics and Teacher Education, and Associate Dean for Science and Mathematics Education in the College of Natural Science. Her research interests include calculus teaching and learning, mathematics teacher learning, and mathematics and science education policy at the K-12 level. Ferrini-Mundy holds a Ph.D. in mathematics education from the University of New Hampshire. She was elected a fellow of the American Association for the Advancement of Science in 2011.

Yolanda S. George, Deputy Director, Education and Human Resources, AAAS

Yolanda Scott George is Deputy Director and Program Director, Education and Human Resources Programs, American Association for the Advancement of Science (AAAS). She has served as Director of Development, Association of Science-Technology Centers (ASTC), Washington, DC; Director, Professional Development Program, University of California, Berkeley, CA; and as a research biologist at Lawrence Livermore Laboratory, Livermore, California involved in cancer research and cell cycle studies using flow cytometer and cell sorters.

George conducts evaluations, workshops and reviews for the National Institutes of Health and National Science Foundation, as well as for private foundation and public agencies, including the European Commission. She develops and coordinates conferences and workshops related to STEM undergraduate reform and recruitment and retention of minorities, women, and persons with disabilities in STEM. She works with UNIFEM, UNESCO, L’Oreal USA and Paris and non-governmental organizations on gender, science, and technology initiatives related to college and university recruitment and retention and women leadership in STEM.

She currently serves as principal investigator (PI) or co-PI on several National Science Foundation (NSF) grants, including Vision and Change in Undergraduate Biology Education; National Science Education Digital Library (NSDL) Biological Sciences Pathways; Historically Black Colleges and Universities-Undergraduate Programs (HBCU-UP); Robert Noyce Teacher Scholarship Program; Transforming Undergraduate Education in STEM (TUES) and Virtual Faculty Workshop; and Women’s International Research Collaborations at Minority Serving Institutions. In addition, George is the lead AAAS staff person for the L’Oreal USA Fellowships for Women in Science Program (postdoctoral fellowships) and the David and Lucile Packard Foundation HBCU Graduate Scholars Program (graduate school fellowships).

George serves on a number of boards or committees, including: Maria Mitchell Women in Science Awards Committee; McNeil/Lehrer Productions Online Science Reports Advisory Committee; Burroughs Wellcome Fund, Science Enrichment Program Grants, Advisory Board; The HistoryMakers, ScienceMakers, Advisory Board; and the National Advisory Board of The American Physical Society Physics Bridge Program.

George has authored or co-authored over 50 papers, pamphlets, and hands-on science manuals. She received her B.S. and M.S. from Xavier University of Louisiana and Atlanta University in Georgia, respectively.

Shirley M. Malcom, Director, Education and Human Resources, AAAS

Shirley M. Malcom, Director for Education and Human Resources (EHR) Programs at AAAS, has served as a program officer in the NSF Science Education Directorate; an assistant professor of biology, University of North Carolina, Wilmington; and a high school science teacher. Malcom received her Ph.D. in Ecology from The Pennsylvania State University; Master’s in Zoology from the University of California, Los Angeles; and Bachelor’s with distinction in Zoology from the University of Washington. In addition, she holds 16 honorary degrees.

Malcom serves on several boards, including the Heinz Endowments and Public Agenda. She serves as a trustee of Caltech and
as a Regent of Morgan State University. In 2003, Malcom received the Public Welfare Medal of the National Academy of Science, the highest award granted by the Academy. She was a member of the National Science Board, the Policymaking body of NSF, from 1994 to 1998, and of the President's Committee of Advisors on Science and Technology from 1994 to 2001.

Leland D. Melvin, Associate Administrator, NASA

Leland D. Melvin, NASA associate administrator for education, is responsible for the development and implementation of the agency's education programs that strengthen student involvement and public awareness about its scientific goals and missions. In this role, he leads the agency in inspiring interest in science, technology, engineering and mathematics, or STEM, through NASA's unique mission, workforce, facilities, research and innovations. As associate administrator for education, Melvin chairs the Education Coordinating Committee, or ECC, an agency-wide collaborative structure that maximizes NASA's ability to manage and implement its education portfolio. The ECC works to ensure that the agency's education investments are focused on supporting the nation's education efforts to develop the skilled workforce necessary to achieve NASA's goals and objectives.

Melvin currently serves on the White House National Science and Technology Council's Committee on Science, Technology, Engineering and Mathematics Education, or CoSTEM. CoSTEM coordinates the STEM education activities and programs for all federal agencies, encourages the teaching of innovation and entrepreneurship as part of STEM education, reviews STEM education activities and programs to ensure they are not duplicative within the Federal government and develops and implements a five-year STEM education strategy for all federal agencies. He is the United States representative on the International Space Education Board, or ISEB, a global collaboration in space education between NASA, the Canadian Space Agency, the European Space Agency, the Japan Aerospace Exploration Agency and the Centre National d'Études Spatiales.

The ISEB shares best practices and units efforts to foster interest in space, science and technology among the student community worldwide. Melvin began his NASA career in 1989 as an aerospace research engineer at the agency's Langley Research Center in Hampton, VA. He entered NASA's astronaut corps in 1998 and served as a mission specialist operating the robotic arm on two space shuttle missions to the International Space Station: STS-122 in 2008 and STS-129 in 2009.

Melvin earned a Bachelor of Science degree in chemistry from the University of Richmond, where he also excelled as a wide receiver for the Spiders' football team. He became a National Collegiate Athletic Association Division I Academic All American and University of Richmond Athletic Hall of Fame Inductee. He was then drafted into the National Football League, or NFL, by the Detroit Lions in 1986 and also spent time with the Dallas Cowboys and the Toronto Argonauts. After injuries sidelined his football career, he returned to academia and earned his Master of Science degree in materials science engineering from the University of Virginia in Charlottesville. He holds honorary doctorates from Centre College, St Paul's College and Campbellsville University.

Susan Rundell Singer, Division Director, Division of Undergraduate Education, NSF

Susan Rundell Singer is Division Director in the Division of Undergraduate Education at NSF and Laurence McKinley Gould Professor, in the Biology and Cognitive Science Departments at Carleton. She pursues a career that integrates science and education. In addition to a Ph.D. in biology from Rensselaer, she completed a teacher certification program in New York State. A developmental biologist who studies flowering in legumes and also does research on learning in genomics, she is a AAAS fellow and received both the American Society of Plant Biology teaching award and Botanical Society of America Charles Bessey teaching award.

Singer directed Carleton's Perlman Center for Learning and Teaching, was an NSF program officer in Biology, and is a co-author of the Vision and Change in Undergraduate Biology report and an introductory biology text. She has served on numerous boards, including the NSF Education and Human Resources advisory committee, Biological Sciences Curriculum Study Board, and the Botanical Society board of directors; is a member-at-large for the AAAS Education Section; participates in the Minnesota Next Generation Science Standards team; and was a member of the National Academies' Board on Science Education. She has participated in six National Academies studies, including chairing the committees that authored America's Lab Report, Promising Practices in STEM Undergraduate Education and Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering.

Richard Steinberg, Professor, School of Education and the Department of Physics and Program Director of Science Education, City College of New York

Richard Steinberg is Professor in the School of Education and the Department of Physics and Program Director of Science
Education at City College of New York since 1999. He received a Ph.D. in applied physics and a secondary teaching certificate from the Teacher Preparation Program from Yale University. For more than 20 years his scholarship has been on research and development of physics / science education, innovative instruction, teacher education, and outreach to local schools. He has published dozens of books, refereed articles, and curricula and has received funding from the National Science Foundation, the Fund for the Improvement of Postsecondary Education, the National Academy of Education, and the Eisenhower Higher Education Professional Development Program. Topics have ranged from elementary school science to quantum mechanics; from curriculum development to teacher education. He is a former Spencer Postdoctoral Fellow and CCNY Teacher of the Year. During sabbatical in 2007-08, he was a full-time science teacher in a public high school in New York City.
Session I: Thursday, May 30, 2013
9:15am - 10:30am

1.1 This session includes two 30-minute presentations.

1.1A Developing Confident Elementary Science Teachers: Mentoring Strategies from Exemplary Teachers

Length of Session: 30 minutes

Linda T. Coats, Mississippi State University
Jianzhong Xu, Mississippi State University

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators

Topic: Supporting New Teachers

Mentoring is viewed as an important vehicle to connect experienced and beginning teachers to implement science education reform (Gustafson, Guilbert, & MacDonald, 2002; Hudson, Skamp, & Brooks, 2005; McGinnis, Parker, & Graeber, 2004). However, many programs focus on mentoring beginning elementary-school teachers without identifying links to a particular subject area (Gustafson et al., 2002; Loucks-Horsley, Hewson, Loves, & Stiles, 1998), whereas other studies have focused specifically on secondary rather than elementary science (Gustafson et al., 2002; Hudson et al., 2005). One of the goals that guided research conducted through the Worldviews of Exemplary African-American Science Teachers project (WEAST - NSF DRL-0732173) was to learn how exemplary African-American elementary science teachers translate their teaching characteristics into a mentoring program for beginning elementary science teachers. This presentation will explain these findings and offer practical mentoring strategies for beginning elementary science teachers.

1.1B The Importance of Mentoring: Perspectives of a Beginning Teacher

Length of Session: 30 minutes

Andre M. Green, University of South Alabama
Jeanell Calhoun, University of South Alabama, Former Noyce Student/Beginning Teacher

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Supporting New Teachers

Though there may be many reasons for teacher attrition and mobility, results from a recent survey conducted by the National Center for Educational Statistics suggest that an exceedingly high percentage of teachers who abandoned their careers may have entered the teaching profession under-prepared, overwhelmed, and under-supported, resulting in frustrated teachers who burned out after only a few years of teaching (Marvel, Lyter, Peltola, Stitzek, & Morton, 2006). To avoid this pitfall, the University of South Alabama’s Noyce Pathway to Science and Mathematics programs provides its graduates with school-based first-year mentoring to ensure that they are supported because we view the mentoring as critical in their further development as teachers. The perspectives of first-year teachers will be shared in this presentation.

1.2 This session includes two 30-minute presentations.

1.2A Western Regional Noyce Conference: Three Year Summary

Length of Session: 30 minutes

David M. Andrews, California State University, Fresno

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Evaluators/Education Researchers

Topic: Partnerships

This presentation will summarize the activities, events, and most importantly, the evaluation outcomes for the Western Regional Noyce Conference’s three-year project. The Western Regional Noyce Conference (WRNC), with NSF funding beginning in October 2009, consisted of three WRNC conferences (CSU Fresno, CSU Long Beach, and the University of Arizona) and involved numerous Noyce campuses from throughout the Western Region of the U.S. The presentation may be of value to others who have conducted regional conferences, are currently doing so, or who plan to do so in the future.

1.2B Broadening Capacity Through Pairing NOYCE Scholars with NSF Projects

Length of Session: 30 minutes

Joanne Caniglia, Kent State University

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Partnerships

The Kent State University's College of Education, Health, and Human Services is particularly well suited to address the needs
of future teachers through funding from the National Science Foundation (NSF) and the US Department of Education (DOE). In particular, funding is allocated for delivery of professional development to both in-service and pre-service educators. Among the current NSF programs are National Center for Science and Civic Engagement (SENCER), Institutions Developing Excellence in Academic Leadership (IDEAL), and the Noyce Scholarship Program. A four-year, DOE Mathematics and Science Partnership grant provides support for professional development. Until this year, each of the awards proceeded individually. During the 2012-2013 academic year, these four awards have found points of intersection and resources to support Noyce Scholars as they become teachers in high need schools.

This presentation will discuss the points of intersection among the Noyce, SENCER, MSP, and IDEAL projects and how they support future teachers. Each of the above mentioned awards are directed or co-directed by Noyce PIs Borgerding and Caniglia. This collaboration has enhanced the options and resources that Noyce Scholars have to engage in meaningful teaching of mathematics and science. The Model Courses that SENCER has produced for STEM undergraduate education are invaluable resources to Noyce Scholars. In a similar way, the IDEAL project provides Noyce Scholars with opportunities to mentor secondary students with STEM research projects while the MSP project has provided multiple entry points to urban schools.

1.3 This session includes two 30-minute presentations.

1.3A Working with At-Risk Youth at an Early College: An Innovative Teacher Preparation Model

Length of Session: 30 minutes

Lienne Medford, Clemson University

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

This session will highlight Early College, a public school in Greenville, SC, that targets at-risk students, particularly minorities and first generation college students, starting in grade 6. Students are chosen based on national test scores in the 20-40% and are then taught in small classes with a constant emphasis on going to college. The program is unique as three institutions of higher education are involved, providing on-campus tours and activities and a promise for a free ride to graduates if they meet admissions requirements. The school partners with the Clemson Noyce grant to provide placements for Noyce scholars that prepare them to work with Title 1 schools. The school is housed at the University Center of Greenville, providing additional opportunities for interaction and professional development for Early College teachers.

1.3B Going Online and Staying Connected to Urban K-12 Schools: The Strengths and Challenges of an Online Noyce Program

Length of Session: 30 minutes

Frederick W. Freking, University of Southern California

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The University of Southern California (USC) Robert Noyce Science Scholars Program has many levels of support. All Noyce Science Scholars are part of an online cohort of science teachers that learn together and support one another through two pedagogy courses and two guided practice placements. Our Scholars also participate in monthly synchronous meetings and have continual access to an asynchronous forum where they can share their struggles and victories as beginning science teachers.

To further support our USC Science Scholars, we have created an online Urban Science Teacher Network (USTN), also known as The Playground. Our USTN is the key vehicle to support our Scholars as they leave the MAT@USC and join the science teaching profession. Here, our Noyce scholars receive support, encouragement, and feedback as they analyze lesson plans, videos of instruction and student work. All USTN participants will also be able to hold their own synchronous online meetings, as well as post to the asynchronous forum. Since this is an online community, our Scholars will be able to participate wherever they choose to accept an urban science teaching position.

We also plan to use the USTN as a recruiting tool. Potential Noyce Science Scholars can participate in this professional science teaching community to determine if urban science teaching is the right career choice. Our presentation will share detailed examples of how our Noyce Scholars participate in K-12 science classrooms and online learning to become an urban science teacher.
1.4 This session includes two 30-minute presentations.

1.4A The UChicago Urban Teacher Education Program: 5 Years from Pre-Service through Induction

Length of Session: 30 minutes

Douglas O'Roark, University of Chicago

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

UChicago UTEP is an innovative urban teacher preparation program that prepares its students to teach mathematics or biology in underserved schools in Chicago. In two years, students earn a Master's degree, and graduates receive intensive induction support for their first three years of teaching. UTEP's noteworthy practices include a yearlong teaching residency supported by frequent residency seminar meetings; a three quarter seminar called “Soul Strand” in the program's first year, where issues of race, class, culture, privilege, and personal identity are addressed; a professional development program to develop “clinical instructors,” in-service teachers who are mentors to 2nd year teaching residents; the operation of a summer math and science camp for 6th to 12th graders living on Chicago's South Side, where inquiry and problem solving are emphasized and where staff, residents, and clinical instructors collaborate and reflect on their teaching practice; and inquiry groups for alums, clinical instructors, and other in-service teachers in our partner schools.

1.4B Project-based Instruction and Community Service

Length of Session: 30 minutes

Sandy Watson, University of TN at Chattanooga
Stephen Kuhn, University of TN at Chattanooga

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

A unique Project-based Instruction (PBI) course, part of UTeaChattanooga, a UTeach program, partnered with the Chattanooga Zoo and the Chattanooga Girls’ Leadership Academy (CGLA), an underprivileged girls’ charter school to perform community service for the Zoo. Noyce scholars created educational modules for the zoo exhibits and provided one-on-one tutoring in science for the CGLA girls at the zoo while engaging in their own self-designed investigations with the zoo animals. This semester-long project served as the students’ major project requirement for the PBI course. Come to our session and learn how to make project-based instruction come alive for your students while serving your community at the same time!

1.5 Noyce Regional Conferences: Lessons Learned and Best Practices

Length of Session: 60 minutes

Sheila R. Vaidya, Drexel University
Lisa Gonsalves, University of Massachusetts at Boston, Gregory Phelan, SUNY College at Cortland

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Sustainability

The Noyce regional conferences were designed and implemented to bring together regional communities of Noyce scholars, teachers and program personnel to share ideas and practices, inspire learning and solidify a regional and national “Noyce” identity. In a roundtable forum, PIs and Co-PIs who were leaders in running various regional conferences, namely (Northeast, Southeast and Midwest) will come together to answer questions, listen to suggestions and share learned lessons as well as the findings from evaluation data. Noyce conferences serve the purpose of building a community with members who take pride in working together to impact teaching and learning in high-need schools. Conference experiences likely sustain commitment and energize participants.

This session will be informative to those planning a Noyce conference or to those who wish to learn about the impact and value of the regional Noyce conferences or to provide ideas and suggestions for future Noyce conferences.

1.6 Three Innovative Noyce Program Components

Length of Session: 60 minutes

Jim Matthews, Siena College
Emily Casey, Siena College, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs,
The Noyce Mathematics and Science Teaching Scholarship Program at Siena is completing its second year. Thus far, Noyce has impacted our preparation of STEM teachers in several notable ways. First, we have greatly exposed our STEM teaching candidates to the challenges and rewards of working in high-needs schools. Second, we are significantly increasing the number of our mathematics graduates who will be qualified to teach computer science. Third, our Scholars have participated in an innovative field experience with the goal of implementing a highly successful school mathematics symposium. Eight pre-Noyce students stayed on campus after the spring 2012 semester ended. They participated in an intensive five-week program with course work and an 80-hour field experience at Schenectady High School. We will describe this program, the pre-Noyce scholars’ experiences, and the positive impact the program had on applications for scholarships. Our success with this programming bodes well for increasing the number of graduates pursuing teaching careers in high-needs schools and for increasing their ability to be successful in these schools.

At Siena we have a history of success producing secondary mathematics teachers. Our Noyce project requires our mathematics scholars to complete a strong minor in computer science (CS) so they are qualified to teach CS at the Advanced Placement level. In the 12 years prior to receiving our grant, we had only 4 out of 65 students take these CS courses despite being strongly advised to consider doing so. Each of our first two cohorts of scholars has exceeded the previous dozen years in this area. This success coincides with the “CS 10K Project” (supported by NSF) which has a goal of producing 10,000 CS teachers for the pre-college level by 2016. A third way we are preparing our Scholars for success in high-needs schools is by involving them in an innovative school mathematics project. The project goal was to have each middle school student work on a challenging mathematics problem over a two-month period and then produce a conference poster and presentation on that problem. The project culminated in a school mathematics symposium modeled after professional mathematics conferences.

Co-PIs, Other Faculty/Staff, School and District Administrators, Evaluators/Education Researchers
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

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Co-PIs, Other Faculty/Staff
Topic: Supporting New Teachers

This workshop will share facets of a continuing research and curriculum development project that focuses on the mathematical content knowledge of preservice secondary mathematics teachers (PSTs). The overall goal of the workshop is to demonstrate how a content course, when coupled with focused practice experiences, can help PSTs uncover gaps in their content knowledge and help them to critically self-evaluate their preparedness for teaching.

Inquiry-based curriculum modules were developed as part of the Learning Mathematics Through Teaching project (NSF #1141030). They form the foundation of a required capstone course and guide PSTs inquiry into precalculus topics by incorporating facets of the Common Core State Standards for Mathematical Practices (CCSSM, 2010). Research has suggested that PSTs are often unable to explicitly connect the advanced mathematical content they learn in college with the mathematical knowledge required for teaching (Zazkis & Leikin, 2010). These curriculum modules help PSTs make connections among precalculus topics, analytic geometry concepts, and algebraic structures.

Workshop participants will engage in the curriculum modules, working through the mathematics and providing feedback to the research team. Participants will react to the mathematical work of the PSTs study participants and will discuss mathematical understandings. The presenters will report PSTs’ beliefs about their preparedness for teaching and changes in those beliefs throughout the semester-long course. Data were collected in a series of five interviews with the participating PSTs. These data, together with pre- and post-tests, are analyzed regarding the PSTs’ mathematical understanding in relation to the curriculum modules and precalculus concepts.

1.8 Science Netlinks - An Incredible Resource for Teachers and Students...and It's Free

Length of Session: 60 minutes

Suzanne Thurston, AAAS

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators
Topic: Resources for Teachers

Did you know that AAAS provides FREE resources for K-12 educators and students? Did you know that you can go to one place and find lesson plans, podcasts, interactives, blog posts, mobile apps, and current science news? Science NetLinks, produced by
AAAS, is in its 16th year of developing science resources for use in the classroom. The award-winning website provides engaging, thoughtful, and dynamic resources that will enhance instruction in all disciplines of science. Come learn the basics of this incredible website, try out some of its resources, and let Science Net-Links support your teaching and student learning.

**1.9 Tapping the Potential of Struggling Mathematics Learners**

**Length of Session:** 60 minutes

Margaret Mohr-Schroeder, University of Kentucky  
D. Craig Schroeder, Fayette County Public Schools

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators  
**Topic:** Resources for Teachers

Have trouble reaching struggling mathematics students? In today’s classrooms, mathematical knowledge is not enough; teachers must find creative ways to unlock potential in their students. In this session, participants will engage in classroom ready, research-based strategies and hands-on activities to help tap the potential of students who struggle.

The use of "proven" research-based methods in teaching mathematics to students who are typically developing can be a challenging task. Yet, an even more demanding assignment can be teaching students who struggle. The objectives of this session are to: 1) share a variety of instructional strategies, 2) explain how the instructional strategies help students who struggle become College & Career Ready, and 3) have attendees engage in hands-on activities that highlight the instructional strategies.

**1.10 Innovative Practices and Teacher Preparation for “Re-Careering” STEM Professionals**

**Length of Session:** 75 minutes

Karen Nave, Rio Salado College  
Kimberly Tobey, Rio Salado College, Teacher Education Innovations and Initiatives, National Association of Community College Teacher Education Programs (NACCTEP)  
Thomas Hagen, Rio Salado College, Math Noyce Scholar  
Albert Dyke, Rio Salado College, Science and Math Noyce Scholar

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators  
**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

The workshop will focus on innovative strategies for and benefits of collaborative partnerships with industry, school districts, and "re-careering" STEM professionals. Focus will be given to outlining and discussing best practices associated with selecting qualified STEM professionals as future middle school and high school math and science educators, and utilizing creative recruiting and marketing tools along with designated pre-screening instruments such as the Haberman Star Pre-service Teacher Screening Aptitude Test and the Explore Teaching Workshop. Additional focus will be given to building partnerships with industry experts and formalizing recruitment efforts that benefit employees who are seeking to re-career or retire. These transitioning STEM professionals can then make a social impact and influence the next generation of math and science classroom students.

Noyce Scholars will present their experiences of transitioning, preparing, and training for the 7-12 grade math or science classrooms and will specifically discuss their overall preparedness for working with students from high-poverty, high-need school districts. The Noyce Scholars will share their stories of successful navigation through the Rio Salado College online hybrid Teacher Preparation coursework, including its enhanced focus on STEM, 150 hours of field experience, and student teaching, and support through its newly designed induction model for pre-service post-baccalaureate students. Additional time will be allocated for audience questions.

**1.11 Increasing the Potential of Physics and Chemistry Teachers through Formal and Informal Learning Experiences**

**Length of Session:** 60 minutes

Paige K. Evans, University of Houston  
Geoffrey Hart, Noyce Scholar - Physics

**Target Audience:** Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators  
**Topic:** Recruitment and Marketing Strategies

The teachHOUSTON and Robert Noyce Scholarship programs at the University of Houston are preparing highly qualified physics and chemistry teachers through formal and informal learning experiences. One of the greatest challenges is the recruitment of qualified candidates; however, with an effective plan in place, this program aims to produce 24 qualified physics/chemistry teachers. Various opportunities focused on early exposure of candidates to physics/chemistry teaching experiences have been utilized to recruit physics/chemistry majors and minors into the program. The program offers summer internships in the Exxon-Mobil Bernard Harris Summer Science Camp, a STEM program for underserved middle students, in which candidates are able to
work with science master teachers on development and implementation of science modules as well as serve as camp counselors. Coupled with this, candidates acquire early field-experiences through two introductory courses in the Teach-Houston program. For easy transitioning of the candidates into the Noyce Scholarship Program, innovative degree and certification plans which include both their major/minor and teacher certification courses were developed. To ensure that the Noyce scholars continue and complete the program, measures have been put in place. For example, scholars take a science as inquiry course, which increases their physics/chemistry content knowledge through inquiry-based teaching pedagogies. In subsequent semesters, additional field-based courses allow the scholars to teach innovative, inquiry-based lessons in high need schools. Currently there are 6 scholars in the program; one of the scholars will discuss how these aforementioned experiences have impacted his preparation and enthusiasm for teaching physics.

1.12 Making the Common Core Mathematics Standards Accessible for English Learners and Students Who Read Below Grade Level

Length of Session: 75 minutes

Karen Kuhel, Kennesaw State University
David Turk, Kennesaw State University, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Resources for Teachers

Effectively implementing the common core mathematics standards requires a significant shift in classroom planning and practice. Once you would hear that English learners could succeed in mathematics classes without strongly developed English language skills because it was a “universal language” or that mathematics was the least literacy dependent content area for students who read or wrote below grade-level. These are inaccurate claims that have finally been laid to rest with the increased content rigor of the common core standards and the requirement to integrate reading of informational texts and development of argumentative writing tasks into the mathematics curriculum.

This workshop will provide participants with specific knowledge, skills, and strategies to: a) develop language objectives that will inform teaching language and math content simultaneously; b) incorporate specific reading strategies into lesson delivery; and c) develop both general academic and content specific vocabulary within context. Participants will have hand-on opportunities to work with activities in Geometry, Algebra, and Calculus. In addition to resources used within the workshop, participants will receive a list of online resources and references.

1.13 GeoGebra for Secondary Mathematics Teachers

Length of Session: 75 minutes

Kellie Evans, California State University, Northridge

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

This hands-on, interactive workshop will provide an introduction to GeoGebra, which is free software for learning and teaching elementary through university level mathematics. Participants will interact with dynamic GeoGebra worksheets and learn how to create their own. Various GeoGebra basics that allow a teacher and students to experiment with and visualize K-12 mathematics will be covered. Along the way, participants will engage in some, and possibly all, of the Common Core Standards for Mathematical Practice. Participants are encouraged to bring their own laptops and, if they do, download GeoGebra in advance of the workshop via the link: http://geogebra.org/cms/. Experienced GeoGebra users are encouraged to bring their favorite activities for a show-and-tell toward the end of the workshop. Resources for learning more about GeoGebra will be provided.

1.14 Practicing Teacher Leadership for Middle School Science Using the Lenses of Student Thinking and the Science Content Storyline

Length of Session: 75 minutes

Paul Beardsley, California State Polytechnic University, Pomona
Julie Allender, Ontario-Montclair School District, Noyce Master Teacher
Eva Isett, Ontario-Montclair School District, Noyce Master Teacher
Elizabeth Mercado, Ontario-Montclair School

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Non-Profit Organization Personnel

Topic: Teacher Leadership

Science Teachers Learning from Lesson Analysis (STeLLA) is a video case-based approach to professional development that holds great promise as a program through which teachers can exhibit growth and leadership teaching science and mathemat-
ics. STeLLA is guided by a conceptual framework that focuses teachers’ attention on learning from analysis of practice using the Student Thinking Lens (strategies to reveal, support, and challenge student thinking) and the Science Content Storyline Lens (strategies to create coherent connections among lessons). Previous rigorous research, including a large scale, randomized controlled study, suggests this approach leads to strong gains in teacher knowledge and practice and, importantly, student understanding at the elementary level. In this workshop we will describe how we implemented STeLLA with teachers of middle school science in an urban, low SES area. Participants in the workshop will get an introduction to the two lenses and the lesson analysis cycle, with a special focus on asking questions (a part of the Student Thinking Lens). In small groups, workshop participants will watch a video of teachers teaching genetics and then conduct a small-scale lesson analysis, looking to identify teaching moves and questions to probe and challenge student thinking. Participants will then practice writing and acting out a script that involves teacher questions and exemplar student answers from low, medium, and high-performing students. Following the workshop, participants will have access to a model set of research-based genetics lessons that embed science practices from the Next Generation Science Standards.

**1.15 Engineering Isn’t Hard: Understanding What is Meant by the E in STEM**

*Length of Session: 60 minutes*

Sumter Link, University of South Carolina

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

More and more we are hearing that STEM is the future of education in our country. To educators, the science and math aspects of it are understood and very present in our schools. However, there is often confusion and a lack of understanding among science and math teachers about what is meant by the term “engineering” in K-12 education. This presentation is targeted toward teachers in the STEM areas who are not familiar with engineering. Participants will be involved in a discussion about what engineering is, how to understand it in the context of the subjects they teach, and how it can be easily integrated into the classroom. They will additionally engage in different activities that use engineering concepts within the framework of both science and math standards. The presentation will provide a clearer understanding of engineering for STEM teachers while showing the benefits of integrating engineering into a math or science classroom.

**Session 2: Thursday, May 30, 2013 3:00pm - 4:45pm**

**2.1 This session includes two 30-minute presentations.**

**2.1A Partnerships That Could Enhance Students’ Learning and Progress in an Urban Setting**

*Length of Session: 30 minutes*

Joshua Quansah, Lehman College

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Partnerships

Partnerships formed among parents and groups and institutions of interest to students go a long way to sustain the interest of young people. Partnerships could serve as enhancers and buffers to at risk students who have lost the excitement in the classroom. While student teaching at the Eagle Academy in the Bronx, NY, I learned the benefits and importance of partnership formed with higher institutions of learning, Mount Sinai College of Medicine, Montefiore’s College of Medicine Mentoring program and even collaborations with non-teaching staff. The positive effects that resulted will be discussed. In this interactive session, attendees will be invited to share individual experiences.

**2.1B Building Strong University-School District-Community Partnerships for Noyce Scholar Success**

*Length of Session: 30 minutes*

Kevin Carr, Pacific University

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators

Topic: Partnerships

Successful teachers in high-needs schools are often deeply engaged not only in the classrooms in which they teach, but in the neighborhoods and communities in which their students live. How might Noyce teacher preparation programs prepare Scholars to become engaged leaders in both high-needs schools and their surrounding communities? This session will
focus on the Woodburn Community STEM Teacher Preparation (WCSTP) program, a Noyce Scholarship program embedded in a high needs community. WCSTP partners currently include Pacific University, Woodburn School District, the local community college, public library, City Public Works Department, local Watershed Council, and the Capaces Latino Leadership Institute. We will describe the steps taken to build WCSTP over the course of our Noyce project, and discuss how Noyce Scholars interact with the community during their Noyce preparation program. The discussion will be grounded in the National Association of Professional Development Schools “Nine Required Essentials” (http://www.napds.org/nine_essen.html), which provide tangible benchmarks for assessing the strength of teacher preparation partnerships. Session participants will leave with 1) a greater sense of partnership possibilities, 2) awareness of specific barriers to partnership that exist in their own institutions and settings, and 3) actionable partnership goals to work toward in their own Noyce projects.

2.2 This session includes two 30-minute presentations.

2.2A Reflective Teacher Leaders and Action Research

Length of Session: 30 minutes

Leah McCoy, Wake Forest University
Caitlin Boone, Wake Forest University, Noyce Scholar
Allison Mousel, Wake Forest University, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Action research is a required component of our program. We believe that the action research process is important in developing habits of reflective teaching and teacher leadership. An action research project is a required component of our program. Early in the program, each Noyce scholar chooses a pedagogical strategy of interest and completes a literature review of research related to this strategy. They then plan and implement the strategy in the student teaching internship. As part of the capstone course, they analyze narrative and quantitative data and reflect on the success of the strategy in their pedagogical practice. As a follow-up, graduates are then surveyed to determine whether this action research experience has an effect on their early years of teaching. Evidence is sought to describe the impact of the teaching strategy, as well as the impact of the action research process in developing a reflective attitude toward teaching and teacher leadership skills.

Two current action research studies will be discussed. The first study sought to investigate the impact of problem-based learning on high school students’ attitudes toward mathematics and self-efficacy beliefs in mathematics. The second study investigated the effect of flipping the classroom on student attitudes, beliefs of competency, and achievement in high school mathematics.

Additionally, data will be shared on reports of our graduates in their first and second year of teaching on the impact of their action research projects on their teaching practice and teacher leadership.

2.2B Teaching Together: Teaching Fellows and Master Teaching Fellows Co-Teach in Middle School and High School Mathematics Classrooms

Length of Session: 30 minutes

Ruth Yopp-Edwards, California State University, Fullerton
Martin Bonsangue, California State University, Fullerton

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The CSU Fullerton Mathematics Teacher and Master Teacher Fellows Project adopted a co-teaching model of student teaching in its preparation of Teaching Fellows. Unlike a traditional student teaching model in which the teacher candidate observes the master teacher and gradually assumes responsibility for the class, in a co-teaching model the candidate and master teacher co-plan and co-teach throughout their time together. Master Teaching Fellows and their Teaching Fellow partners were trained in seven co-teaching strategies during the summer preceding the student teaching experience, and ongoing support was provided via monthly mentoring meetings with the Master Teaching Fellows and online discussions, information, and links to videos.

The presenters will briefly explain the co-teaching strategies and training activities and share feedback they have received over the past two years from the Master Teaching Fellows and Teaching Fellows—including several who are now completing their first year of teaching—regarding this model. The teachers report varying degrees of success and satisfaction with co-teaching and the seven co-teaching strategies and these data will be explored. Insights will be shared by program leaders as well as a MTF-TF team.
2.3 This session includes two 30-minute presentations.

2.3A A Quantitative and Qualitative Analysis of Physics and Chemistry Accessibility in High Needs Schools

Length of Session: 30 minutes

Keith Sheppard, Stony Brook University
Angela Kelly, Stony Brook University

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Research and Evaluation

Physics and Chemistry course availability is often limited in high needs schools and consequently presents the opportunity for Noyce Scholars to advocate for greater accessibility for their students to take physical science classes. Research in schools with high and low Physics and Chemistry enrollments has shed light on some of the complexities of advanced science course taking. This workshop explores this issue in three ways. First, we describe the disparities in science enrollment and performance across New York schools using New York State’s Education Department Report Card data. Second, we present qualitative data from interviews and site visits of schools to examine the issues that tend to curtail physical science participation. School administrators and teachers shared their perspectives on how they made decisions related to course offerings and enrollment, as well as the reasons why they believe students take Physics and Chemistry. Third, we discuss how some teachers in the schools have acted as champions for change in encouraging greater access to the physical sciences. These science teachers may serve as models for localized action to combat persistent social inequities in the physical sciences.

2.3B Towards a Greater Understanding of What it Means To be Committed To Teaching in a High-need School

Length of Session: 30 minutes

Paul Bischoff, SUNY-Oneonta

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Research and Evaluation

When we were awarded the Noyce Grant in 2009, we immediately began an aggressive recruitment campaign focused on attracting top-notch high school seniors and freshman undergraduates in science and science education to commit to a scholarship program that would eventually require them to teach for 4-years in a high needs school. An interesting question is “Does an 18-year-old have any real understanding of what it means to be committed to teaching science in a high need school?” Likewise, an essential follow up question is “Does participation in a Noyce Scholars program characterized by intense rural and urban clinical teaching experiences lead to a more informed and professionally mature sense of knowing what it means "to be committed to teaching science in a high-needs school?” The purpose of this research is to describe how Noyce Scholars’ understandings of what it means “to be committed to teaching science in a high-needs school” matures during their 4-years as an Undergraduate Science Education-Noyce Scholar at SUNY-Oneonta.

To gain access to our Noyce Scholars maturing understandings of what it means to “be committed to teaching science in a high needs school,” all Noyce Scholars (n = 25) were required to respond to the following prompt as part of a more comprehensive electronic survey: “Think about your Noyce program application essay (which we have provided to you). What do you think about now when you envision yourself as a science teacher in a high-needs school?” These 250 word essays were qualitatively analyzed in parallel with a similar essay written on their Noyce Scholarship Application. The results show a remarkable shift in thinking about what it means "to be committed to teaching in a high-needs school" from what can be characterized as "shallow, vague or naive notions towards a much more mature, experienced based, comprehensive understanding." Our clinical experiences, particularly those in New York City, coupled with numerous extra curricula and even social Noyce Scholars program events are seen as the factors driving their more mature sense of what it means "to be committed to teaching science in a high-needs school."

2.4 Recruiting Community College Transfers through Noyce Summer Internships

Length of Session: 60 minutes

Arlene Russell, University of California, Los Angeles
Jody Priselac, University of California, Los Angeles

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Recruitment and Marketing Strategies

Shortly after STEM community college transfer students have submitted their Intention to Register at UCLA, Senior Dean and
Dean of Physical Sciences, Joseph Rudnick, who is the PI of our Noyce grant, sends a letter to each student at their home address, inviting them to participate in a Noyce Summer Internship held the week before they begin classes in the fall. This welcoming letter serves to situate teaching as an important and valued STEM career even before they come to campus. We have found that many of these students also value teaching and know the importance of teachers: applications far exceed our capacity!

The weeklong internship in a high-needs school with a math or science teacher who graduated from the UCLA nationally acclaimed teacher education program is transformative. Ninety-five percent of the students indicate they are more interested in a teaching career after the internship; 100% say the experience was worth their time. A significant fraction of the students continue with other teaching internships during the academic year, but the curricular demands of STEM majors often precludes this. We are gratified that others return as graduating seniors to seek information about credential programs, but worry we have not been supporting them in the interim. We look forward to suggestions and ideas from our audience on what others are doing to involve and retain students in Noyce or Noyce-like programs after their summer internships.

2.5 Initiating Teacher Induction

Length of Session: 60 minutes

Gina Eaton-Harris, Cleveland State University-CSUteach

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Supporting New Teachers

CSUteach is an innovative teacher preparation program focused on providing 7-12 licensure in STEM content areas. CSUteach graduates continue to receive personalized induction support throughout their first years in the classroom. We begin with a ceremony that honors their achievement and officially "inducts" them into the profession. In an effort to accommodate the varied needs of our novice teachers, CSUteach provides a graduate elective course offered in a hybrid format.

This course is designed to support first-year teachers as they navigate the transition between their teacher preparation program and the school system where they are teaching. Instruction emphasizes classroom management, communication, record keeping, instructional planning and delivery, student engagement, time management, assessment and additional Ohio Residency Educator support. Formal and informal classroom visits are coordinated between the Induction Coordinator and novice teachers.

In this workshop, details of the intricate support extended to the transitioning graduates will be shared. Participants will be guided through a lesson study protocol, an activity performed with new teachers, to examine the alignment of standards and assessments.

2.6 The Teacher Induction Network: Providing Continued Support to Teachers During Their First Years of Teaching

Length of Session: 60 minutes

Gillian Roehrig, University of Minnesota
Barbara Billington, University of Minnesota

Target Audience: Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Supporting New Teachers

The Teacher Induction Network (TIN) is an on-line mentoring program for licensure completers in secondary science and mathematics. TIN incorporates reflective journals, topical discussion threads and professional development inquiries that provide a space for beginning teachers to continue to develop as educators. Until recently, developers of online mentoring programs have used lesson plans as a proxy for direct observations of classroom practice. However, recent developments in video annotation methods and tools make the use of video for examining and improving reflective practices increasingly viable within online environments. Through the strategic development and use of video annotation tools within TIN, our beginning teachers’ reflections on their classroom teaching are linked directly to evidence through video as documentation. The integration of VideoAnt into TIN represents a promising practice that promotes the development of reflective practitioners and provides a free and user-friendly on-line platform for sharing and providing feedback on classroom teaching.

In addition to sharing the structure and components of TIN, this workshop will discuss our research associated with the development of reflective practice through the use of video annotation within the online environment. Our analysis drew on a modified Learning to Notice Framework (van Es and Sherin, 2002) that proposes that the skill of noticing for teaching consists of two phases (describing and analyzing). Our analysis used four reflective stances: describing, explaining, evaluating, and interpreting. Through the use of video annotation, many teachers were able to develop higher level reflective stances of evaluation and interpretation.
2.7 A Project Based Approach to Implementing the Next Generation Science Standards

Length of Session: 60 minutes

Erich W. Eifler, Middleton Cross Plains School District
Michael E. Beeth, University of Wisconsin Oshkosh

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators, Non-Profit Organization Personnel

Topic: Resources for Teachers

The Next Generation Science Standards (NGSS) provide a road map for learning science and engineering practices. Among these practices, students are to develop skills and abilities to plan and carry out investigations, and to address problems that have real-world implications. What these standards might look like in a classroom remains an open question (Bybee, 2013).

Erich Eifler, a teacher in the Middleton/Cross Plains School District, and Michael Beeth, a Professor at the University of Wisconsin Oshkosh, will discuss the merits of a Project-based Learning approach that is addressing science and engineering practices in the NGSS. Erich’s teaching is guided by the idea that science and engineering practices are supported by access to-and guided application of--basic Do It Yourself tools and skills. Erich approaches teaching from an academic background in science and a professional background in youth-work and carpentry. He spent several years teaching at risk students to construct houses, which has informed his belief that exposure to tools is an important means for students to develop the learning cycles that underlie many of the standards. Michael Beeth comes from 10 years as a high school Biology and Chemistry teacher and is now spearheading an innovative teacher preparation program for individuals with degrees and work experience in math or science fields. This teacher preparation program encourages individuals like Erich to incorporate their understandings of how science and engineering are used in the real world to create authentic learning experiences for students.

2.8 Algebraic Thinking Through the Grades: Focus on Structure

Length of Session: 75 minutes

Davida Fischman, CSU San Bernardino
Jennifer Lewis, Wayne State University

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff

Topic: Resources for Teachers

Too often students see an algebra course as disconnected from everything they learned previously in mathematics. They see mathematics teachers as magicians who “just know” how to do things, and we hear questions such as “How did you get that equation?” and “How did you know what to do to solve it?” In order for our students to succeed in algebra and in courses that build upon it, it is up to us to help them understand how algebraic thinking permeates much of the content they have already studied, and to see algebra as an extension and generalization of arithmetic.

One of the major strengths of the Common Core State Standards -Mathematics (CCSS-M) is their focus on structure. Mathematical coherence through topics and grades is both at the foundation of the standards and made explicit in supporting CCSS-M documents. In this session we will examine some of the ways in which algebra flows from arithmetic, see connections to other mathematical areas, and investigate how we can help our students develop a deep understanding of algebra that will constitute the foundation for more advanced mathematics learning. We will engage teachers and teacher leaders in a number of mathematical tasks for students and for teachers that underscore the algebraic structure of mathematics in ways that are both familiar and challenging through a combination of content and practice standards.

2.9 Using Mathematical Discourse Practices to Promote Equity

Length of Session: 60 minutes

Rick Barlow, University of California, Santa Cruz

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

Mathematical discourse practices are not just vocabulary. Instead, discourse practices are the verbal and written tools (words, phrases, descriptions, gestures, drawings) students use to access the lesson content. This workshop will introduce educators to strategies that promote mathematical discourse practices in their classroom. Educators will also discuss their own strategies for promoting mathematical discourse practices in both large and small group discussion activities. What’s more, educators will develop an algebra problem that promotes discourse practices, thus providing an introduction on how to turn a typical textbook problem into a problem that promotes rich mathematical discussions.

This workshop will provide teachers tools they can use to develop students’ mathematical discourse practices. And as students’ develop the ability to precisely talk about the math they are doing, the students’ will be more likely to meaningfully engage in the lesson content.
2.10 Metacognition for Students: Helping Students Understand Their Own Learning by Self-Testing, While Also Teaching about Experimental Design, Controls, and Sources of Error

Length of Session: 75 minutes

Paul D. Heideman, College of William and Mary

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Resources for Teachers

Metacognition, thinking about one's own thinking and learning, can improve learning skills. An important step in improving learning skills can be development of self-testing skills for alternative approaches to learning and studying. Students who actively self-assess the effectiveness and efficiency of their study methods may gain concrete reasons to change. A challenge for teachers is how to help students learn to self-assess their own learning. This workshop from a Noyce add-on class ("How Students Learn") includes hands-on (more accurately, "minds-on") activities related to (1) students (first-semester freshmen) who designed and conducted experiments on their own learning as individuals, and (2) Noyce Scholars who designed and conducted an experiment on their own learning as a group. For example, freshmen designed experiments to test whether the amount they had slept affected their ability to solve problems, using a simple mental task (mental math) to assess problem-solving. Noyce Scholars designed and conducted an experiment on whether drawing-to-learn affected the accuracy and speed of learning new information (the Cyrillic alphabet). One outcome was that participants developed greater facility with experimental design, treatment controls, and sources of experimenter bias or experimental error. Noyce Scholars developed interest and confidence in working with high school students to help students self-assess their own learning. The workshop will include instructions and examples. During the workshop, participants will carry out portions of student-designed experiments and will also help develop and carry out a sample experiment.

2.11 Teaching with Cooperative Learning

Length of Session: 60 minutes

Michelle Romero, ASU STARR Noyce

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Resources for Teachers

Imagine a classroom with 100% of your students engaged in their learning. This session will focus on developing teacher's skills in actively engaging all students in a classroom. Participants will learn strategies that make learning mandatory for all and help students participate in meaningful dialog among other interdependent group skills.

2.12 An A-Z Guide for Developing and Implementing a Successful Noyce Scholarship Program

Length of Session: 60 minutes

Viji K. Sundar, California State University, Stanislaus
Tara D. Ribeiro, California State University, Stanislaus

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Innovative Program Practices, Supporting Scholars & Project Management

In this workshop the leadership team of the California State University, Stanislaus Robert Noyce Scholarship Program will cover all areas of program development and execution. It will be an A to Z guide for Noyce Directors and Administrative Personnel, encompassing all facets of program implementation and functioning. The presenters will navigate you through some of the roadblocks that most awardees encounter in the successful implementation of the program.

The workshop will focus on:
- Assembling Program Coordinating Team
- Scholarship Eligibility Criteria and Application Development
- Advertising Noyce Scholarship to Prospective Candidates
- Application Review Process & Recipient Selection
- Recipient Contracts’ Scholar Expectations
- Scholar Orientation/ Annual Noyce Academy
- Required Scholar Activities and Professional Development
- Non-Completers
- Project Poster
- Program Evaluation
- Program Reporting

2.13 Science and Social Justice: Promoting Authentic Projects in Secondary Classrooms

Length of Session: 75 minutes

Regina Toolin, University of Vermont
Beth White, University of Vermont, Noyce Graduate Research Fellow

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs,
Participants will engage in a dynamic exchange of ideas and concepts that apply the principles of project-based inquiry (PBI) to STEM-related issues and questions in today's society. Together we will facilitate an interactive discussion of PBI principles as we examine a variety of critical problems (i.e. climate change, GMOs, green spaces, and urban/rural environmental issues) that impact the lives of secondary students. Participants will explore a PBI curriculum template and begin to draft a project design about ideas and questions that they may explore with their own students. The workshop will culminate in an open discussion about issues and limitations of PBI development and implementation, time for exploring resources, and additional ways to apply PBI in grades 7-12.

2.14 This session includes two 30-minute presentations.

2.14A Managing Large Sets of Data in a Phase II Project

Length of Session: 30 minutes
Janice B. Fournillier, Georgia State University
Christine D. Thomas, Georgia State University

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Evaluators/Education Researchers
Topic: Project Management

In this session we share techniques for managing large sets of data in the monitoring and evaluation of a Phase II project. The Robert Noyce Urban Mathematics Educator Program at Georgia State University developed and executed a virtual learning environment (VLE) for the purpose of fostering effective mathematics teaching and in promoting retention of high performing teachers in urban high need schools. Over a two-year period, the VLE, known as Second Life, was the main meeting place for our community of Noyce Scholar. These VLE meetings were synchronous. Additionally, the scholars participated in asynchronous threaded discussions through a Google Group and used a Wiki to post and share resources. Data were collected in the form of video recordings of the VLE meetings, threaded discussions from the Google Group, artifacts from the Wiki, interviews with scholars, a variety of surveys, and video and audio recordings from face-to-face meetings. The process for storing and managing voluminous data in an electronic format will be shared.

2.14B Bringing Primary Scientific Literature into the Classroom

Length of Session: 30 minutes
Melissa McCartney, AAAS/Science
Pamela J. Hines, AAAS/Science
Bruce Alberts, AAAS/Science

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers

"Science in the Classroom" (http://scienceintheclassroom.org) is a collection of annotated research papers and accompanying teaching materials designed to help students at the advanced high school, community college, and undergraduate level understand the structure and workings of professional scientific research. Each annotated Science paper contains a "Learning Lens," which is used to selectively highlight and explain original text of the research article. An interactive glossary is included. Additionally, an educational scaffold containing an expanded explanation of the figures, often with a close-up of the relevant section of the figure itself, has been built into each research paper. Also accompanying the papers are discussion questions, additional activities, connections to the English Language Arts Standards and the 8 Practices of the Next Generation Science Standards, and raw data provided by the authors. We will present a tutorial on how to use this resource in a classroom and would appreciate feedback from the audience on how we can continue to make an expanded "Science in the Classroom" website a valuable resource for science teachers.

2.15 HiGHPad: Transforming Math with iPad

Length of Session: 60 minutes
Brittany Cuff, University of Southern California, Math for America

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

iPads are infiltrating classes all around the world. Many teachers and classrooms are getting these devices without the proper professional development to implement them effectively. This session will demonstrate to teachers how students can use iPads to drag, manipulate and animate mathematical shapes and equations, allowing them to visualize and further develop their understanding of fundamental concepts. As teachers begin to
transition from state standards to common core, they will simultaneously learn to transition into this digital medium. In this session, I will model the common core mathematical practices by demonstrating specific iPad® lessons I have done in my class along with a class set of iPads®. For instance, Geometry students use a clinometer app in order to solve for the height of a tall object on campus using trigonometry. They then present their findings in the app Doodle Buddy where they are able to annotate images and show problem workings.

I will also demonstrate the app Nearpod, which turns a standard direct instruction lesson into an interactive experience in which students are able to completely engage and interact with the material.

Session 3: Friday, May 31, 2013
9:10am - 10:25am

3.1 How and Why STEM Educators Need to Be Using Twitter

**Length of Session: 30 minutes**

Jeffrey Carpenter, Elon University

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Resources for Teachers

Think Twitter is about narcissism and celebrity stalking? Think again. Twitter is emerging as a new tool for teacher professional development (PD), as well as for teaching and learning activities. In this workshop, participants will learn why and how they can utilize Twitter to enrich their learning and that of their students. As a professional development tool, Twitter offers several potential benefits for STEM educators. It connects educators with similar interests; allows teachers dialogue with experts who previously would have been less accessible; and provides an efficient way to find and share resources. Regularly scheduled Twitter chat topics, such as #stemchat, give educators dynamic discussion spaces that include a broad range of perspectives.

Twitter also provides autonomy and allows educators to personalize their PD. In contrast to frequent negativity and cynicism regarding traditional PD, Twitter is generally a positive, solutions-focused environment for innovative educators seeking to improve their craft. Just as Twitter can facilitate positive learning experiences for STEM educators, students can also benefit. It can serve as a backchannel to facilitate discussion and questioning during lessons. Twitter can increase peer-to-peer and student-teacher interactions by extending the classroom discussion space. Students can find and share resources that become part of class content. Twitter provides students a larger audience for sharing of their own ideas, and can empower students to feel they are taking part in larger disciplinary conversations. In sum, Twitter is a tool that can facilitate timely and differentiated learning for both STEM students and teachers.

3.2 This session includes two 30-minute presentations.

3.2A Preparing Teachers Through Learning Assistants

**Length of Session: 30 minutes**

David R. Erickson, University of Montana
Maddey Frey, University of Montana
Megan Sutherland, University of Montana

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Noyce Scholars will share their experiences from serving this year as learning assistants in college mathematics and science classrooms. We will define this role from actual experiences and then look forward to the second year when we take the model into the secondary schools and help classroom teachers learn to use the model of slightly older students mentoring/assisting younger students in learning specific content. Examples will be shared that allow participants to understand how they too could implement this model in schools.

3.2B Knowing What to Expect before I Commit: Perspective of Noyce Scholars

**Length of Session: 30 minutes**

Andre M. Green, University of South Alabama
Kelsey Hinkel, University of South Alabama, Noyce Math Scholar
Amanda Schoen, University of South Alabama, Noyce Science Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Noyce Pathway to Science and Mathematics programs at the University of South Alabama requires all candidates interested in becoming Noyce scholars to complete a ten-week (2
days per week) internship. The program pairs the interested candidates with a mentor teacher identified by the partner school district as being a great teacher in a high need school. Students are required to complete a set of activities designed by the mentor teachers during the internship experience. At the end of the experience, candidates interview before a selection committee of high need school principals, the science supervisor of the district, and the principal investigators of the grant. The committee then selects the Noyce scholars. The experience from the perspective of the Noyce Scholar will be discussed.

3.3 This session includes two 30-minute presentations.

3.3A How Kennesaw State University’s Multifaceted Approach to Recruitment Can Be Replicated in Diverse Environments

*Length of Session:* 30 minutes

Nancy Overley, Kennesaw State University

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Recruitment and Marketing Strategies

This workshop will begin with an analysis of the progression of 6 years of our marketing/advertising and recruiting efforts for our Master of Arts in Teaching and our Noyce I and Noyce II programs. After a brief discussion of the research and development of our plan and materials, implementation, and results, we will then discuss changes over time and how our ongoing analysis has affected our current and future efforts. The remainder of the session (and primary emphasis of the workshop) will focus on how our multifaceted approach to recruitment can be replicated in diverse environments with a discussion on how grant fellowships and stipends can be allocated to recruit more highly-qualified applicants. Recruitment materials, news articles, etc. will be available for the participants to review.

3.3B Recruiting Engineering and Physics Students for Noyce Teacher Scholarship

*Length of Session:* 30 minutes

Evelyn Laffey, Rutgers School of Engineering

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff

Topic: Recruitment and Marketing Strategies

The goals of the STEM for Education Scholarship Program (STEM-ESP) at Rutgers University are to recruit, retain, and graduate a community of engineers and physicists who are dedicated to teaching physics, mathematics and engineering in high-needs, K-12 school districts. With an overarching theme of “STEM for Humanity,” the project enhances Rutgers’ existing programs by blending the physics and engineering undergraduate programs with the existing graduate teacher preparation programs, strengthening the focus on teaching physics and mathematics to students in high-needs districts, and infusing these programs with seminars that illustrate the great impact STEM has on society. The purpose of the session is to share our approach on recruiting engineering and physics undergraduates into STEM-ESP. We have partnered with various university departments and centers to recruit candidates, as well as interns. In continuing our partnership, we collaborate with the same departments and centers to provide early teaching opportunities to STEM-ESP scholars. In our first year, we received 8 applications from engineering students and 2 from physics majors. In our second year, we received 6 applications from engineering students and 4 from physics majors. Preliminary findings from initial interviews on why scholars accepted admission into STEM-ESP will also be presented.

3.4 Pedagogical Context Knowledge: What Truly Matters

*Length of Session:* 60 minutes

Audrey A. Friedman, Boston College

Phillip Pietrangelo, Dimon Regional High School, Fall River, MA, Noyce Scholar

Bernard (Ben) David, Seed Charter School, Washington, D.C., Noyce Scholar

Jianan Shi, Brighton High School, Boston, MA, Noyce Scholar

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Supporting New Teachers

The overall research question that informed this investigation is: To what degree do Noyce Scholars perceive that the preparation required by the grant provided the appropriate subject matter, pedagogical content, and pedagogical knowledge to teach science effectively in urban settings? Three cohorts of Noyce Scholars (n=13) participated in 1-2 hour interviews that addressed the strengths and weaknesses of their preparation for teaching science in secondary urban public schools.

Additional data included field notes from conversations, which occurred during the Graduate Inquiry Seminar and classroom observations. Results indicated that all Scholars 1) felt prepared in subject matter knowledge due to strong undergraduate preparation and completion of two graduate courses in their subject matter area as part of the Program of Study for the
M.Ed. in Science Education; 2) valued the Science Methods and Graduate Inquiry courses and university supervisors (former science teachers) as critical resources for sharing ways to think about and teach the discipline and to develop an inquiry stance; 3) appreciated the opportunity to conduct classroom-based research to focus on specific concerns, dilemmas, and questions in their teaching, to gather evidence, to pose, implement, and evaluate solutions, and to reflect critically about practice; and 4) believed that preparation enabled a lived mission of teaching and acting for social justice.

The 5th, most critical result, is a need for stronger preparation in pedagogical context knowledge: dealing with behavioral issues in inclusive settings, navigating the political context of the school, working with ineffective or effective leadership, and developing a more positive and culturally sensitive school culture.

### 3.5 Building Noyce Partnerships: Doing Together What We Cannot Do Alone

**Length of Session: 60 minutes**

Victor Donnay, Philadelphia Regional Noyce Partnership  
Greer Richardson, Philadelphia Regional Noyce Partnership

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers  
**Topic:** Partnerships

This workshop will explore the work of a multi-institutional partnership related to STEM teacher preparation and support. This partnership endeavors to build connections and share resources with the goal of strengthening all aspects of the STEM teacher career pipeline. Six Philadelphia area colleges and universities and one non-profit organization comprise the Philadelphia Regional Noyce Partnership. These institutions provide a range of Noyce programs including pre-service, in-service and master teacher components. Working together over the past two years, the partners have built synergies that both enhance the partnership and strengthen their individual programs, with a forward focus of being part of a systemic change in teacher quality and retention in the Philadelphia area. Come to this workshop not only to hear how these groups are facing their challenges and creating opportunities to do together what they cannot do alone, but also to spend time thinking about your own institution and how it might benefit from a partnership-oriented approach.

### 3.6 Motivating Urban Minority Students Through Error Analysis: An Action Research Study

**Length of Session:** 60 minutes

Serigne M. Gningue, Lehman College/CUNY  
Julissa Soriano, Lehman College, Noyce Scholar  
Gaoyin Qian, Lehman College

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators  
**Topic:** Supporting New Teachers

Effective urban teachers have recognized that improving student achievement is not easy (Stotko, Ingram, & Beaty-O’Ferrall, 2007), particularly during their first year when the integration of classroom management and sound instruction can be a difficult task (Kagan, 1992). This could not be so true for one Noyce novice teacher who faced tremendous challenges during her first year in the classroom. She showed resilience in shifting her routines to address not only the cognitively related learning issues she faced, but also the associated socioeconomic problems. Her solutions and novel strategies for assessing learning improved her teaching and student performance and motivation, and strengthened her self-efficacy and resilience to face the issues.

In this session, we will describe how she used the strategy of “Student Error Analysis” (SSEA) to lead her students to believe in the “power of incorrect answers,” get them more engaged and increase their motivation to learn mathematics. Through this process, students discover their errors, use trial and error, reasoning, and questioning other students’ reasoning, allowing the classroom to become a stage for mathematical discourse and student-centered instruction. Using pre- and post data from a survey on mathematics attitude and a sample of integrated algebra questions and of Common Core State Standards derived set of performance tasks, we will also present results of an action research study that sought to determine the extent to which SEA improves 9th grade students’ attitude toward and performance in mathematics. Implications for mathematics instruction in urban schools will be drawn.

### 3.7 The Math for America San Diego Noyce Program: Creating Holistic Problems to Enrich the Common Core Standards

**Length of Session:** 75 minutes

Ovie Soto, Math for America, San Diego  
Brian Shay, Canyon Crest Academy  
Genevieve Esconde, Math For America, San Diego, Master Teaching Fellow  
Scott Frazier, Math for America, Teaching Fellow
Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff
Topic: Resources for Teachers

The Math for America San Diego (MfA SD) Noyce Program includes a focused and comprehensive program of professional support where participants create rich mathematical content. Program leaders Ovie Soto and Brian Shay, along with two MfA SD Noyce Fellows, will introduce attendees to holistic problems, demonstrate their ability to support the Common Core Standards’ eight mathematical practices, and discuss the implementation of holistic problems. Attendees will be given the opportunity to create their own holistic problems and learn strategies to turn any problem into a holistic one.

Attendees will be given resources including a set of holistic problems. The notion of the holistic problem is part of a conceptual framework, called DNR-based instruction in mathematics. For information about DNR and a collection of holistic problems and related DNR-based projects go to http://www.math.ucsd.edu/~harel and click “Projects.”

3.8 TAMU STEM Teacher Preparation Academy

Length of Session: 60 minutes

Timothy P. Scott, Texas A&M University
Nolan DeMent, Texas A&M University, Noyce Scholar and STEM Academy Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Educator preparation programs currently train teachers responsible for educating the most digitally savvy, socially networked generation in history. Today’s K-12 students have a clear vision of what a 21st century education should provide. They want an education that connects all aspects of their life; social, educational, and technological. Our culture now expects information, gratification, and satisfaction to be immediately available and teachers must be able to function and thrive in this dynamic environment. High school students regularly participate in online communities that offer a wealth of learning resources, many of which extend far beyond the bounds of schools.

The aggieTEACH Program, at Texas A&M University, constructed the STEM Teacher Preparation Academy to better equip secondary mathematics and science pre-service teachers with the skills necessary to teach in the 21st century classroom. Through a scholarship program, the Academy trains participants on effective ways of implementing cutting edge technologies so student engagement and achievement is positively impacted. Forty-six TAMU Scholars and 25 mentor teachers participate in Learning Academy Seminars that infuse current technology into the curriculum and emphasize the integration of mathematical and science content.

A mobile Teaching and Learning Lab (TLL) serves as a mock 21st Century classroom. The TLL contains laptop computers, iPads®, a large collection of Pasco science probes, and a portable SmartBoard®. Participants in the Academy use these technologies and software programs to create engaging, dynamic, and challenging lessons that are aligned to state standards. Selected lessons are presented in mentor teacher’s classrooms.

3.9 Co-Teaching in a Residency Program: Strengthening Positive Student Impact

Length of Session: 60 minutes

Susan Benner, University of Tennessee
Abigail Delvaux, University of Tennessee, Teaching Fellow
Andrew Turner, Central High School
Geri Landry, University of Tennessee

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

As teachers face greater accountability for their individual impact on student learning, specifically student performance on standardized tests, veteran teachers express concern over serving as a placement for teacher candidates. Educator preparation programs must not only design their programs to ensure no negative impact on student learning, they must offer assurances to their school-based partners that the placement of a teaching candidate will actually increase the achievement of secondary students. Co-teaching models offer such a means to prepare teacher candidates and improve student learning (Bacharach, Heck, & Dahlberg, 2010). Noyce teaching fellows in the TEACH/Here program complete a year-long internship grounded in this co-teaching structure. Fellows and their clinical instructors (CI) plan, implement instruction, and assess student learning collaboratively throughout the year. Initially, the CI assumes the leadership role in each of these areas, and, within a flexible gradual release structure, shifts major responsibility to the intern over the course of the year. Both are expected to be actively engaged in day-to-day planning, instruction, and assessment throughout the year.

Specific co-teaching strategies include: one teach, one observe; one teach, one assist; station teaching; parallel teaching; supple-
mental teaching; differentiated teaching; and team teaching. Essential elements of successful co-teaching include four broad categories: communication, relationship, classroom applications, and knowledge base of co-teaching (Bacharach, Heck, & Dahlberg, 2008). A Noyce fellow and her CI will illustrate how co-teaching played out in their classroom over the past year. Participants will offer examples from their programs.

3.10  My-Fi is Sci-Fi

Length of Session: 75 minutes

Michelle Romero, ASU STARR Noyce

Target Audience: Undergraduate and/or Graduate Noyce Scholars
Topic: Resources for Teachers

Want to get your students interested in science and raise their reading levels at the same time? Come and find out how you can start your very own science fiction book club with your students. We will discuss how to structure a club, different formats for clubs, getting donations, lists of great science fiction/fantasy books, and resources for starting your club. Participants will write discussion questions, learn how to teach students how to develop questions, and how to implement science into discussions.

3.11  Technology Resources for the Secondary Science Classroom

Length of Session: 75 minutes

Pamela Fraser-Abder, New York University
Janna Dougherty, New York University, Noyce Scholar
Joseph MacDonald, New York University, Noyce Scholar
Bryan Mosher, New York University, Noyce Scholar
Benjamin Osei-Bonsu, New York University, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff
Topic: Resources for Teachers

Participants will explore connective technology and will review web resources and instructional strategies that they can adapt and integrate into their own science curriculum. During this workshop participants will explore these three questions:

1. What connective technology resources are available for teaching secondary science?
2. Where can you find information on these resources?

3. How can you integrate these resources into your curriculum?

We will explore the use of media, industry, out-of-school education programs, non-formal science institutions, museums, and other science learning outlets as valuable segments of our nation’s science education infrastructure. Strategies for using technology (e.g., the iPad and apps) to expose your students to institutional resources in your immediate neighborhood, the entire country, and around the world will be discussed. At the end of the session, attendees will have web resources and instructional strategies that they can adapt and integrate into their own science curriculum. *Attendees are encouraged to bring their iPad, iPhone, and/or laptops if possible.

3.12  Math Day Murder Mystery

Length of Session: 75 minutes

Diane Barrett, University of Hawaii at Hilo
Jay Bumanglag, University of Hawaii at Hilo, Noyce Scholar
Jesse Robert, University of Hawaii at Hilo, Noyce Scholar
Virgilio Viernes, Jr., University of Hawaii at Hilo, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers

During this workshop, the presenters will describe a scenario-based Math Day. Using a CSI theme, Math Day participants needed to use technology and mathematics to narrow down the suspects and predict who was the killer. After receiving the details of the crime scene, participants at this workshop will have a chance to solve the case for themselves.

3.13  Effective Instructional Practices for English Learners in Math and Science Classrooms

Length of Session: 60 minutes

Adelina Alejandrino, Occidental College
Candace Kelly-Hodge, USC

Target Audience: Undergraduate and/or Graduate Noyce Scholars
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The English learners (Ells) in our California secondary math and science classrooms represent 50-60% of the student population. For this very reason, our new California teachers are prepared
during their credential programs to support and engage Ells in the math and science classrooms. In this workshop, participants will have an opportunity to experience and practice some of the effective instructional practices that California’s credential candidates acquire during their preparation programs. These research-based practices support English learners’ concept learning and language development in the math and/or science classrooms. Some of the Ells strategies that will be shared include: vocabulary development, gallery walks, four corners, learning logs, mind maps, and semantic feature analysis.

### 3.14 Integrated STEM: Building a STEM Toolbox for Solving Complex Problems

**Length of Session:** 75 minutes

Louis Nadelson, Boise State University

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

We will explore how integrated STEM can attend to a range of associated STEM content. Our focus will be on the significant increases in learning when using an integrated STEM curriculum which increases student motivation and engagement for learning, allows for the development of deeper understanding of the relationship between STEM curriculum and STEM applications, and creates a context that leads to greater retention of knowledge. Integrated STEM is what takes place outside of schools in business and industry, as workers seek solutions to complex problems. Preparing our teachers to teach integrated STEM will lead to better workforce development, and perhaps more importantly, a more STEM literate society. We will use some products that have been used by 100s of pre- and inservice teachers to explore integrated STEM which will be combined with tools for enhancing teachers’ capacity to prepare students with the associated 21st century skills. The hands-on/minds-on workshop will model the benefits of integrated STEM and offer tools for developing and assessing integrated STEM lessons. Activities to help participants better understand how a STEM-related topic can be integrated across the curriculum to include concepts generally taught in the isolated disciplines of science, technology, engineering, and math. The content and processes of this workshop directly address the practices of both the Common Core Standards of Mathematics and the Next Generation Science Standards.

### 3.15 Growing as an Action Researcher in a High School Mathematics Classroom

**Length of Session:** 60 minutes

Candace Terry, Tullahoma High School/Middle Tennessee State University, Master Teaching Fellow

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Evaluators/Education Researchers

**Topic:** Research and Evaluation

Discussion will revolve around the teacher as a researcher and the teacher evolving through reflection over teaching practices. An overview of the process of action research from beginning to end, followed with lessons learned from implementing action research will be discussed. Intertwined are components of three action research projects. One study conducted in an advanced algebra classroom within the mathematical content of exponential functions will be discussed. Central to the study is the use of writing as a heuristic, technology tools to address various mathematical representations, and exponential problems within real-world contexts. The second study continues around exponential functions with more emphasis given to a problem-based learning context. The third and current study regards professional learning communities igniting math teachers’ dialogues in an effort to advance student learning outcomes. The goals of this study are threefold: to improve student learning through teacher collaboration, to develop an understanding of Common Core Standards of Mathematics, and to learn about task-defined learning activities that focus on student-centered learning methodology. In closing, the presenter will reflect upon thoughts related to teacher as a researcher. How did a focus on student learning alter the teacher as a practitioner? What can be gained from the practice of action research? Additional questions from the audience will be encouraged.

**Session 4: Friday, May 31, 2013**

**10:35am - 11:50am**

**4.1 This session includes two 30-minute presentations.**

#### 4.1A Producing Highly Qualified Mathematics and Science Teachers through the Noyce Program

**Length of Session:** 30 minutes

Rosalind Hale, Xavier University of Louisiana
Ahdija Donatto, Xavier University of Louisiana
Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Xavier University of Louisiana, an Historically Black College and University, offers a Master of Arts in Teaching degree for candidates working towards initial teacher certification. The coursework includes the pedagogy of teaching and specific content related to working with students who have special needs. Participants who complete the program receive certification in their secondary content areas as well as in mild/moderate special education. Science and Mathematics Noyce Teacher Fellows also participate in professional development activities in their content areas. Noyce Master Teacher Fellows are all certified teachers in Mathematics or Science. They are involved in professional development to advance their teaching credentials. Master Teacher Fellows are being mentored by National Board Certified Teachers to obtain National Board for Professional Teaching Standards (NBPTS) Certification. This presentation will share with the audience the strategies used to develop the proposal, recruit qualified candidates, maintain candidates in the program, and the success of the program thus far. The discussion will involve the various methods of professional development used for the Teacher Fellows and the Master Teacher Fellows as well as the design of the NBPTS training. Participants will receive information that they will be able to use in any current Noyce program.

4.1B Designing Flexible Degree Program to Meet the Challenges of Finishing a Science Degree with Teaching Certification

Length of Session: 30 minutes

Brad Hoge, University of Houston - Downtown

Target Audience: Noyce Teaching Fellows, Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Natural Sciences Department (NS) at the University of Houston-Downtown (UHD) offers degrees in Biology, Chemistry, Biotechnology, and Biology and Physical Sciences. Concentrations are also offered within each program. The state of Texas is now requiring that all degree programs be constructed within 120 credit hours, however. This makes it difficult to fit the courses needed for teaching certification into existing degree programs, particularly within the two years of Noyce program support.

In response to the new state mandates, the NS department has created the Bachelor of Biology and Physical Science (BPS) with Emphasis in Teacher Certification degree program, which is a flexible degree program specifically meeting the needs of our Noyce Scholars. The UHD Noyce Teacher Scholarship Program does not require students to enter this degree plan, but strongly encourages the BPS degree so that students can complete requirements for teaching certification in a timely manner.

The BPS degree also provides the opportunity to concentrate studies in the life, physical, environmental, and/or earth sciences. Students can focus concentrations in biology, geology, environmental science, forensic science, chemistry, or physics with enough elective hours to meet the teaching certification curriculum. Students can also minor in an area outside of their concentration. Noyce Scholars completing this program then have the option of testing for additional teaching certifications in these areas beyond the standard general science certification. Texas has also recently begun requiring that all high school students take four years of science, which is creating an urgent need for physics, environmental, and earth science teachers. The BPS degree prepares our Noyce Scholars for these opportunities and makes them more competitive in the Texas job market.

4.2 This session includes two 30-minute presentations.

4.2A Recruiting Noyce Scholars Through a Learning Assistant Program

Length of Session: 30 minutes

Mary Nelson, George Mason University

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff

Topic: Recruitment and Marketing Strategies

The six month old Noyce program at Mason and NOVA is well underway. We are recruiting Noyce Scholars through a learning assistant (LA) program, based on UC Boulder’s successful program. We have already hired more than 40 LAs. These students assist other undergraduates in courses that they have already successfully completed. Primarily, they facilitate oral reviews, assist in classes and labs, and run help sessions. LAs commit ten hours weekly. They attend a Teaching and Learning Seminar in their first semester in the program where they discuss issues such as discourse, wait-time, learning styles, how to use rubrics and formative assessment. These sessions are conducted by Noyce PIs and senior personnel from five STEM disciplines in addition to Education faculty.

These seminars give LAs a place to voice concerns and questions while reporting on successes and challenges. LAs meet...
weekly with their supervisor and spend 5-6 hours a week with students. LAs use their remaining time to prepare. After successful completion of an LA position, Mason students may apply for a Noyce Scholarship. Besides teaching experience, Noyce Scholars will be given opportunities to work closely with mentors doing educational research. We already have three times more faculty applications than we can fund. This allows us to choose the best experience for our LAs and Noyce Scholars. A recent info session brought a plethora of new LA and faculty applications. Enthusiasm for the program is flourishing, and we anticipate at least five new Noyce Scholars in the fall.

4.2B The Noyce Summer Internship for Recruiting Potential STEM Teachers

*Length of Session: 30 minutes*

Jeffrey Nordine, Trinity University  
Shari Albright, Trinity University

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars  
**Topic:** Recruitment and Marketing Strategies

At Trinity University, we have created a program called the Noyce Summer Internship which provides rising sophomore and junior STEM majors with an opportunity to conduct research with a STEM faculty member and explore teaching by participating in Trinity’s Upward Bound program as a near-peer tutor and mentor. By coupling summer research with a teaching experience, the Noyce Summer Internship gives students a relatively low-risk opportunity to explore a nascent interest in teaching while gaining valuable experience in a research setting. This hybrid research and teaching program has been very successful in attracting top STEM students, and most Interns have opted to continue taking education courses after the conclusion of their summer experience. In this workshop, we will review the design of our Noyce Summer Internship, describe students’ experiences, and give strategies for replicating this powerful recruitment program.

4.3 This session includes two 30-minute presentations.

4.3A Mathematics Studio Classroom - A Greenhouse for Developing Teacher Leaders

*Length of Session: 30 minutes*

Thomas Dick, Oregon State University

**Target Audience:** Noyce Teaching Fellows, Noyce Master Teachers, Project Pls, Co-Pls, Other Faculty/Staff, School and District Administrators  
**Topic:** Teacher Leadership

The Mathematics Studio Program is a vehicle for transforming a school’s culture of mathematics professional learning and a greenhouse for developing teacher leaders. Its primary purpose is to transform the mathematics understanding and achievement of all students in a school.

What Happens in a Mathematics Classroom Studio? Over the course of a year, a cohort of “resident” teachers, coaches, and administrators meets four or five times for a "studio day" in the studio teacher’s classroom to:

- Design a plan that involves the "live" rehearsal of one or more "mathematically productive teaching routines"
- Observe the enacted plan
- Gather student data
- Analyze the data as evidence about the impact of instructional decisions and the lesson design
- Set action steps

What are the Key Features of Mathematically Productive Teaching Routines?

During studio work, teachers learn and rehearse mathematically productive teaching routines. By design, these practices engage students in evidence-based learning experiences that:

- Align directly with how students learn mathematics
- Recur regularly in the everyday work of teaching mathematics
- Typically involve one or more challenging aspects of mathematics teaching
- Enable mathematical access and challenge for all students

We will describe what typically happens during each studio cycle, including details about the following activities that typically occur during a studio cycle: (1) One half-day of leadership coaching for the studio principal, (2) One half-day of pre-studio inquiry with the studio teacher, and (3) One full studio day per cohort of 10-12 resident teachers and administrators.

4.3B Supporting Fellows: Transition to Teacher Leaders with Leadership Mentoring

*Length of Session: 30 minutes*

Michael Occhino, University of Rochester  
Rose Richman, Rochester City School District, Master Teaching Fellow

**Target Audience:** Noyce Master Teachers, Project Pls, Co-Pls, Other Faculty/Staff, School and District Administrators  
**Topic:** Teacher Leadership
Currently in Year 3, the University of Rochester Noyce Master Teaching Fellows Program is working to prepare a cadre of K-12 Mathematics and Science Fellows within the local city school system to serve as models, professional development providers and instructional leaders for their colleagues and pre-service teachers. The intent is to build long term capacity for sustaining high quality math and science teaching in urban schools. While our initial years had a strong focus on instruction (teaching and learning), we have begun developing our Noyce Fellows’ leadership capacity using content-focused coaching (West & Staub, 2003) as a transitioning bridge to teacher-leadership. We have done this through scaffolded, supported experiences that include providing each Master Teaching Fellow with a Leadership Mentor. This session describes the roles of the Leadership Mentors as facilitators of peer coaching between Fellows. The Mentors are experienced teachers and leaders who observe all components of the coaching experiences and provide debriefing opportunities for Fellows to reflect, analyze, and explicate their coaching. This has served to support Fellows to concurrently work to improve their own instructional practice and to try on their identity as effective teacher-leaders as coaches. In this session, we will share what we have learned from this process both from a Leadership Mentor and a Fellow perspective.

4.4 Strategies for Incorporating Evaluation into Teacher Scholarship Programs: A Case Study of Math for America Los Angeles Teacher Fellows Program

Length of Session: 60 minutes

Pam Mason, Math for America Los Angeles
Rebecca Eddy, Cobblestone Applied Research & Evaluation, Inc.

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Research and Evaluation

Establishing sound evaluation as an integral part of a program can be one of its strengths. Program evaluation can include a range of activities including developing a logic model to communicate and test program theory including the identification of key activities, outputs and outcomes; identifying indicators to measure program implementation and outcomes; setting appropriate goals and targets for success; keeping the program on track through regular meetings and review of program data; and drawing conclusions about the merit of a program. One program that incorporates an extensive evaluation plan funded by the National Science Foundation Robert Noyce Teacher Scholarship Program is the Math for America Los Angeles (MfA LA) Teacher Fellows Program. MfA LA was developed to ameliorate deficiencies in the secondary mathematics education in Los Angeles, particularly those in high-poverty areas. MfA LA is a partnership between University of Southern California, Claremont Graduate University and Harvey Mudd College. The program is focused on improving student achievement in mathematics by “developing transformational secondary school mathematics teachers” and uses teaching Fellowships and training as the primary mechanism for overcoming the problems of teacher recruitment, quality, and retention. In the presentation, the Project Director and external evaluator will provide specific information regarding the evaluation of MfA LA, including a review of key evaluation questions, program logic model, key indicators such as student-level and teacher-level data, and tips for incorporating useful and feasible evaluation strategies for similar Noyce-funded programs.

4.5 Innovative Noyce Program: The SEL Partnership

Length of Session: 60 minutes

Joseph Meyinsse, Southern University and A&M College

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers
Topic: Partnerships

This session will focus on the innovative Noyce Program partnership (SEL Partnership) at Southern University Baton Rouge, the lead institution, the East Baton Rouge Parish School System, and Louisiana State University. The presenter will discuss the innovative planning strategies in place for collaboration before the Noyce program started and how it expanded to include partners within and outside the State of Louisiana. This partnership was created to significantly increase the number of and enhance preservice teacher training program and in-service teacher professional development institutes.

4.6 Bringing Technology into the Classroom Lessons

Length of Session: 60 minutes

Justin Mare, University of Massachusetts Dartmouth
Stephanie Gaucher, University of Massachusetts Dartmouth, gaucher@umassd.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, School and District Administrators
Topic: Resources for Teachers

More and more in recent years there has been a consistent push to incorporate technology into the everyday classroom. School
administrators, teachers, students, and parents alike each push for their respective school district to increase the number of computers available in schools, to bring in IPads and tablets to increase interactivity and to even send the learning home electronically. In this workshop, we will provide new teachers with technological resources to bring their classroom, focusing on programs that come at a low cost or relatively no cost to the users. Our presentation aims to provide participants with a view of different technological pieces that can be used inside the classroom on any subject, as well as some that are specific to the science classroom. We will provide a brief overview of the technologies available that we have come across and used beneficially, and allow time for our viewers to use the technology we have used during our time teaching. In addition to the programs, we will provide a list of other resources and their benefits. Such additions will focus on technology that can be used outside the classroom that can benefit the education of the student.

4.7 Navigating the Next Generation Science Standards and the Common Core

Length of Session: 75 minutes

Michelle Romero, ASU STARR Noyce

Target Audience: Undergraduate and/or Graduate Noyce Scholars

Topic: Resources for Teachers

Feeling intimidated by the Next Generation Science Standards and the Common Core? Come and take an in-depth look at the new approved standards and participate in sample lessons that you can use in your classroom that utilize Common Core! Laptops needed.

4.8 Research-Based Literacy Instructional Strategies for Mathematics and Science Instruction

Length of Session: 60 minutes

Laveria F. Hutchison, University of Houston

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff

Topic: Supporting New Teachers

Approximately 25-33% of all beginning teachers will leave the profession within the first three years with a higher percentage leaving from high-poverty schools (Ingersoll, 2003). Noyce scholars work in high-poverty schools and have strong content knowledge in science or mathematics; but they often lack instructional literacy skills that support students who struggle with the reading of text sources. This presentation will demonstrate research-based literacy strategies that can support instruction and student learning. Participants will actively engage in learning to use think-alouds, reciprocal teaching, note taking, content journals and data charts. Participants will also be expected to engage in a question and answer strategy-use session.

4.9 PTLC Model: Support for New Teachers in High Needs Schools

Length of Session: 75 minutes

Jacqueline T. McDonnough, Virginia Commonwealth University

Sandra Joy Casad, Doctoral Research Assistant

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff

Topic: Supporting New Teachers

Our two-year induction program assists new teachers in integrating effective pedagogical methods with excellence in science content teaching. It serves as a Professional Teacher Learning Community (PTLC), creating a safe place for teachers to identify areas of continuous improvement and to engage in collective problem solving. Problem solving is identified as a key skill for resilience, and a teacher learning community composed of teacher peers can offer the support to carry this out (Castro, 2010; Tynj L, 2011). Initially, the PTLC was established to ensure that Pedagogical Content Knowledge was at the forefront of our teachers’ reform efforts (Luft, 2011). Additionally, we desired to promote lifelong learning habits and model continuous professional development which our teachers can use in their school-based teaching over the courses of their careers (Tynj L, 2011). We developed a professional development model based on current research into the successful reform efforts being carried out in urban settings (McLaughlin and Talbert, 2006) and using protocols to manage time designed by McDonald, et. al 2007. Planning and implementation of the program reflects a “systematic process in which teachers work together to analyze and improve their classroom practice” (DuFour, 2004).

In this presentation, we will share the foundational strategy of teacher collaboration through inquiry-based reform (McLaughlin, et al. 2006) which was used as a framework to guide planning for our meetings. We will also engage the audience in a problem solving protocol which is used in our induction program. We finish by presenting empirical results of our two-year action research oriented program involving newly graduated Noyce scholars.
4.10 Cards and Mind Reading: Noyce Scholar Explorations in High School Outreach

**Length of Session: 60 minutes**

Keith Hubbard, Stephen F. Austin State University  
Lesa Beverly, Stephen F. Austin State University  
Brittany Morton, Stephen F. Austin State University, Noyce Scholar  
Destiny Pottorf, Stephen F. Austin State, Noyce Fellow

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff  
**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

Through the Talented Teachers in Training for Texas (T4) program, Noyce Scholars prepared card trick-based probability investigations for high school students attending Stephen F. Austin State University’s STEM Day. Hear the scholars’ perspectives about what this opportunity adds to their preparation as high school teachers. We will also explore the collaborative relationships built through the implementation of these explorations, and get a taste of the actual puzzles used to capture the interest of the high school students.

4.11 Learning to Empathize, Empathizing to Learn: Reaching Beyond Cultural Competence in Urban Teaching

**Length of Session: 60 minutes**

Ruth Cossey, Mills College  
Steev Luntz, Mills College, Field Supervisor for Open the Gate Noyce Scholars  
Margo Maclnturf, Mills College, Noyce Scholar

**Target Audience:** Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators  
**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

To teach well, novice educators need to consider many aspects of morality including development of true empathy for their students. We desire to have Open the Gate Robert Noyce graduates of Teachers for Tomorrow’s school be not only culturally competent but culturally empathetic. We view the teaching of empathy as problematic, difficult, and absolutely essential. In this workshop, we will explore the five principled ways we at Mills College endeavor to teach empathy through the Leadership for Equity class, collegial problem solving collaborations in Mathematics and Chemistry courses, development and discussions of ethical dilemma case studies, social justice themed bi-

annual retreats, and structured fieldwork. In each instance preservice teachers are given the opportunity, asked and expected to bring forth their own lives as educators with multiple identities as text for their colleagues. And they are expected to hone their abilities to listen well and generously to the lived experiences of others. Join in a discussion of how our various programs help STEM Fellows deal with the impact on themselves and the urban youth they serve of the multiple intersections of race, class, linguistic proclivities, gender and sexual identities.

4.12 Supporting Inquiry-Based Learning with Computational Thinking: The Power and the Peril

**Length of Session: 75 minutes**

Robert M. Panoff, Shodor Education Foundation

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff  
**Topic:** Resources for Teachers

Students and faculty at all education levels are clearly spending much more of their days interacting with computing and communication tools than with each other. Is this good? Are all uses of technology in education helpful, and if not, how does one separate the benefits from the burdens? We will explore how technology enables dynamic representation in the sciences, arts, and humanities, giving us the opportunity to be more fully human as we seek new knowledge in service to society. Leveraging Shodor’s partnership with a European educator, Noyce participants have the opportunity to explore the global dimensions of inquiry-based education enhanced by computational thinking. Computing “matters” because quantitative reasoning, computational thinking, and multiscale modeling are the intellectual “heart and soul” of 21st century science and therefore are the essential skills of the 21st century workforce. Computing matters because we can apply the power of interactive computing to reach a deeper understanding of math and science and their role in understanding the world.

We will explore a transformation in STEM education, supported by interactive computing resources, promoting a dynamic encounter with our world through guided discovery. A world-class education requires world-class resources, and all should be able to bring interactive modeling environments to their own learning spaces. We will direct hands-on explorations of a variety of free and low-cost sources for modeling tools from Shodor and its Computational Science Education Reference Desk, a pathway project of the National Science Digital Library (http://www.nsdl.org).
4.13 Fun with Food! Hands-on (and edible!) Biology & Earth Science Activities

Length of Session: 60 minutes

Mika J. Hunter, Durham Public Schools, Duke University
Christopher Hewitt, Duke MAT Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Higher Education Institution Administrators
Topic: Resources for Teachers

There is no better way to explain complicated biological processes and environmental science concepts than using food. Learn how to incorporate fun food activities that demonstrate essential content standards for all levels of high school students. Participants will learn how to easily make ginger ale, kombucha, solar-heated smores and other tasty treats. Not only will your students have fun preparing and enjoying these items in class, they will also learn something!

4.14 Action Research: Professional Development to Advance Learning in STEM Disciplines

Length of Session: 60 minutes

Michaele Chappell, Middle Tennessee State University
Rick Vansotal, Middle Tennessee State University
Kyle Butler, Middle Tennessee State University
Candace Terry, Tullahoma High School, Mathematics Teacher & Master Teaching Fellow

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Evaluators/Education Researchers
Topic: Resources for Teachers

This presentation highlights both successes and challenges of implementing one of six Noyce Master Teaching Fellows [MTF] projects funded in 2009. Our MTF project aims to transform STEM teaching and learning by redefining STEM education professional development. In this presentation, we describe our latest tools and processes to assist teachers as they transform themselves into Teacher-Researchers, advancing STEM education and establishing best practices for STEM education in their local context (rural, suburban, and urban schools). An important aspect of this project includes using a mentoring model with university faculty as they guide fourteen teachers to develop individual teacher enhancement plans focused on content knowledge, pedagogy, and leadership competencies. Specifically, we discuss how the project teacher enhancement plan supports teachers as they develop, conduct, and analyze field-based action research projects; we emphasize particularly the goals, tools, and assessments of the action research. Moreover, one MTF will provide an impression of her experiences as she has journeyed through this transformative process. Furthermore, we impart reflections on learning experiences, successes, and potential barriers to facilitating teacher professional development through classroom research.

4.15 The Math Academy: A Model for Engaging High School Students and Teachers in Rich Mathematics Problems

Length of Session: 75 minutes

Elsa Medina, Cal Poly, San Luis Obispo
Amelie Schinck-Mikel, Cal Poly, San Luis Obispo

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators
Topic: Resources for Teachers

The Cal Poly Math Academy project established a partnership between Cal Poly and local high school districts to offer under-represented students and their teachers the opportunity to participate in a summer program designed to engage the participants in rich problem solving and critical thinking experiences. The Math Academy was piloted in the summer of 2012 with 18 students and 6 teachers. For the teachers, the program was a great professional development giving them an opportunity to learn more about the upcoming California Common Core Standards for Mathematics (CCCSM) as well as seeing teaching practices in action with students. For the students, it was an opportunity to solve non-traditional problems designed to increase their interest and perseverance in mathematics, their problem solving skills and mathematical confidence while having fun with mathematics. In this workshop, participants will have an opportunity to solve some of the fun mathematics problems the students and teachers enjoyed. Students’ creative solutions and feedback will also be presented.
1 Title: Bringing Primary Scientific Literature into the Classroom  
Principal Investigator: Bruce Alberts  
Email: balberts@aaas.org  
Institution: AAAS/Science  
Co-PI(s): Pamela Hines, AAAS / Science, phines@aaas.org  
Presenter(s): Melissa McCartney, AAAS / Science, mmccartn@aaas.org  
URL(s): http://scienceintheclassroom.org/  

“Science in the Classroom” (http://scienceintheclassroom.org) is a collection of annotated research papers and accompanying teaching materials designed to help students at advanced high school, community college, and undergraduate level understand the structure and workings of professional scientific research. Each annotated Science paper contains “Learning Lens,” which is used to selectively highlight and explain original text of the research article. An interactive glossary is included. Additionally, an educational scaffold—an expanded explanation of the figures, often with a close-up of the relevant section of the figure itself, has been built into each research paper. Also accompanying the paper are discussion questions, additional activities, connections to the English Language Arts Standards and the 8 Practices of the Next Generation Science Standards, and raw data provided the authors. We will present a tutorial on how to use this resource in a classroom and would appreciate feedback from the audience on how we can continue to make an expanded “Science in the Classroom” website a valuable resource for science teachers.

2 Title: Adelphi University Science Education Advancement (SEA) Program/NSF Robert Noyce Teacher Scholarship Program  
NSF Noyce Award Number: 1136380  
Principal Investigator: Tracy Hogan  
Email: hogan@adelphi.edu  
Institution: Adelphi University  
Co-PI(s): Beth Christensen, Adelphi University, christensen@adelphi.edu  
Presenter(s): Tracy Hogan, Adelphi University, hogan@adelphi.edu  
URL(s): http://education.adelphi.edu/departments-programs/curriculum-and-instruction/grant-funded-programs/  

The Adelphi University Science Education Advancement (SEA) Program is designed to encourage through scholarship support 26 individuals majoring in the sciences and those trained in STEM fields to consider a teaching career in science education and commit to teaching in a high needs public school to provide effective and engaging science instruction.

It has the following goals: 1) enhancing and broadening strong partnerships between Long Island high needs school sites, University faculty and administration, and regional informal learning environments; 2) responding to the critical need for secondary science teachers by incentivizing, through scholarship support, the completion of a rigorous teaching credentialing program by Scholars; 3) mentoring support for the Scholars throughout the program and during their first three years of teaching; 4) candidate development of effective teaching practices and behaviors through participation of the National Board for Professional Teaching Standards Take One! Program; 5) Scholar engagement in two unique field-based marine science courses exploring both the marine environments of Long Island through shipboard experiences with a professional marine educator and a travel abroad program led by Adelphi scientists; and 6) Scholars serving as interns with Nassau Board of Cooperative Education Services Summer Marine Biology Program working closely with naturalists in preparing and implementing science field experiences for students in grades K-12.

It is a shared vision among the project stakeholders (including experts in school administration, science pedagogy, science content, and testing/measurement), that the 1) focus on marine sciences as a vehicle for the teaching and learning of all science disciplines and 2) preparing teachers to use marine environments in their own curriculum holds great promise for the improvement of science education in a region spanning from New York City to the far reaches of Long Island and potentially impacting the science learning experience of thousands of students; a region comprised of a mosaic of over 130 school districts on the edge of some of the most important yet over-used coastal environments found along the Atlantic seaboard.

3 Title: PhysTEC Noyce: Six Institutions Supporting New Physics Teachers  
NSF Noyce Award Number: 0833210  
Principal Investigator: Monica Plisch  
Email: plisch@aps.org  
Institution: American Physical Society  
Co-PI(s): Beth Cunningham, AAPT, cunningham@aapt.org  
Jacob Clark Blickenstaff, APS, clickenstaff@aps.org  
Presenter(s): Jacob Clark Blickenstaff, APS, Blickenstaff@aps.org  
URL(s): http://www.phystec.org/noyce/  

The goal of PhysTEC Noyce award is to recruit more students into physics teacher education programs established through funding by the Physics Teacher Education Coalition (PhysTEC) project. Six PhysTEC Supported Sites are participating in the PhysTEC Noyce project. These institutions include Ball State University (BSU), Cornell University, Seattle Pacific University (SPU), University of Arkansas (AR), University of North Carolina at Chapel Hill (UNC), and Western Michigan University (WMU).

Students supported by the PhysTEC Noyce grant are not typical high school physics teachers: our awardees have a major or minor in physics and are more diverse than the average high school teacher. Our project supports students in the final years of their
licensure and even into early years of teaching through our Visiting Master Teachers, or VMTs. VMTs are experienced high school physics teachers who work a few hours per week maintaining contact with PhysTEC Noyce scholars, and act as professional mentors. Scholars report very high satisfaction with the support they receive from their VMTs.

The success of our recruitment efforts has been widely variable across our six sites. Additional data on the recruiting successes and challenges will be reported.

4
Title: From the Laboratory to the Classroom (Lab2Class)
NSF Noyce Award Number: 1240041
Principal Investigator: Sarah Irvine Belson
Email: sarah@american.edu
Institution: American University
Co-PI(s): John Nolan, American University Department of Mathematics and Statistics, jpnolan@american.edu
Kiho Kim, American University Department of Environmental Science, kiho@american.edu
Michael Keynes, American University Department of Mathematics and Statistics, keynes@american.edu
Bianca Abrams, Carnegie Institution of Washington, babrams@ciw.org
Presenter(s): Sarah Irvine Belson, American University, sarah@american.edu
http://www.american.edu/cas/seth/grants/lab2class.cfm

From the Laboratory to the Classroom (Lab2Class) is a new Teacher Fellowship program housed at American University in Washington DC. In partnership with the Toyota USA foundation and the DC Public and Public Charter Schools, the program brings candidates with strong backgrounds across the science and mathematics areas to a one-year, intensive residency program. The new components of the program focus particularly on Environmental Science, and working across the STEM fields.

5
Title: Science Teachers for AZ - Recruitment and Retention (STARR)
NSF Noyce Award Number: 0833311
Principal Investigator: Miles Orchink
Email: m.orchinik@asu.edu
Institution: Arizona State University, School of Life Sciences
Co-PI(s): Steven Semken, Associate, Arizona State University, semken@asu.edu
Presenter(s): Suzanne Cassano, STARR Noyce Scholarship Specialist, Arizona State University, suzanne.cassano@asu.edu

In the Phoenix metropolitan area, the shortage of secondary science teachers is experienced by all districts. In high-need districts this shortage is compounded by an on-going migration of teachers in these schools to those perceived to be less challenging. As a result, high-need schools often experience on-going vacancies in the teaching staff and a high turnover rate of qualified teachers. Science Teachers for Arizona-Recruitment and Retention (STARR) attempts to identify and support up to 60 qualified science teachers who will persist in high-need environments. Using passive and active forms of recruitment, in conjunction with a marketing plan, science students are identified and recruited to participate in undergraduate or post-baccalaureate programs that have extensive field experiences with diverse students, strong content knowledge requirements, and on-going opportunities to develop their science as inquiry instruction.

While students are completing their initial certification course work, field placements will be arranged in high-need settings that include students who are Native American, Latina/o, or African American. Upon graduation, STARR Noyce teachers participate in science-focused induction programs, which specifically support their use of science as inquiry in diverse classrooms, their development as science teachers, and their socialization into the school community. The intellectual merit of STARR Noyce resides in the theoretical grounding of this proposal, the attention to the continuum of development of a teacher, and the potential for the dissemination of knowledge pertaining to science teacher learning. The PI and co-PIs of this project are well-grounded in the research in science and science teacher education, as well as prominent contributors to this domain.

The dissemination of these findings will ultimately direct future recruitment endeavors in this area. The broader impact of qualified science teachers in the local community is limitless. Teachers supported through STARR Noyce will ultimately work with students who are most in need in terms of acquiring an education pertaining to science (e.g., students who are culturally and ethnically diverse). In addition, the funds from this program support current initiatives among faculty and staff at Arizona State University (ASU) to impact the production of science teachers. Support for teachers ultimately results in additional conversations about current ASU initiatives, as well as spurring the discussion of additional topics to be considered pertaining to science teacher education. STARR Noyce reinforces ASU’s commitment to the community by providing citizens who are able to participate in scientifically-oriented endeavors.

6
Title: Fostering Mathematics Teacher Leadership Through Multiple Venues: A Perspective Across Grades K-12
NSF Noyce Award Number: 0934821
Principal Investigator: W. Gary Martin
Email: martiwg@auburn.edu
Institution: Auburn University
Co-PI(s): Marilyn Strutchens, Auburn University, strutm@auburn.edu
Stephen Stuckwisch, Auburn University, stuckse@auburn.edu
Michel Smith, Auburn University, smith01@auburn.edu
The TEAM-Math Teacher Leader Academy supports 21 Elementary/Early Childhood Teacher Leaders in East-Central Alabama. Fellows in the Academy receive a $10,000 annual stipend over a 5-year span. All of the fellows hold master’s degree or higher and are working on an Ed.S. or Ph.D in elementary education or early childhood with emphasis on mathematics. Tuition and fees are paid by the Academy. As requirements for participation, fellows continue employment as mathematics teachers in high-needs school districts within the TEAM-Math partnership for each year that they receive annual stipends. They attend quarterly leadership workshops, complete Academy-sponsored graduate-level courses in mathematics education and mathematics to enhance their knowledge of the field. Fellows keep a log to demonstrate emerging leadership skills in applying new knowledge and insights in designing and providing support for school and district mathematics programs, and optionally in surrounding schools and districts.

7 Title: BEST: Benedictine Educating STEM Teachers
NSF Noyce Award Number: 1240091
Principal Investigator: Allison Wilson
Email: awilson@ben.edu
Institution: Benedictine University
Co-PI(s): Andrew Wig, Benedictine University, awig@ben.edu
Niina Ronkainen, Benedictine University, nronkainen@ben.edu
Thomas Wangler, Benedictine University, twangler@ben.edu
John Zigmond, Benedictine University, jzigmond@ben.edu
Presenter(s): Allison Wilson, Benedictine University, awilson@ben.edu
Andrew Wig, Benedictine University, awig@ben.edu
URL(s): http://www.benuscience.org/best/

Benedictine University is using the Noyce Scholarship Program to build on the current infrastructure in the College of Science and the School of Education to increase the number of STEM pre-service teachers that earn secondary teaching certification. New undergraduate students are specifically being recruited for STEM teacher training. In addition, a concerted effort is being made to recruit students from the large pool of undergraduate science and mathematics majors already enrolled in the College of Science. A “Careers in Science” seminar course is required of all College of Science students to explore careers in the sciences, including secondary teaching. Educational internships are available for freshmen and sophomores in informal teaching situations such as our Jurica-Suchy Nature Museum and in formal situations such as our Summer Sleuths program where problem-based learning concepts are put into action.

The BEST program also provides stipends to STEM professionals who earn their certification through the Alternative Certification Program. All BEST Scholars will be exposed to “Inquiry Weekend Workshops” to learn the basics of inquiry pedagogy from master teachers. They will be prepared to teach in high-need schools by receiving instruction from master teachers and performing their classroom observations in these types of classrooms. Scholars will also receive mentoring throughout their teaching internship and their first year of in-service teaching. The ultimate goals of the BEST program is to develop an inquiry-based teacher training framework that supports needs of the Next Generation Science Standards and to create an inspirational educational experience that will prepare future secondary STEM teachers for success in a variety of challenging educational settings.

8 Title: Boise State University Noyce II: Trajectory to Teaching from Recruiting to Career
NSF Noyce Award Number: 1240011
Principal Investigator: Louis Nadelson
Email: louisnadelson@boisestate.edu
Institution: Boise State University
Co-PI(s): Henry Charlier, Boise State University, hcharlier@boisestate.edu
Presenter(s): Louis Nadelson
URL(s): idoteach.boisestate.edu

Our multifaceted Noyce II project has merged with our IDoTeach program (our UTeach replication effort) resulting in a comprehensive approach to recruiting, retaining, and inducting secondary STEM teachers. Our collaboration involves Colleges of Education, Arts and Sciences, and Engineering. We are using summer internships for recruitment, scholarships for retention, and professional development and professional learning communities for induction. We have interns working with children in a zoo, a nature center, an outdoor school, in upward bound and doing research in research labs. Currently we are researching the influence of the summer internships on the Noyce scholars’ perceptions of STEM teaching, how they envision their summer internship activities influences their persistence and sustained engagement in our IDoTeach teacher preparation program.

9 Title: Math for America Boston: Teaching Scholars Program
NSF Noyce Award Number: 0934851
Principal Investigator: Suzanne Chapin
Email: schapin@bu.edu
Institution: Boston University
Co-PI(s): Glenn Stevens, Boston University, ghs@math.bu.edu
Steve Rosenberg, Boston University, sr@math.bu.edu
Donna Chevaire, Lawrence Public Schools, dchevaire@lawrence.k12.ma.us
Presenter(s): Suzanne Chapin, Boston University, schapin@bu.edu
URL(s): http://www.mathforamerica.org/Boston
The Math for America Boston: Noyce Teaching Scholars Program builds on our current program, Boston University’s (BU) Noyce Scholars Program in Mathematics, to recruit and support math teachers for work in high need districts. This program works with Master Teachers and Teaching Fellows. Master Teachers are highly qualified and experienced middle or high school math teachers in high need Boston area school systems who also are instructional leaders in their schools. Teaching Fellows are outstanding STEM graduates or professionals who wish to change careers and become teachers of math.

This six-year program is a collaboration of faculty in the School of Education and the College of Arts and Sciences, the Math for America program, and seven high-need school districts. Master Teachers must have majored in math and hold a master’s degree in a related field. They enroll part-time in a graduate degree program at BU that supports their development as leaders through an immersion experience in math and coursework focused on mathematics curriculum and professional development.

Currently, there are five Master Teachers. They have been active in BU’s teacher preparation program as well as in their schools as curriculum leaders. They return to campus for seminars where they either develop materials for colleagues or support new teachers. Master Teachers receive a stipend for five years while working as teacher leaders. Teaching Fellows enroll in a one-year graduate program that leads to the Master of Arts in Teaching (MAT) degree and initial teacher licensure as either a middle or high school math teacher. Clinical experiences and coursework are designed to support reflective teaching focused on student reasoning. Follow-up activities include workshops and seminars that keep Teaching Fellows connected to a robust and ongoing mathematical community of teachers, mathematics educators, and mathematicians. MfA Noyce Teaching Fellows are required to teach math in a high-needs district in the Boston area for a period of four years. They receive stipends while teaching in these districts. Currently, there are 8 Teaching Fellows: three are teaching in high-need schools and five are finishing the MAT degree program at BU.

10
Title: Pedagogical Context Knowledge: What Truly Matters
NSF Noyce Award Number: 0833278
Principal Investigator: Audrey A. Friedman
Email: friedmaa@bc.edu
Institution: Boston College
Co-PI(s): Katherine McNeill, Boston College, kmcneill@bc.edu
Vidya Madhavan, Boston College, madhavan@bc.edu
Presenter(s): Audrey A. Friedman, Boston College, friedmaa@bc.edu
URL(s): bc.seus.com

The overall research question that informed this investigation is: To what degree do Noyce Scholars perceive that the preparation required by the grant provided the appropriate subject matter, pedagogical content, and pedagogical knowledge to teach science effectively in urban settings? Three cohorts of Noyce Scholars (n=13) participated in 1-to-2 hour interviews that addressed the strengths and weaknesses of their preparation for teaching science in secondary urban public schools.

Additional data included field notes from conversations, which occurred during the Graduate Inquiry Seminar and classroom observations. Results indicated that all Scholars 1) felt prepared in subject matter knowledge due to strong undergraduate preparation and completion of two graduate courses in their subject matter area as part of the Program of Study for the M.Ed. in Science Education; 2) valued the Science Methods and Graduate Inquiry courses and university supervisors (former science teachers) as critical resources for sharing ways to think about and teach the discipline and to develop an inquiry stance; 3) appreciated the opportunity to conduct classroom-based research to focus on specific concerns, dilemmas, and questions in their teaching, to gather evidence, to pose, implement, and evaluate solutions, and to reflect critically about practice; and 4) believed that preparation enabled a lived mission of teaching and acting for social justice. The 5th, most critical result is a need for stronger preparation in pedagogical context knowledge: dealing with behavioral issues in inclusive settings, navigating the political context of the school, working with ineffective or effective leadership, and developing a more positive and culturally sensitive school culture.

11
Title: Project BoNUSS: Boston University Noyce Urban Science Scholarships
NSF Noyce Award Number: 1240055
Principal Investigator: Peter Garik
Email: garik@bu.edu
Institution: Boston University
Co-PI(s): Donald DeRosa, Dan Dill, Andrew Duffy, and Bennett Goldberg
Presenter(s): Peter Garik, Boston University, garik@bu.edu
Mark Greenman, Boston University, greenman@bu.edu

The Boston University Noyce Urban Science Scholarship project (Project BoNUSS) is in its first year and preparing for its first cohort of Master of Arts in Teaching (MAT) and undergraduate Noyce Scholars. The project team has spent the year working on formalizing an application process, recruitment, applicant evaluation, course design, and field placement arrangements. By combining the Noyce Scholarship with a scholarship from the School of Education, BoNUSS Scholars receive full tuition for their MAT program. We have purposefully designed an application process that weighs academic promise, interest in science teaching and the applicants’ deep concern for students’ well-
Boston University is a PhysTEC Comprehensive site and the BoNUSS and PhysTEC leadership teams have been working collaboratively to recruit physics majors to the undergraduate component of our Noyce award. PhysTEC, a project of the American Physical Society and the American Association of Physics Teachers, funds a Physics Teacher-in-Residence to encourage physics majors to consider high school teaching as a career option. Boston University’s Learning Assistant (LA) Program, patterned after that at the University of Colorado at Boulder, provides an early and first experience in teaching for many of our science major undergraduates. Some of students discover that they like teaching and serve as a potential pool of undergraduates for the Noyce scholarship. At least two sophomore physics majors engaged in the LA program have expressed interest in becoming Noyce Scholars at the end of their junior year.

For our first year of instruction, we have restructured the science MAT program to increase and enhance the pre-practicum and practicum field experiences. In addition to science methods courses to build pedagogical content knowledge, the Scholars will take a course dedicated to urban science teaching. For field placements, we are looking for classrooms where our Noyce Scholars will be able to practice good teaching but also experience classroom management issues that accompany high need student populations. We have agreements with multiple school districts in the Greater Boston area for placing Noyce Scholars, as well as special links to the Boston Public Schools through Boston University’s Collaborative Program that coordinates school outreach efforts. For these reasons, we are optimistic about finding good classroom placements.

12
Title: From Scholars to Teachers: Researching Career Pathways of Alumni from Boston University’s Noyce Scholarship Programs
NSF Noyce Award Number: 1240057
Principal Investigator: William Zahner
Email: wzahner@bu.edu
Institution: Boston University
Co-PI(s): Suzanne Chapin, Boston University, schapin@bu.edu
Timothy Heeren, Boston University, tch@bu.edu
Presenter(s): William Zahner, Boston University, wzahner@bu.edu

This three-year study will use a longitudinal, mixed methods, comparative design to extend and expand the current program evaluation of Boston University’s (BU) Noyce Scholarship Programs. The study will track and compare four groups of teachers: 1) Noyce Scholars who have graduated from BU’s MAT program in Mathematics, 2) Alumni of Teach For America Boston who have taken some mathematics education courses at BU, but who were certified through an alternative certification program, 3) Alumni of BU’s traditional undergraduate mathematics education program who teach in high need schools, and 4) Colleagues of BU Noyce scholars in the schools where they teach.

Using survey data and collections of artifacts of practice, the study will examine a) the characteristics and career trajectories of Noyce Program alumni who remain teaching in high need schools beyond their required service commitment, and b) whether the teaching practices of Noyce Program alumni differ from the practices of colleagues in their high need schools. The findings of this study will have implications for Noyce programs and for teacher education programs that prepare mathematics teachers to teach in high need schools.

13
Title: Bryn Mawr/Haverford Colleges Noyce Teacher Scholarship Program
NSF Noyce Award Number: 0934831
Principal Investigator: Victor Donnay
Email: bhallam@brynmawr.edu
Institution: Bryn Mawr College, Haverford College
Co-PI(s): Josh Sabloff, Haverford College, jsabloff@haverford.edu
Alice Lesnick, Bryn Mawr College, alesnick@brynmawr.edu
Presenter(s): Hannah Weinstein, Bryn Mawr College, hweinstein@brynmawr.edu
URL(s): www.brynmawr.edu/noyce
www.haverford.edu/noyce

The goals and structure of a liberal arts education make it difficult for students to complete the extensive requirements for certification in four years. In response to these constraints, Bryn Mawr and Haverford developed a fifth-year option whereby students who completed their A.B. degree could complete their remaining education requirements and carry out their student teaching in a postgraduate year. The Bryn Mawr-Haverford Noyce Scholarships are offered in a variety of formats. Juniors are eligible for a two-year scholarship that provides funding for their senior year and for the 5th year Post-Baccalaureate Teacher Education Program. Seniors and alumni and alumnae from Bryn Mawr and Haverford are eligible for a one-year scholarship for the 5th year Post-Baccalaureate Teacher Education Program. Recently the program has added the Penn Master’s 5th year option in which scholars awarded the Noyce Scholarship from Bryn Mawr can receive their certification and a master’s degree in education from the University of Pennsylvania in one year. In all cases, scholars must be math or science majors who will complete the requirements for teacher certification in Pennsylvania and then teach for two-years in a high-needs school district for each year of scholarship support received.

The program currently has 5 scholars in various stages of pre-service teacher preparation and one graduate. 22 students...
have participated in school-based internships in Philadelphia area high need secondary schools. Building the Philadelphia Regional Noyce Partnership with other institutions in the Philadelphia region that have Noyce programs (Drexel, La Salle, Penn, Temple and Saint Joseph’s) has created synergies that support further develop scholars in the Bryn Mawr-Haverford Noyce Program.

Through the partnership, in addition to other benefits, our scholars have been able to attend award winning professional development workshops, be placed in partnership affiliated master teachers’ classrooms for student teaching and internships, have access to mentors in the Philadelphia Teacher Residency program and become part of a larger Noyce support network.

14
Title: Cal Poly Noyce Scholars Program, Phase II
NSF Noyce Award Number: 1239827
Principal Investigator: Todd Grundmeier
Email: tgrundme@calpoly.edu
Institution: Cal Poly State University
Co-PI(s): Elsa Medina, Cal Poly State University, emedina@calpoly.edu
Presenter(s): Elsa Medina, Cal Poly State University, emedina@calpoly.edu
URL(s): http://www.cesame.calpoly.edu/noyce/

Our program was established in 2007 and we have awarded 27 scholarships to future mathematics teachers. In addition to providing scholarships, our program has a summer workshop component for scholars to learn about the teaching and learning of mathematics as well as issues of teaching in high need districts. This year we are starting Phase II of the program. The new grant will provide 9 two-year scholarships and 12 one-year scholarships of $12,000/year and continue the summer workshops. Noyce scholars will receive an $800 travel stipend to attend summer workshops.

15
Title: Cal Poly San Luis Obispo Science Noyce Scholars Program
NSF Noyce Award Number: 0833353
Principal Investigator: John Keller
Email: jmkeller@calpoly.edu
Institution: Cal Poly San Luis Obispo
Co-PI(s): Seth Bush, Cal Poly, sbush@calpoly.edu
Ed Himelblau, Cal Poly, ehimelbl@calpoly.edu
Presenter(s): John Keller, Cal Poly, jmkeller@calpoly.edu
URL(s): http://www.cesame.calpoly.edu/noyce/

The Cal Poly Science Noyce Scholars Program represents one of several campus efforts to recruit, prepare, and retain high quality STEM undergraduates from Cal Poly San Luis Obispo for teaching (www.cesame.calpoly.edu/noyce). Awarded in September 2008, the program has successfully recruited four cohorts with a total of 33 Noyce Scholars. Of these, eighteen received one-year scholarships, eleven received funding for two years, and four have been three-year scholars. All together, the program will award 52 scholarships to 33 Scholars, in alignment with our proposal goal of providing 54 scholarships to at least 30 scholars. Successful components of the Cal Poly Science Noyce Program are described below.

Over the past four years, the program has sponsored 36 Noyce Seminars spanning such topics as: race, ethnicity and gender in STEM; insights into migrant education; modeling as a science pedagogical strategy; strategies for English language learners; citizen science; classroom management; seeking positions in high need school districts; and highly popular Google+ Hangout sessions with Cal Poly Noyce alumni teaching in the field. In addition, over 40% of the Cal Poly Science Noyce Scholars have conducted summer research at Department of Energy, NASA, NOAA, and NOAO national lab-oratory facilities through the California State University STEM Teacher and Researcher (STAR) Program (www.StarTeacherResearcher.org).

The primary goal of the STAR Program is to foster identity among future teachers as “teacher-researchers” by immersing participants in the scientific and engineering practices so that they can better engage their future students in these same practices. The Cal Poly Science Noyce program has also supported alumni in professional development, including 2010 and 2013 Cal Poly summer workshops on Modeling Science Instruction, two 2012 Google Faculty Institute professional development opportunities, and the 2011 NASA Noyce Summer Institute which brought 22 Noyce Scholars from around the country to work with NASA educators and scientists. The Cal Poly Science Noyce Program has also coordinated with the Cal Poly Upward Bound Program to involve Noyce Scholars as tutors, summer instructors, and Saturday science workshop leaders. Finally, Cal Poly Noyce Scholars have selected three Cal Poly Noyce Distinguished New Teacher Award Recipients who have provided keynote addresses as part of an annual Noyce Narrative series.

16
Title: California State Polytechnic University, Pomona Robert Noyce Scholarship Program: Building a Community of Learners
NSF Noyce Award Number: 0934964
Principal Investigator: Nicole Wickler
Email: nizwickler@csupomona.edu
Institution: California State Polytechnic University, Pomona
Presenter(s): Nicole Wickler, California State Polytechnic University, Pomona, nizwickler@csupomona.edu
URL(s): http://www.csupomona.edu/~noyce/

The Cal Poly Pomona Robert Noyce Scholar Program (Phase II) began in 2004/05 academic year. The program has supported 60 math and science Scholars through financial assistance, monthly PLC seminars, travel to professional conferences, and summer
research experiences. We have leveraged other grant funds to expand support to Scholars and connect with other Noyce-funded projects in the western states. We are systematically tracking program activities and continue to track former Scholars after they exit the program. Data suggest monthly seminars related to math and science teaching provide Scholars with information that is relevant and useful for teaching in the classroom, and information that will help them to be better teachers. Seminars include undergraduate students, graduate students, beginning teachers, mentor teachers, and former Scholars. Evaluation data indicate that financial support for Scholars helps them to focus on their academic development, collaborate with others and avoid seeking additional employment. Additionally, some Scholars indicated they would not have pursued a teaching position without the Scholar program.

17
Title: California State Polytechnic University, Pomona’s Robert Noyce Master Teacher Fellows Program: Improving Science and Math Professional Development Through Research
NSF Noyce Award Number: 1136428
Principal Investigator: Nicole Wickler
Email: nizwickler@csupomona.edu
Institution: California State Polytechnic University, Pomona
Co-PI(s): Paul Beardsley, California State Polytechnic University, Pomona, pmbeadsley@csupomona.edu
Michael Page, California State Polytechnic University, Pomona, mpage@csupomona.edu
Laurie Riggs, California State Polytechnic University, Pomona, lriggs@csupomona.edu
Homeyra Sadaghiani, California State Polytechnic University, Pomona, hrsadaghiani@csupomona.edu
Presenter(s): Paul Beardsley, California State Polytechnic University, Pomona, pmbeadsley@csupomona.edu
Homeyra Sadaghiani, California State Polytechnic University, Pomona, hrsadaghiani@csupomona.edu
Nicole Wickler, California State Polytechnic University, Pomona, nwickler@csupomona.edu
URL(s): http://sci.csupomona.edu/mtf/index.php

The Cal Poly Pomona’s Robert Noyce Master Teacher Fellows Program began in the 2011/12 academic year. The program currently supports 19 math and science Master Teacher Fellows (MTFs) in 7th and 8th grades. MTFs receive financial assistance, professional development (i.e., summer institute and follow-up meetings using the STeLLA model), assistance in furthering their own formal training (e.g., national certification), and travel to professional conferences. This professional development program is designed to deepen MTFs’ understanding of core science and/or math concepts, help MTFs examine how students make sense of those concepts and commonly misunderstand them, analyze and improve MTFs’ teaching, and deepen MTFs’ understanding and experience with supporting peer teachers. We have also established a control group of teachers with whom we will compare the MTFs on various outcome variables. Formal evaluation activities will examine the changes in both teacher and student math and/or science content. In addition, changes in teacher pedagogical content knowledge will be measured. Preliminary data suggest MTFs have already benefited from the 2012 summer institute and follow-up meetings in both teacher pedagogy and content knowledge.

18
Title: Robert Noyce Fellowship at California State University Bakersfield
NSF Noyce Award Number: 1136342
Principal Investigator: Carl Kloock
Email: ckloock@csub.edu
Institution: California State University, Bakersfield
Co-PI(s): Ronald Hughes, CSU Bakersfield, rhughes@csub.edu
Jacqueline Hughes, CSU Bakersfield, jhughes4@csub.edu
Presenter(s): Carl Kloock, CSU Bakersfield, ckloock@csub.edu
URL(s): http://www.csub.edu/ScienceED/

The Robert Noyce Fellowship Program at California State University, Bakersfield (CSUB) supports students in our 2-year MS in Science Education program, which provides Fellows with credential coursework, science breadth and specialized science pedagogy coursework. We accepted five Fellows in Fall 2012; an additional Fellow was admitted Spring 2013. Four of these six fellows are career changers. We have accepted three more Fellows (one career changer) to begin in Fall 2013 and are currently seeking additional applicants. No Fellows have yet finished the two-year program.

19
Title: TEMSII: Teaching Excellence in Math and Science Phase II Noyce Math and Science Scholars Consortium
NSF Noyce Award Number: 1136431
Principal Investigator: David Kagan
Email: baranguren@csuchico.edu
Institution: California State University, Chico
Co-PI(s): Deidre Sessoms, California State University, Sacramento, dsessoms@skymail.csus.edu
Presenter(s): Brandi Aranguren, California State University, Chico, baranguren@csuchico.edu
URL(s): http://www.csuchico.edu/cmse/

This consortium partners two culturally different universities, California State University, Chico and California State University, Sacramento, using the strengths of both in providing highly qualified mathematics and science teachers for a combined service region larger than the size of Ohio. Chico is primarily rural in nature, including large, remote, mountainous regions with high poverty rates; Sacramento serves an expanded urban area with large populations of low income, culturally and linguistically diverse students. One of the unique features of this partnership is to use the differences in the individual regions to help Noyce scholars to develop a stronger and more diverse understanding of educational challenges.
TEMISII follows our successful model from Phase I in which two joint seminars are conducted annually, one in each area, held in area teacher classrooms and are co-facilitated by mentor teachers in the area. TEMISII also provides opportunities for student teacher exchange programs between the two campuses allowing Noyce Scholars to visit and better understand the unique characteristics and needs of the students in the different regions. Both campuses have incorporated TEMISII into their efforts to double the number of math and science teachers they produce. Each campus has directed its efforts in different directions to again match needs and strengths. Both campuses have integrated TEMISII into expanding opportunities for undergraduates. TEMISII efforts have been strengthened on both campuses through collaborations with existing campus programs, such as the Alliance for Minority Participation, the Mathematics and Science Teaching Initiative, California Postsecondary Education Commission grant programs for retaining new math and science teachers, and the Beginning Teacher Support and Assessment induction programs.

20
Title: Noyce Scholarship Program at the California State University, East Bay

NSF Noyce Award Number: 0833348
Principal Investigator: Kathy Hann
Email: kathy.hann@csueastbay.edu
Institution: California State University, East Bay
Co-PI(s): David R. Stronck, California State University, East Bay, david.stronck@csueastbay.edu
Presenter(s): David R. Stronck, CSU, East Bay

The National Science Foundation has funded the California State University (CSU), East Bay to provide the Robert Noyce Scholarship Program to enhance science and math education in K-12 schools in Alameda and Contra Costa Counties and to increase the number of science and math students who obtain teaching credentials. Funding will have supported the program from 2008 through 2013. Phase I Noyce Scholarships will be used to attract academically successful community college transfers, senior mathematics and science majors and STEM professionals to become highly effective teachers in urban school districts. In 2012-2013, 11 students have Noyce scholarships at $10,000 during this year. The program includes a professional support network and mentoring. In 2009, the Noyce Fellowship program was added. Now the College of Science and the College of Education and Allied Studies at CSU, East Bay, the Alameda County Office of Education, the Stephen D. Bechtel Jr. Foundation, and the Edward Teller Foundation collaborate to increase the number of highly qualified science and math student who will obtain a teaching credential and the master’s degree at CSU, East Bay. This program will provide scholarships for the first two credential/master’s years and salary supplements for the subsequent three teaching years for two cohorts of eight Fellows. Each fellow will receive a total of $60,000 in support from the Noyce Program.

Recruits have come from some of the most prestigious universities in the country as well as from at least one foreign country. Some have come from community colleges, others through the CSU East Bay four-year undergraduate programs, and some have transferred into CSU East Bay’s upper-division programs from local community colleges. Contributing to the Noyce Scholars group are Cornell University, Massachusetts Institute of Technology, University of California, Berkeley, University of California, Irvine, California Polytechnic State University, San Luis Obispo, University of New Hampshire, University of Tulsa, Azusa Pacific University, Silliman University of the Philippines, Ohlone Community College, Berea College, De Anza College, Diablo Valley College, and Mission College of Santa Clara. The Noyce Scholars are well prepared academically. Clearly they are either highly gifted intellectually or exceptionally hard working, or both. The mean GPA of the group at the time of their recruitment was 3.56. Over the course of the past year, they, as a group, have completed 108 courses, an average of over 4 classes each, attesting to the fact that they have been fully engaged in their coursework. Furthermore, they are pleased with their classes, reporting an average of 4.1 on a 5 point satisfaction scale, with 5 indicating “highly satisfied”. The lowest of the scores reported was a 3.

21
Title: Project MT2: Co-Teachers to Colleagues, Two years of Collaboration and Reflection

NSF Noyce Award Number: 1035315
Principal Investigator: Martin Bonsangue
Email: mbonsangue@fullerton.edu
Institution: California State University, Fullerton
Co-PI(s): Ruth Yopp-Edwards, California State University, Fullerton, ryopp@fullerton.edu
Mark Ellis, California State University, Fullerton, mel-lis@fullerton.edu
Presenter(s): Marvin Soto, Norwalk-La Mirada Unified School District, marvin968@msn.com
Gilbert Hernandez, Norwalk-La Mirada Unified School District, gilmh20@csu.fullerton.edu

Los Alisos Middle School is located in Norwalk, CA, a suburb just outside Los Angeles. Eighty-five percent of the student population at Los Alisos is Hispanic and the same number is eligible for free/reduced lunch. Our participation in the Noyce Project MT2 has had a tremendous benefit for students, the Teaching Fellow, and the Master Teaching Fellow.

1. Los Alisos Students: The first year of our Noyce partnership (Co-Teachers) allowed for better classroom management, increased small group/differentiated instruction, and lessons developed through collaboration. The second year of our Noyce partnership (Colleagues) benefits the students as
we continue support each other’s efforts to integrate technology and develop lessons focusing on the CCSS Standards for Mathematical Practice.

2. Teaching Fellow, Gilbert Hernandez: The first year was focused on co-planning and co-teaching lessons that addressed the needs of our students. Daily reflection on teaching with an experienced colleague and more formally through completion of the California Teacher Performance Assessment strengthened my ability to critically evaluate the impact of my teaching on student learning. The second year allowed for continued support and collaboration as colleagues teaching at the same school. This helped me develop ideas, push through barriers, and adjust instruction.

3. Master Teaching Fellow, Marvin Soto: The first year of Co-Teaching involved taking part in the National Board Certification process, which allowed for many opportunities for self-reflection. The second year of our Noyce partnership allowed for collaboration on planning units of study and lesson design. Our unique partnership also allowed for reflecting on lessons from two different perspectives.

22
Title: Teaching as a Primary Profession (TaPP) in Biology and Chemistry
NSF Noyce Award Number: 0934910
Principal Investigator: Barbara L. Gonzalez
Email: bgonzalez@fullerton.edu
Institution: California State University, Fullerton
California State University Fullerton
Co-Pi(s): Victoria Costa, California State University Fullerton, vcosta@fullerton.edu
Chandra Srinivasan, California State University Fullerton, chandra@fullerton.edu
Marcelo Tolmasky, California State University Fullerton, vcosta@fullerton.edu
Presenter(s): Barbara L. Gonzalez, California State University Fullerton, bgonzalez@fullerton.edu

California State University Fullerton (CSUF) in collaboration with Anaheim Union High School District, Mount San Antonio College, and University of California Los Angeles has implemented Teaching as a Primary Profession (TaPP) in Biology and Biochemistry. The TaPP program encourages talented biology and biochemistry undergraduates to become highly qualified secondary teachers of both biology and chemistry. Scholarships support those who are in the process or have completed a bachelor’s degree in biology or biochemistry and are enrolled in the CSUF secondary credential program with the intention of earning a teaching credential with authorization in California to teach both high school biology and chemistry. TaPP Scholars meet regularly for mentoring, seminars and engage in science education outreach activities. Our aim is to prepare biology and biochemistry majors for service in public secondary schools who achieve highly qualified status in both biology and chemistry, and have research experience in both science and science education. Five TaPP scholars are currently teaching in high need schools.

23
Title: The Noyce Program at CSULB - Making a Difference Today & Tomorrow
NSF Noyce Award Number: 0833349
Principal Investigator: Laura Henriques
Email: lhenriqu@csulb.edu
Institution: California State University, Long Beach
Presenter(s): Jessica Mejia, CSULB, jess0188@gmail.com
Jessica Young, CSULB, jyoung88@gmail.com
URL(s): http://www.cnsm.csulb.edu/centers/sas/noyce/

Now in our final year of funding, the Noyce Scholars Projects (Noyce I and Noyce II) at California State University, Long Beach have supported 65 teachers over nine years. As preservice teachers, the Noyce Scholars participate in professional development seminar series, tutor and do early field work at high-need schools where they will eventually student teach. The persistence and retention rates for the scholars is outstanding. Of the 59 Scholars who completed their credential in time to be hired for 2012-2013, 92% started teaching with 96% of them continuing to teach math and science classrooms beyond their obligated service.

Of the three who left high-need classrooms, two were pink-slipped (and hired by non-high need districts) and one went to graduate school, and 94% of them have stayed in high need schools. Additionally, Noyce alumni are taking on leadership positions at their school sites. Noyce alums have served as mentor teachers to Noyce Scholars and they are returning to campus to get Master’s degrees in Science Education, Math or Math Education.

24
Title: CSUN NSF Teaching Fellowship Program
NSF Noyce Award Number: 0934972
Principal Investigator: Kellie Michele Evans
Email: kellie.m.evans@csu.edu
Institution: California State University, Northridge
Co-Pi(s): Ivan Cheng, California State University, Northridge, ivan.cheng@csun.edu
Julie Gainsburg, California State University, Northridge, julie.gainsburg@csun.edu
Presenter(s): Kellie Michele Evans, California State University, Northridge, kellie.m.evans@csu.edu
URL(s): http://www.csun.edu/~kme52026/csunsf.html

The CSUN NSF Teaching Fellowship Program at California State University, Northridge (CSUN) is in the midst of its fourth year. The program currently supports 12 Teaching Fellows (TFs) and 3 Master Teaching Fellows (MTFs). Four TFs completed the single subject teacher credential program in Spring 2012 and 2 finished
in Fall 2012, another 4 will finish in Spring 2013. Two TFs are in their second year of teaching, 3 are in their first year of teaching, and 2 are long-term substitutes teaching in high-need districts (and looking for full-time positions). All 3 MTFs completed their master’s degrees in mathematics education in Spring 2012.

Throughout the year, all Fellows participated in monthly meetings, which included featured speakers on topics such as (1) Preparing students to critically think their way through the Common Core; (2) GeoGebra for secondary math teachers; (3) Formative assessment in the classroom; (4) Smart Board math tools; and (coming soon) (5) Grant writing for teachers. Fellows were also supported to attend the California Mathematics Council-South Conference, the Curtis Center Mathematics and Teaching Conference, the Western Regional Noyce Conference, and CSUN’s own Math Morsels Conference for teachers.

During the summer of 2012, Fellows participated in UCLA’s New Teacher Institute and the NCTM High School Institute on Reasoning and Sense Making. Four TFs teach at schools chartered through high-need districts and with unique characteristics. For example, one focuses on “personalized learning”, so that in-class and homework assignments must be individualized for each student. Another is a brand new “hybrid” high school which uses a blended learning model developed by the USC Rossier School of Education and which includes technology for students and teachers to allow access to digital coursework and web content. TFs have been working with e-mentors provided by the New Teacher Center and paid for by CSUN. The program has gotten mixed reviews due to it not being part of a formal induction program. Mentoring for TFs is currently being modified and enhanced to better support their needs. Although the program has faced some attrition challenges, it is making strides toward a main goal: to create a developing community of CSUN faculty, local teacher leaders, and preservice teachers who support one another and work together to engage secondary students in learning mathematics. The improving job market should enhance these efforts in the coming year.

26
Title: CSUSB Noyce Teaching and Master Teaching Fellows
NSF Noyce Award Number: 0934761
Principal Investigator: Davida Fischman
Email: fischman@csusb.edu
Institution: California State University, San Bernardino
Co-PI(s): Joseph Jesunathadas, Carol Cronk, Ronnie Henderson
Presenter(s): Davida Fischman, California State University, San Bernardino, fischman@csusb.edu
URL(s): noyce.csusb.edu

The CSUSB Noyce Teaching and Master Teaching Fellowships program addresses local challenges by developing, implementing and evaluating a comprehensive professional development program in mathematics education that will result in improving the quality of instruction, and ultimately increasing student achievement among secondary students in Inland Empire school districts such as San Bernardino City USD, Chaffey Union High School District, Victorville High School District, and Moreno Valley USD. All Teaching and Master Teaching Fellows will earn a Master of Arts in Teaching Mathematics at CSUSB. It is our experience that most Master’s degrees earned by teachers in our service area are not specifically content-related but rather focus on general curriculum and instruction or on administration; thus this degree will significantly enhance the depth and breadth of mathematical content knowledge as well as content knowledge for teaching among the Fellows.
During the five-year Fellowship, Teaching Fellows and Master Teaching Fellows engage in lesson study in mixed grade teams. Each team is provided ten full days to meet with a facilitator during the regular school day, to study mathematical concepts and prepare, teach, and analyze and discuss research lessons. The lesson study teams have formed a strong and supportive bond, and in addition to the designated lesson study time, the teachers frequently meet together on their own time to share strategies, do their own homework, and plan instruction.

The Fellows are so excited about the lesson study process that they requested to attend the Chicago Lesson Study Conference in May 2011, and the Noyce Fellowship program has supported them in doing so. They have also shared their lesson study expertise with the larger Noyce community in breakout sessions at the Western Regional Noyce Conference and the Annual Noyce Conference in July 2011. In 2012, they conducted a public research lesson and follow-up discussion at a state-funded lesson study conference in San Bernardino. As a result of the parallel processes of engaging in study for a master’s degree in teaching mathematics and ongoing lesson study, the Fellows are becoming a supportive and productive community of teachers focused on enhancing all aspects of their teaching. The Professional Learning Community of Fellows is already expanding its influence in the area. Several have decided to apply for National Board Certification and have included colleagues from their schools to join them in this effort. Others are bringing to their department meetings ideas and strategies they have learned in the lesson study sessions and in the MAT program.

27
Title: CSU San Bernardino Noyce Math and Science Scholarships Program
NSF Noyce Award Number: 1035229
Principal Investigator: Davida Fischman
Email: fischman@csusb.edu
Institution: California State University, San Bernardino
Co-PI(s): Carol Cronk, OMSD, carol.cronk@omsd.net
Ronnie Henderson, SBCUSD, ronnie.henderson@sbcusd.com
Joseph Jesunathadas, CSU San Bernardino, jjesunat@csusb.edu
Presenter(s): Davida Fischman, CSUSB College of Natural Science, fischman@csusb.edu
Cathy Spencer, CSUSB College of Education, csporter@csusb.edu

The major components of the CSU San Bernardino Noyce program are mentored classroom experiences (2 full weeks in the beginning of the academic year, and weekly thereafter), monthly seminars attended jointly by scholars and mentor teachers, expanded supervision of Noyce scholars’ student teaching by subject-matter faculty, and enhanced academic advising by Natural Sciences as well as Education faculty. All of these are firmly grounded in a strong partnership between the CSUSB College of Natural Sciences, College of Education, and the San Bernardino City Unified School District.

Additionally, we encourage and support financially scholars’ attendance at local and regional meetings and conferences such as the Riverside-San Bernardino Counties Math Teachers Association Dinner Meetings, the Western Regional Noyce Conference, and the California Math Council’s South Annual Conference. Structured mentoring experiences are at the core of our program; these are particularly valuable since our Noyce scholars are primarily undergraduates who have had little or no experience in the classroom. The program partners collaborate to identify lead teachers in the district who have outstanding skills both in teaching secondary students and in working with adults. The mentors and scholars are then matched, based on perceived needs of the scholars and skills of the teachers.

While in the Noyce program, each scholar progresses through a series of benchmarks: at first the scholar observes classroom activities with a specific focus and records them, and then over time progresses from individual ad hoc tutoring to working with small groups, then co-planning and teaching portions of lessons, and eventually to independent planning and teaching of lessons under the supervision of the mentor teacher.

The Noyce seminars provide scholars and mentor teachers with additional opportunities to learn from university and district experts. Focus topics for 2012-13 are classroom management for scholars, Common Core State Standards (CCSS) for mentor-scholar teams, and mentoring skills and additional CCSS work for mentor teachers. Additional topics of particular interest during the years have been formative and summative assessment, making use of resources to teach conceptually, and standards-aligned teaching with understanding. Many scholars have said that without the Noyce-sponsored mentored and structured classroom experiences and the confidence they gain through them, they would not have made the decision to become a teacher. Noyce graduates have said that their first year of teaching is immeasurably more successful than it would otherwise have been after having learned so much about teaching in all its aspects from their mentor teachers and through the Noyce seminars and conferences they attended. Feedback from district personnel indicates a high level of satisfaction with the work of the Noyce teachers.

28
Title: California State University, Stanislaus Robert Noyce Scholars: A Community of Pre-Service STEM Teachers From California’s Central Valley
NSF Noyce Award Number: 0934958
Principal Investigator: Viji K. Sundar
Email: vsundar@csustan.edu
Institution: California State University, Stanislaus
Presenter(s): Veronica Chaidez, California State University, Stanislaus, vchaidez@csustan.edu
In 2007, the Council on Science and Technology reported that California will need approximately 33,000 science and math teachers in the coming decade. The Robert Noyce Scholarship Program is working hard to prepare highly competent STEM teachers to meet the needs of California’s culturally rich and diverse school populations. Under the theme, Teachers from the Valley for the Valley, 32 CSU Stanislaus students have been accepted to participate in the Robert Noyce Teacher Scholarship Program. Noyce Scholars value the opportunity to work with others who aspire to become the most highly qualified STEM educators. Our passion is amplified and motivated through workshops, meetings and gatherings known as Dine and Dialogues. Through these sessions we share ideas and concerns, listen to professional educators, learn new techniques in the art of pedagogy, and support and encourage each other in our teaching aspirations.

This program blossomed with a common desire of each Noyce Scholar to bring to life the wonder of science, math & technology to future students in a safe and exciting learning environment where a love for knowledge and respect for others will be role-modeled. We have created a professional learning community of university professors, K-12 teachers, mathematicians, scientists and other professional educators. These highly trained mentors have provided invaluable support and boosted our confidence academically and professionally. CSU Stanislaus Noyce Scholars participate in rigorous professional development activities to sharpen their minds and strengthen their teaching abilities. They attend monthly meetings, statewide conferences in the fields of math and science teacher education, participate in summer research internships, gain hands-on early field experience, and receive training in classroom management, common core strategies and educational technology. Noyce Scholars have the opportunity to participate in the Teacher Researcher Academy conducted at Lawrence Livermore National Laboratory. Open to pre-service and in-service teachers, the program offers a continuum of standards-based instruction, enabling participants to progress from novice to mastery in exciting scientific disciplines. Noyce Scholars participate in the STEM Teacher and Researcher Program - STAR. This nine-week summer research internship allows aspiring science and mathematics teachers to work with scientists at one of 15 National Laboratories and gain experience and professional development in the science world.

The CSU system-wide Math and Science Teacher Initiative supports Noyce Scholars by providing early field experience in teaching opportunities, credentialing examination preparation, credential program advising, professional development, faculty mentoring and financial aid advising. Through the Pre-Freshman Enrichment Program (PREP), Noyce Scholars provide support and coaching to students grades 7-9. This summer program is designed to increase interest in STEM fields by offering captivating experiences in science and math, and, promoting intellectual development and critical thinking skills. Noyce Scholars gain early field experience and professional development in the High School Mathematics Access Program, a pre-collegiate STEM focused coaching and mentoring program for students in grades 6-12.

29
Title: Catawba College Noyce Scholarship Program
NSF Noyce Award Number: 1239928
Principal Investigator: Constance Rogers-Lowery
Email: clowery@catawba.edu
Institution: Catawba College
Co-Pl(s): Cyndi Osterhus, Catawba College
John Zerger, Catawba College
Marcy Corjay, Rowan-Cabarrus Community College
Presenter(s): Constance Rogers-Lowery, Catawba College
URL(s): www.catawba.edu/noyce

The Catawba College Noyce Scholars program is a research-driven program with the goal to recruit, prepare, and retain STEM majors in teaching careers by blending academic preparation, professional community-building, and field experiences. To achieve these goals, the Catawba College Noyce Scholarship program will occur in three phases. First, our community college partner, Rowan Cabarrus Community College, will offer 60 Exploratory Internships to increase awareness of teaching careers for STEM majors. The Internship includes an online course in educational technology, the first course required of education majors at Catawba College. Second, 18 Scholars will receive a $18,000 tuition scholarship for their junior and senior years of college to pursue a major in a STEM discipline and licensure in teaching at Catawba College. Third, Scholars will engage in activities that build social and cultural capital in the profession of a STEM field and in education, providing a support network for retention and success during their training and careers in teaching.

These activities include: (1) a cohort-building leadership retreat; (2) a Mentoring Program, where Scholars will engage in field experiences in the classroom of a highly-effective teacher in Rowan-Salisbury School, the local public school system, to familiarize the Scholar with culture of public education, and (3) a Research Internship in an academic or industrial research laboratory to gain experience in the practice of the discipline. During the first year of the program, we have engaged in planning and recruitment. Internships will begin in Summer 2013 and the first cohort of Scholars will enter in Fall 2013. In this presentation, we will detail our plans for the Scholarship Program and report our recruiting efforts so far, including our emphasis on drawing applicants from 2-year institutions.
30  
Title: Central Washington University Robert Noyce Scholarship Program Science and Mathematics Alliance for the Retention of Teachers (SMART)  
NSF Noyce Award Number: 1035514  
Principal Investigator: Martha Kurtz  
Email: kurtzm@cwu.edu  
Institution: Central Washington University  
Co-PI(s): Chris Black, CWU, blackc@cwu.edu  
Tim Sorey, CWU, soreyt@cwu.edu  
Janet Shiver, CWU, shiverj@cwu.edu  
Jan Byers-Kirsch, CWU, jbkirsch@cwu.edu  
Presenter(s): Chris Black, Central Washington University, blackc@cwu.edu  
URL(s): http://www.cwu.edu/cesme/cwu-robert-noyce-smart-program  

In response to a regional and nationwide teacher shortage in secondary science and mathematics, Central Washington University (CWU) in partnership with five community colleges, has implemented a Phase I NSF Noyce Scholars Program to recruit and train STEM majors and STEM professionals to become science and mathematics teachers in high need schools. High priority is placed on recruiting students underrepresented in STEM fields. At the end of the third year of funding, a total of 23 Affiliates will have participated in four types of Affiliate experiences: academic year teaching or research, summer camp teaching, or a month-long summer research experience. The Noyce Summer Research Program involves Noyce Affiliates in four weeks of intensive research in each of four different faculty research labs. The summer 2012 experience included research in computational mathematics, science education, plant genetics, and human genetic variation. A total of 17 Noyce Scholars have participated in teaching, research, and professional development opportunities with nine of them completing a year-long internship. Two Scholars are currently participating in a two-year induction program. The CWU Noyce program has been especially successful at recruiting under-represented students.

31  
Title: Attending National Conferences to Promote Professional Development: Reflections from Noyce Scholars at Chicago State University  
NSF Noyce Award Number: 0833251  
Principal Investigator: Andrea Van Duzor  
Email: agay@csu.edu  
Institution: Chicago State University  
Co-PI(s): Mel Sabella, Chicago State University, msa-bella@csu.edu  
Karel Jacobs, Chicago State University, kjacobs@csu.edu  
Presenter(s): Rita Koziarski, Chicago State University, rkoziars@csu.edu  
URL(s): http://csuteachscience.org  

All of the Noyce Scholars at Chicago State University have attended at least one national professional conference as either a pre-service or in-service teacher. Conferences attended have included NSTA, NARST, AAPT, APS, Noyce National, and Noyce Midwest Regional. The CSU Noyce project has promoted conference attendance as a means of broadening Scholars perspectives of science education and to help them engage in national discussions in the field around key issues in science teaching and learning. The Noyce Scholars at CSU are usually the first college graduates in their family. Most of them come from neighborhoods close to the urban campus of the university and are initially unaware of the importance of professional organizations to teachers in the field. Based on analysis of their post-conference reflections, the Scholars have taken the opportunities provided by the conferences to hear first hand from nationally recognized education researchers and outstanding teachers in the field. They have learned about the latest in instructional materials, technology, and pedagogies and seen the value of establishing relationships with colleagues locally and nationally. Scholars note the importance of conferences in helping them view themselves as professionals rather than students. The poster will document the reflections by the Noyce Scholars after attending the conferences and how the conferences have helped shape the teaching of our scholars who are now in-service.

32  
Title: The City College of New York Noyce Teacher Academy Scholars Program (Noyce TA)  
NSF Noyce Award Number: 1239896  
Principal Investigator: Despina Stylianou  
Email: dstylianou@ccny.cuny.edu  
Institution: City College of NY School of Education  
Co-PI(s): Professor Steinberg, CCNY School of Education, steinberg@ccny.cuny.edu  
Yael Wyner, CCNY School of Education, ywyner@ccny.cuny.edu  
Issa Salame, CCNY Department of Chemistry, salame@sci.ccny.cuny.edu  
Presenter(s): Bruce M. Billig, The City College of NY School of Education, bbillig@ccny.cuny.edu  
URL(s): www.ccny.cuny.edu/education; www1.ccny.cuny.edu/prospective/education/School-of-Education-NOYCE-Teacher-Academy-at-CCNY.cfm  

Recruitment: In fall 2012, information sessions were held for STEM major undergraduates to explain the Noyce TA program requirements, benefits and application procedures. Noyce TA candidates were interviewed by the Project Director and selected for the spring 2013 Noyce TA Pre-Scholars Program. Seven Pre-Scholars were selected and scheduled for a one hour seminar on Fridays and assigned to one of our Noyce TA high schools for their four hours of fieldwork experiences. Course Description – Spring 2013 Syllabus The NOYCE Scholars Teacher Academy identifies qualified math and science undergraduates who aspire to be teachers. Students begin weekly fieldwork clinical experi-
ences in their sophomore or junior year. The NYS Teaching Standards and Common Core Learning Standards are emphasized throughout the program. Each student is partnered with a collaborating teacher in our partner schools. Through a combination of fieldwork experiences, weekly seminars and education courses, aspiring teachers explore effective teaching strategies and how to assess student learning. Seminar activities, reflective writing, creation of a portfolio, field trips, panel discussions and presentations from CCNY faculty are designed to reinforce the above goals. During their senior year, participants will student teach in both middle school and a high school as part of their clinical experience requirement for their NYS Initial Certification. Seminar and Fieldwork Overview Seminar topics, activities, readings, presentations and discussions are designed to reinforce weekly fieldwork experiences and explore the many facets of teaching, improving our recruitment of under-represented minorities, and expanding our internship activities to the high school level. The interns work with students on an individual basis, co-plan and co-teach lessons with an intern partner from education, and participate in faculty-led seminars. Our future work will include mentoring the 5 graduating scholars during their first years of experience in their partner districts, as well as professors in STEM disciplines. These co-curricular activities include conference attendance and presentations at state and regional NCTM, NSTA, and Noyce conferences, teacher panel presentations, and field trips to explore local resources. In the first two years of the TigersTeach program, we had 36 applicants and selected 17 scholars. Of these, 16 scholars are enrolling in or graduating from Clemson’s Master of Arts in Teaching (MAT) program in Secondary Mathematics or Secondary Science; 1 scholar is enrolled in one of Clemson’s dual major programs (Mathematics/Secondary Education). Paid internships provide relevant experience for students who are considering applying to the TigersTeach Noyce program but have not yet fully committed to teaching as a career.

In the Fall of 2012 and Spring of 2013, we have placed 35 interns in afterschool programs working with students in grades 3-6. The interns work with students on an individual basis, co-plan and co-teach lessons with an intern partner from education, and participate in faculty-led seminars. Our future work will include mentoring the 5 graduating scholars during their first years of teaching, improving our recruitment of under-represented minorities, and expanding our internship activities to the high school level.

Title: 2013 Southeastern Regional Noyce Conference
NSF Noyce Award Number: 0733711
Principal Investigator: Lienne Medford
Email: Lienne@clemson.edu
Institution: Clemson University
Co-PI(s): Barbara Speziale, Clemson, bjspz@clemson.edu
Presenter(s): Lienne Medford, Clemson, lienne@clemson.edu
Amy Schaible, Clemson, amyschaible@bellsouth.net

Our poster will highlight the March 2013 Southeastern Regional Noyce Conference, which was held in Greenville, SC for 230 scholars and grant personnel.

Title: TigersTeach Noyce Scholarship Initiative
NSF Noyce Award Number: 1136293
Principal Investigator: Michael Padilla
Email: padilla@clemson.edu
Institution: Clemson University
Co-PI(s): Lisa Benson, Department of Engineering and Science Education, Clemson University, ibenson@clemson.edu
Michelle Cook, Department of Teacher Education, Clemson University, mcook@clemson.edu

The TigersTeach Noyce Scholarship Initiative is a partnership among Clemson University’s Eugene T. Moore School of Education, College of Engineering and Science, and College of Agriculture, Forestry, and Life Sciences in collaboration with partner school districts in South Carolina. The TigersTeach Noyce Scholarship Initiative recruits students presently majoring in engineering, the sciences, and mathematics and/or recent graduates with these degrees to become secondary science and mathematics teachers. In addition, the TigersTeach Noyce Scholarship Initiative provides co-curricular support mechanisms to create a vibrant learning community consisting of scholars, teachers in partner districts, as well as professors in STEM disciplines. These co-curricular activities include conference attendance and presentations at state and regional NCTM, NSTA, and Noyce conferences, teacher panel presentations, and field trips to explore local resources. In the first two years of the TigersTeach program, we had 36 applicants and selected 17 scholars. Of these, 16 scholars are enrolling in or graduating from Clemson’s Master of Arts in Teaching (MAT) program in Secondary Mathematics or Secondary Science; 1 scholar is enrolled in one of Clemson’s dual major programs (Mathematics/Secondary Education). Paid internships provide relevant experience for students who are considering applying to the TigersTeach Noyce program but have not yet fully committed to teaching as a career.

In the Fall of 2012 and Spring of 2013, we have placed 35 interns in afterschool programs working with students in grades 3-6. The interns work with students on an individual basis, co-plan and co-teach lessons with an intern partner from education, and participate in faculty-led seminars. Our future work will include mentoring the 5 graduating scholars during their first years of teaching, improving our recruitment of under-represented minorities, and expanding our internship activities to the high school level.

Title: Robert Noyce CPCK Scholars Program: Computational Pedagogical Content Knowledge at The College at Brockport
NSF Noyce Award Number: 1136332
Principal Investigator: Osman Yasar
Email: oyasar@brockport.edu
Institution: College at Brockport
Co-PI(s): Peter Veronesi, College at Brockport, ___ 
Much has been learned about effective uses of technology to deepen teachers’ pedagogical content knowledge. Today, K-12 organizations promote simulations and interdisciplinary problem solving as part of scientific inquiry. Furthermore, as evidenced in the 2013 release of the NGSS, computational thinking is now being considered as a fundamental skill that is needed by all students, not just computer science majors. We are now charged with the education of a new cadre of science teachers to prepare tomorrow’s generation.

Our project at The College at Brockport will use resources and computational math, science, and technology (C-MST) courses, developed under previous NSF grants, to improve teacher preparation programs at the College. The recent formulation by the educational community of a conceptual framework, namely technological pedagogical content knowledge (TPCK) has now put both science educators and computational scientists on the same path to utilize an interdisciplinary approach to STEM and science teacher education.

There has been measurable success in recent years with software tools that hide the inner workings of a simulation and lessen the need for prerequisite knowledge, yet there still exist major limitations on how to integrate computational pedagogical content knowledge into teacher preparation programs and the K-12 curriculum. Education and STEM faculties from physics, chemistry, earth sciences, biology, and computational sciences will carry out this project. Strong content knowledge (via a STEM degree), extensive field experience (150 hours), student teaching, dual certification (science and special education), computational pedagogy courses, monetary support, and a capstone summer institute will be included in a set of coherent strategies to attract, prepare, and retain STEM majors into teaching careers. STEM students will work along side science teacher candidates and experienced teachers, to develop, test, and demonstrate science modeling examples and lesson plans for K-12 classrooms. Within 4 years, it is expected the project will produce more than 40 science teachers and touch thousands of K-12 students. The curriculum framework and learning modules will be shared with national STEM digital library collections contributing to computational STEM programs nationwide. The project will disseminate its findings and resources through articles, conference papers, and the project’s website.
16. Noyce Scholars participated in the workshop on developing interactive Excel spreadsheets offered by co-PI, April 2013

37
Title: Attracting Liberal Arts STEM Students to Teaching: Challenges and Successes within the Noyce Program
NSF Noyce Award Number: 0934793
Principal Investigator: Catherine A. Roberts
Email: cath2math@gmail.com
Institution: College of the Holy Cross
Co-PI(s): Catherine A Roberts, Danuta Bukatko, Janine Schertz, Daniel Bitran, and Heather Johnson
Presenter(s): Catherine A. Roberts, College of the Holy Cross, croberts@holycross.edu

The goal of the Noyce project at College of the Holy Cross is to increase substantially the number of STEM undergraduates who enter the teaching profession, including students from underrepresented groups. The project consists of (1) opportunities for first- and second-year STEM majors to serve as paid tutors and mentors for local urban public and private school students learning concepts in mathematics and science; and (2) scholarship support for third and fourth year undergraduates enrolled in the Teacher Education Program. As we prepare to enter year five of our project, we reflect on successes and challenges the project team has encountered in implementing the goals of the Noyce Scholarship Program.

38
Title: Noyce Scholars Program at the College of William and Mary: Improving Preparation for High Need Schools
NSF Noyce Award Number: 0833330
Principal Investigator: Paul Heideman
Email: pdheid@wm.edu
Institution: College of William and Mary
Co-PI(s): Heather Macdonald, College of William and Mary, rhmacd@wm.edu
Juanita Jo Matkins, College of William and Mary, jjmatk@wm.edu
Marguerite Mason, College of William and Mary, mmmaso@wm.edu
Virginia Mclaughin, College of William and Mary, vamcla@wm.edu
Presenter(s): Paul Heideman, College of William and Mary, pdheid@wm.edu
URL(s): http://www.wm.edu/as/sciencemathed/noyce/

The College of William and Mary (W&M) has completed four years of a Phase I Noyce Scholars Program to produce 39 new science and mathematics teachers. Awards have been made to 36 Scholars (Years 1-4), and 6-10 new Scholars are entering for Year 5. Scholars have been in mathematics (35%), biology (30%), earth sciences (15%), chemistry (15%), and physics (5%), with three-fourths at the graduate level and one-fourth at the undergraduate level. Our Noyce Program includes (a) two special one-credit academic courses for Noyce Scholars (“How Students Learn” and a Practicum focused on high-need settings), (b) science and mathematics summer internship opportunities for research, curriculum, and professional development for Noyce scholars; and (c) follow-up mentoring and support for graduates. Recruitment of students into STEM teaching at our institution has nearly tripled during our Noyce project thus far, and visibility of STEM teaching careers has increased dramatically.

Research on our Scholars has resulted in changes and improvements in the experiences we offer to prepare students for high need schools in addition to increased mentoring and changes to our selection process. Currently, we are making new efforts to place students in high need schools for student teaching, a challenge for our program because of geographic distance to accessible schools that meet our criteria. We identify these experiences as an important element for long term success in meeting our objectives of placing students in high need settings where they remain after meeting service requirements.

39
Title: Columbus Region Academy of Future Teachers of STEM (CRAFT-STEM)
NSF Noyce Award Number: 1136356
Principal Investigator: Tim Howard
Email: thoward@ColumbusState.edu
Institution: Columbus State University
Co-PI(s): Deborah Gober, Columbus State University, gober_deborah@columbusstate.edu
Kimberly Shaw, Columbus State University, shaw_kimberly@columbusstate.edu
Cindy Ticknor, Columbus State University, ticknor_cindy@columbusstate.edu
Presenter(s): Tim Howard, Columbus State University, thoward@ColumbusState.edu
URL(s): http://uteach.columbusstate.edu/stem/

CRAFT-STEM establishes a recruiting pipeline for future teachers of STEM fields. The program combines a 2-week, residential, summer STEM honors camp to encourage rising high school juniors and seniors to pursue STEM and STEM education fields of study; a summer internship program to interest university freshmen and sophomores in STEM education; a scholarship program to entice students to commit to teaching STEM in high need school districts; and a Connections Seminar to build a supportive mentor network for future teachers of STEM.

40
Title: Drexel University Noyce Scholarship Program Phase II
NSF Noyce Award Number: 0934809
Principal Investigator: Sheila R. Vaidya
Email: vaidyasr@drexel.edu
Institution: Drexel University
Co-PI(s): Donald McEachron, Drexel University, Mceachdl@drexel.edu
The poster will present the program developments of the Drexel University Noyce Scholarship program in Phase II. We will present program highlights, recruitment strategies, teacher retention. We credit the Philadelphia Regional Noyce Partnership for supporting the development of a learning community that has engaged in meaningful inquiry of teacher practice and ways to improve practice addressed towards the goal of student learning. New areas of work such as the role of induction and Master teacher have been identified, and this has positively influenced our work with all teachers.

Teachers across institutions have come together to share lesson plans and engage in collaborative planning. We want this to continue as it has been a positive experience for all teachers. We have provided teachers with professional development opportunities and continue to support them with mentoring and the opportunity to develop their content and pedagogical content knowledge as well as practices for students in high need schools. These highlights will be represented in the poster.

41
Title: Duke University Master of Arts in Teaching Program
NSF Noyce Award Number: 0531966
Principal Investigator: Rochelle Schwartz-Bloom
Email: schwa001@duke.edu
Institution: Duke University
Co-PI(s): Richard Hodel, Duke University, hodel@math.duke.edu
Presenter(s): Alan B. Teasley, Duke University, ateasley@duke.edu
Chris Hewitt, Duke University, smokeyhewitt@gmail.com
URL(s): http://cs8.ecok.edu/~rferd/noyce/home.pdf

The Master of Arts in Teaching (MAT) Program at Duke University is an intensive, one-year program that provides highly-qualified teaching candidates with both a master's degree and graduate-level teaching licensure. Over the past seven years, the Robert Noyce Fellowship has been an integral part of the Duke MAT Program, funding a total of 35 math and science teaching fellows. The Duke Noyce Scholarship Program recruits and prepares highly qualified STEM graduates and mid-career professionals to be leaders in the fields of math and science education and to teach in high-needs school districts. The MAT degree requires a total of thirty-six hours of graduate credit—15 hours in one’s academic discipline and 21 hours in education coursework. As a MAT graduate student, Noyce Fellows gain unparalleled teaching experience through a rigorous 27-week internship at two different high schools within Durham Public Schools. Over the duration of the program, Noyce Fellows develop into highly trained and reflective teachers who excel as leaders both within the classroom and in the teaching profession. Of the first four cohorts of Duke Noyce Fellows, over 70% continued to teach following their two-year minimum commitment.

42
Title: The East Central University Phase I Robert Noyce Teacher Scholarship Program
NSF Noyce Award Number: 0934030
Principal Investigator: Robert Ferdinand
Email: rferdand@ecok.edu
Institution: East Central University
Co-PI(s): Heather Hannah, East Central University
John Bedford, East Central University
Presenter(s): Robert Ferdinand, East Central University, rferdand@ecok.edu

The East Central University Phase I Robert Noyce Teacher Scholarship Program provides $10,000 a year scholarships (for up to three years) for students in the Mathematics Teacher Certification Option. In return, Noyce scholars commit to teach secondary-level math for two years in a high-need U.S. school for each year of scholarship money received. Noyce scholars are selected on the basis of academic merit and financial need. Within the program, Noyce scholars are provided professional development opportunities such as undergraduate research, presentations at conferences and tutoring to freshmen and sophomore math majors.

43
Title: Eastern Washington University Robert Noyce Scholarship Program
NSF Noyce Award Number: 1035510
Principal Investigator: Keith Adolphson
Email: kadolphson@ewu.edu
Institution: Eastern Washington University
Co-PI(s): Heather McKeen, Eastern Washington University, hmckean@ewu.edu
Presenter(s): Keith Adolphson, Eastern Washington University, kadolphson@ewu.edu
URL(s): http://www.ewu.edu/cshe/noyce.xml

The goal of the Eastern Washington University (EWU) Robert Noyce Scholarship program is to increase the number and quality of science and mathematics teachers by encouraging majors in STEM disciplines to become teachers. The program is an EWU/Spokane Public School partnership. Scholarships of up to $16,000 per year are available for up to twelve STEM majors each year. Recipients must complete teaching certification requirements and commit to serving two years as a mathematics or science teacher in a high-need school for each year of support. Scholarship recipients are placed in inquiry-based classrooms working with highly qualified math and science teachers, in high need schools. Scholarship recipients will work directly with EWU faculty and K-12 mentor teachers to deliver highly effective inquiry-based curricula. Applicants are recruited through various avenues including “try teaching” science
internships and opportunities to work with children in after school math and science tutoring programs. Freshmen and sophomore STEM majors are recruited from underrepresented populations for six-week summer internships. Summer interns work with the Kalispel Tribal children doing science and math integrated ecological studies for one week.

During the remaining weeks, the interns work with underserved/underrepresented children in conjunction with the YMCA, Girl Scouts, and Boys and Girls Club. Some of the important elements of the project include: (1) Providing excellent field experiences for scholarship recipients in inquiry and other engaged teaching methods with highly qualified mentor teachers; (2) Placing scholarship recipients in high schools to prepare them for their future teaching experiences; (3) Building on relationships with the Kalispel Tribe and other service agencies serving low-income youth to provide summer internships for students who want to “try teaching”; (4) Providing academic year experiences for science and math students to “try teaching”; (5) Developing scholarship recipients into a professional learning community, so they can continue to support each other while teaching; (6) Offering personalized professional development and curriculum development services to mentor teachers, thus improving their capacity to teach with methods shown to increase student learning; and (7) Graduating our first cohort of scholars (8) this year.

44
title: Elizabeth City State University Noyce Scholars Program: Year 2
NSF Noyce Award Number: 1035454
Principal Investigator: Farrah Jackson
Email: fmjackson@mail.ecsu.edu
Institution: Elizabeth City State University
Co-PI(s): Adetayo Adedeji, Elizabeth City State University
Presenter(s): Farrah Jackson, Elizabeth City State University, fmjackson@mail.ecsu.edu

The Elizabeth City State University (ECSU) Noyce Scholars Program is committed to producing 16 highly qualified STEM educators in Northeast North Carolina. ECSU is completing its third year of a Phase I Noyce Scholars program and has awarded scholarships to 8 students; in addition, in April the Noyce Advisory Board selected 5 additional Noyce Scholars who will make up the third cohort and begin receiving awards in the Fall.

ECSU Noyce Scholars have been recruited from STEM majors in biology (2), chemistry (2), and mathematics (9) and 92% of the scholars are members of an underrepresented minority group. To date, ECSU has graduated two Scholars who are both employed in high need schools in ECSU’s 21 county service area; one Noyce graduate is working in a Noyce partnership school which is located just 15 miles from the university. Another Scholar will graduate on May 11, 2013 and two more are scheduled to graduate during the 2012-2013 academic year.

During summer 2012, the second cohort of Noyce Summer Scholars participated in a program designed to give freshman and sophomore STEM majors an opportunity to experience firsthand the joys and challenges present in STEM education. Noyce Summer Scholars were trained on how to effectively use technology to engage students and taught numerous inquiry-based science and mathematics lessons that incorporated technologies such as the Dual Ranger Sensors, Colorimeters, and motion sensors in two summer middle school programs. Students were tasked with reflecting on what they learned daily through written prompts in Blackboard and video blogs.

The Preparation of Highly-qualified Advanced STEM Educators (PHASE) Program is an optional academic year program available to all Scholars. This year’s PHASE activities included sessions on effective uses of technology in teaching, developing and teaching hands-on and inquiry based lessons, and research in STEM education. PHASE participants were able to apply the techniques they researched during ECSU’s Research Week, and again when they traveled to Winston-Salem State University for the North Carolina Science Festival, where they taught a variety of inquiry-based lessons for middle and high school students. PHASE participants also attended regional mathematics and science conferences and a workshop on using Vernier products to teach mathematics and science. A PHASE participant, in conjunction with the Noyce PI, presented her research on “Using the SMARTboard to Engage Students” at the North Carolina Council of Teachers of Mathematics Annual Conference.

During the Spring, the experienced Noyce Scholars who are participating in the PHASE program have been working with faculty mentors to develop the curriculum for the Noyce Summer Scholars Program. These scholars will continue to participate and teach in the Noyce Summer Scholars program but will serve as mentors to the freshman and sophomore Summer Scholars. The third year of the ECSU Noyce Scholars program was filled with a variety of exciting activities. During the poster session, initial findings from the students’ experiences in the Noyce Summer Program and the PHASE program will be shared. Success and challenges associated with recruiting and supporting Noyce Scholars will also be discussed.

45
title: Elon Noyce Scholars Program
NSF Noyce Award Number: 1136399
Principal Investigator: Jeffrey Carpenter
Email: jcarpenter13@elon.edu
Institution: Elon University
Co-PI(s): Janice Richardson, Elon University, richards@elon.edu
Anthony Crider, Elon University, acrider@elon.edu
Presenter(s): Jeffrey Carpenter, Elon University, jcarpenter13@elon.edu
URL(s): http://www.elon.edu/noyce
As a part of our recruitment strategy, we arrange paid education-related internships for first- or second-year students who express interest in STEM disciplines. Internships provide experiences that strengthen participants’ STEM expertise and foster interest in education; the intention is that many interns will later apply for Noyce scholarships. The internships include a variety of settings and experiences. Some interns serve as teaching assistants for programs offered by the Elon Academy, a college-access program for local students with financial need and/or no family history of college. Other interns serve as teaching assistants for summer introductory mathematics and science classes at Alamance Community College, and some are placed in summer STEM programs run by the local, high-need Alamance-Burlington School System. These internship opportunities provide valuable experience working with students who attend schools in high-need districts. Because many of our students are from out-of-state, interns also have the option to arrange internships near their hometown. Interns have worked with the summer Jump Start Math program run by Delaware County Community College and supported educational programming at the Brookside Nature Center in Wheaton, MD.

This summer we will have interns working in Virginia, Tennessee, and Maryland. To enhance the quality of the internship experience, a $180 stipend is provided to a STEM education mentor at each internship site. Two-year scholarships encourage talented STEM majors to complete a Teacher Education program to earn licensure (grades 9-12) in addition to their Bachelor’s degree in Mathematics or one of the Sciences. Three cohorts (approximately 6 students per year) receive a $21,900 scholarship during both their junior and senior years. They benefit from Elon’s close relationship with the Alamance-Burlington School System; field experiences in its high-need high schools will prepare them to fulfill their teaching obligations. Their program is supplemented with special experiences, including documented extra mentoring by university and secondary-school educators.

Finally, our Scholars will be required to teach for four years in a high-need school district. During their induction into the teaching profession, they will receive face-to-face and virtual mentoring from secondary-school and Elon faculty, and financial support for professional development activities and purchase of classroom materials.

46

Title: Co-Teaching between STEM Mentor Teachers and Pre-Service Teachers: Preparation for Student Teaching and Beyond

NSF Noyce Award Number: 1136394
Principal Investigator: Shelton Ford
Email: sford2@uncfsu.edu
Institution: Fayetteville State University
Co-PI(s): Perry Gillespie, Fayetteville State University, pgillespie@uncfsu.edu
Kimberly Smith-Burton, Fayetteville State University, ksmith@uncfsu.edu

Creating a pipeline of highly qualified STEM K-12 Teachers will ensure our competitiveness as a nation. Fayetteville State University’s (FSU) Preparing Future Educators for Placement in K-12 Mathematics and Science Classrooms (PrEP) Noyce Scholarship Program utilizes a mentorship approach to prepare pre-service teachers for the student teaching experience and beyond. Mentors and Noyce Scholarship participants attend monthly seminars focused on self-awareness and the use of technology in the classroom, as they relate to the Common Core Standards and North Carolina Essential Standards in Mathematics and Science. FSU’s Noyce Scholars, who are pre-service candidates, co-teach with their respective mentors and are required to reflect upon the experience.

The goal of the pre-service candidate’s co-teaching experience is two-fold. First, the experience expects to utilize the mentoring model to create a seamless transition to the student teaching capstone course. Also, the goal is to expose the pre-service teacher to the development and design of lesson plans, to create self-awareness and actualization and how this awareness impacts their interaction with students, and to the meaning of professional development and how their definition evolves over time. Research on mentoring indicates that mentoring can increase the retention rate of teachers. One of the most important pre-service experiences is student teaching. Being a mentor teacher for a pre-service candidate requires time, commitment, flexibility, and extensive collaboration.

Details of how the FSU’s Noyce pre-service candidates and her or his mentor enter into a rich and important relationship prior to the student teaching experience will be shared, a relationship that may last years into the future and that influences both teaching careers and the new teacher’s need for guidance and acceptance as a developing professional. Current processes and data will be shared regarding the effectiveness of this experience and how it has changed and impacted FSU’s program participants’ readiness for teaching in the STEM classroom. FSU is a constituent institution of the University of North Carolina and the second-oldest public institution of higher education in the state. Founded in 1867 as the Howard School for the education of African Americans, today FSU serves a growing student body of over 6,300 and ranks among the nation’s most diverse campus communities.

47

Title: GEMS: Institutionalizing Education Reform through Florida International University’s Noyce Project

NSF Noyce Award Number: 0833300
Principal Investigator: Julian Edward
Email: edwardj@fiu.edu
We will present results from the fourth year of the GEMS (Get Educators in Mathematics and Science) project at Florida International University (FIU), a public urban research Hispanic-serving institution in Miami. GEMS recruits top students in Chemistry, Earth Sciences, Mathematics, and Physics courses and provides new pathways into science and mathematics teaching. GEMS has supported a number of scholars as well as serves as the driving force behind FIU’s new discipline-based teacher preparation programs and expansion of the Learning Assistant (LA) program across mathematics and the sciences. Following a transitional period in the first two years of the grant, during which the relevant educational degrees migrated to their disciplinary homes, the grant has now supported 25 Noyce Fellows. The LA program provides explicit opportunities for top STEM discipline majors to enter the teaching career while providing a vehicle for education reform of introductory science and mathematics courses. FIU supported 163 LAs in Spring 2013, making it the largest LA program in the nation. Results including program and curricular designs, insights from the LAs and Noyce Scholars, as well as highlights of FIU’s institutionalization of the LA program will be provided.

48
Title: Fostering Student’s Awareness of Culturally Specific Patterns of Communication in High Needs Environments
NSF Noyce Award Number: 0934702
Principal Investigator: Joseph Travis
Email: jtravis@fsu.edu
Institution: Florida State University
Presenter(s): Wilbert Butler, Tallahassee Community College, butlerw@tcc.fl.edu

A main focus of our Noyce program is to provide the students with experiences to foster their awareness of culturally specific patterns of communication to better prepare them for teaching in high need schools. This poster presentation focuses on the views of the Noyce preservice teachers regarding their exposure to culturally relevant activities as a part of preparing them for teaching in a high needs environment. One of the greatest sources of uncertainty for teachers is whether they will be able to connect with students and build productive relationships (Lottie, 1975; Metz, 1978; Nias, 1989). Providing support relevant to teaching in a high needs environment is critical in preparing new teachers. Hollins and Guzman (2005) describe a study that found that a large majority of teacher candidates had “limited experience with those from cultures other than their own and few had long-term interaction with people of other races and cultures. Findings indicated that these teacher candidates did not feel prepared to teach students from diverse backgrounds” (p. 482). Lottie (1975) who analyzed the “endemic uncertainties” of teaching concluded “uncertainty is the lot of those who teach” (p. 133). Supporting and retaining teachers is likely to be an even greater undertaking, particularly in low-income and low-performing schools (Johnson and Birkeland, 2003). The preservice teachers were asked to respond to the following prompt: What are your feelings/views as to how the activities of the mentoring process may or may not have prepared you for teaching in a high needs environment?

49
Title: Fordham University/Wildlife Conservation Society Robert Noyce Teacher Scholarship Program
NSF Noyce Award Number: 1035391
Principal Investigator: John Craven
Email: jcraven@fordham.edu
Institution: Fordham University/Wildlife Conservation Society
Co-PI(s): John Craven, Fordham University, jcraven@fordham.edu
Deborah Luckett, Fordham University, luckett@fordham.edu
Grace Vernon, Fordham University, vernon@fordham.edu
Presenter(s): John Craven, Fordham University, jcraven@fordham.edu
Deborah Luckett, Fordham University, luckett@fordham.edu
Grace Vernon, Fordham University, vernon@fordham.edu
URL(s): http://www.fordham.edu/academics/colleges__graduate_s/graduate__profession/education/admissions__financia/financial_aid/gse_school_based_aid/scholarship__grant_g/science_education_sc_78023.asp

The Fordham University/Wildlife Conservation Society (WCS) Robert Noyce Teacher Scholarship Program is designed to incentivize (through scholarship and other supporting funds) talented STEM majors and professionals to become science teachers in high-needs, public schools. According to the 2008 Annual Report, the Noyce Foundation seeks to improve the potentiality of the lives of children in large part by strengthening the science instruction they are provided in K-12 educational systems particularly through informal science. That mission deeply resonates with the design of a unique science teacher preparation program launched in New York City in the year 2008 through a partnership between the Graduate School of Education at Fordham University and the Wildlife Conservation Society/Bronx Zoo. These institutions, each a nationally renowned leader in education, have combined their expertise, institutional resources and leadership capacities to design and offer a nationally first-of-its-kind, New York State-approved Master of Science in Teaching program in science education that leads to New York State initial teacher certification in Adolescence biology/Conservation Life Science Education (grades 7-12). The Fordham University/WCS Noyce Scholarship program expands current partnership efforts
to encourage talented science majors and professionals to become 9-12 science teachers through a synergistic program of recruitment, education, support and induction. In doing so, this project responds to a well-documented need of highly qualified science teachers particularly in disadvantaged, high-needs urban schools. The project leverages the programmatic assets of the partnership and the awarded funds to ignite rapid growth of the new 5th Year Track science education program developed. In doing so, we fulfill the Fordham mission of serving the educational needs of urban schools in partnering districts in and around New York City.

50
Title: Noyce Teacher-Leaders for Western Kansas
NSF Noyce Award Number: 1239991
Principal Investigator: Gavin Buffington
Email: gbuffing@fhsu.edu
Institution: Fort Hays State University
Co-PI(s): Paul Adams, Fort Hays State University, peadams@fhsu.edu
Janet Stramel, Fort Hays State University, jkstramel@fhsu.edu
Bill Weber, Fort Hays State University, bweber@fhsu.edu
Presenter(s): Bill Weber, Fort Hays State University, bweber@fhsu.edu
URL(s): http://www.fhsu.edu/noyce/

As a new Noyce awardee, Fort Hays State University (FHSU) (a rural, comprehensive 4 year university located in Hays, KS) has been focusing on recruiting efforts to improve the depth of the applicant pool of STEM majors pursuing teaching at the K-12 level. To accomplish this end, FHSU used a two-tiered approach to increase the number of STEM majors considering teaching: 1) Noyce Summer Scholars for freshmen and sophomores, and 2) active recruitment both on and off campus for the Junior/Senior Noyce scholarships. For the Noyce Summer Scholar internship program, FHSU offers many STEM-related summer camps for Noyce scholars. For the Noyce Summer Scholar internship program, FHSU offers many STEM-related summer camps for students (not necessarily in the teaching track) to come to FHSU for 6 weeks during the early part of the summer to live at FHSU and intern for the summer camps. Coupled with the teaching experience are weekly seminars, reflection, and discussions about a STEM teaching career as a means of recruiting these individuals to STEM teaching and hopefully future application for the Noyce Scholarship.

The second strategy was to actively recruit STEM majors to teaching. In the past FHSU has not done this; students effectively would “fall” into a teaching major. As part of our recruitment effort, 26 presentations to nearly 500 students were made to on-campus STEM classes explaining both the Noyce scholarship as well as teaching as a career path. To increase numbers in the applicant pool, our mentor teacher made numerous trips to 6 area community colleges which feed geographically into FHSU. During these visits, he made 28 presentations to over 200 students. During our first year of recruiting, we had 14 applicants for the Noyce Scholar program, 2 of which were from area community colleges. For the summer internships, we had 20 applicants, of which 6 were from area community colleges. 4 of the 6 summer internships were awarded to students in area community colleges (not currently attending FHSU); we will be interested to see how many of these students end up at FHSU majoring in a STEM discipline (and/or teaching).

51
Title: Noyce in Northern Virginia
NSF Noyce Award Number: 1240031
Principal Investigator: Mary Nelson
Email: mnelso15@gmu.edu
Institution: George Mason University
Co-PI(s): Cody Edwards, GMU, cedward7@gmu.edu
Reid Schwebach, GMU jschweba@gmu.edu
Len Annetta, GMU, lannetta@gmu.edu
Shelley Jaye, NVCC, sjaye@nvcc.edu
Presenter(s): Mary Nelson, George Mason University, mnelso15@gmu.edu

Though the Noyce grant at Mason and NOVA is only six months old, the project is well underway. Our method of recruiting Noyce Scholars is a learning assistant (LA) program, based on the successful program at CU Boulder. We have already hired more than 40 LAs in the first year. These students work with other undergraduates in courses that they have already successfully completed. Primarily, they facilitate oral reviews, assist in classes and labs, and run help sessions. Though only two students are currently recipients of Noyce funding, the LAs’ opportunities to have early teaching experiences have already led more than ten students to inquire about Noyce Scholarships.

Our LAs Assistants attend a Teaching and Learning Seminar in their first semester in the program where they discuss issues such as discourse, wait-time, learning styles, how to use rubrics and formative assessment. The sessions are conducted by Noyce PIs and senior personnel from five STEM disciplines in addition to Education faculty. These seminars also give LAs a place to voice concerns and questions while reporting on successes and challenges. LAs commit ten hours weekly to the program. In addition to the seminar and a weekly meeting with their supervisor, each LA is given at least 5-6 hours a week of interaction with students. LAs use the remaining time to prepare. Some attend the course and work in the classroom alongside the instructor. Others prepare through completing the students’ homework assignments and quizzes. LAs report improved understanding of course material and often cite their LA experience as the highlight of their week. After successful completion of an LA position, Mason students may apply for a Noyce Scholarship. Besides teaching experience, Noyce Scholars will be given opportunities to do educational research and to present at
national conferences. NOVA students may become learning assistants at the community college, and then will receive transition assistance through Noyce personnel and can become Noyce Scholars after one additional semester as a LA at Mason. We already have three times as many faculty applications as we can fund. This allows us to choose the best experiences for our LAs and Noyce Scholars. A recent information session brought a plethora of new LA applications. Enthusiasm for the program is flourishing, and we hope to have at least five new Noyce Scholars in the fall.

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Title: Lessons Learned From Scholars Lost

NSF Noyce Award Number: 0833265
Principal Investigator: James Lobue
Email: bkoeloobue@GeorgiaSouthern.edu
Institution: Georgia Southern University
Co-PI(s): Michelle Cawthorn, Georgia Southern University, mcawthor@georgiasouthern.edu
Joy Darley, Georgia Southern University, jdarley@georgiasouthern.edu
Marlynn Griffin, Georgia Southern University, mgiffin@georgiasouthern.edu
Brian Koehler, Georgia Southern University, bkoehler@georgiasouthern.edu
Presenter(s): Brian Koehler, Georgia Southern University, bkoehler@georgiasouthern.edu
URL(s): http://cosm.georgiasouthern.edu/students/smart-scholarship/

Certainly as PIs and Co-PIs in the Noyce Scholarship Program, we would like to attract new public school teachers who are ideally suited to the profession and are likely to remain in the classroom for the next 30 years. However, our role as Noyce grant administrators is more intricate than one would imagine. While we are apprehensive at the prospect of not meeting our scholar quota, our teacher candidates are worried about their suitability for the classroom. A scientific formula is insufficient to make accurate decisions regarding our scholar selections. What criteria should we use to deny an applicant admission to the program? What rule should we use to cut off the funds for one apparently doomed to fail? There may be indicators in the application process, or in our scholars’ early performance, that could predict future success or failure for our scholars. Our program has lost several scholars at varying stages. Case studies of these teacher candidates will be presented along with retrospective insights obtained from interviews with the former scholars after leaving the program. The information provided should prove useful to future Noyce PIs.

53

Title: Managing Large Sets of Data in a Phase II Project

NSF Noyce Award Number: 1136303
Principal Investigator: Christine D. Thomas
Email: cthomas11@gsu.edu
Institution: Georgia State University
Co-PI(s): Pier A. Junor Clarke, Georgia State University, pjunor@gsu.edu
Draga Vidakovic, Georgia State University, dvidakovic@gsu.edu
Janice B. Fournillier, Georgia State University, jfournillier@gsu.edu
Presenter(s): Janice B. Fournillier, Georgia State University, jfournillier@gsu.edu
Christine Thomas, Georgia State University, cthomas11@gsu.edu
URL(s): http://umep.coe.gsu.edu/

The Robert Noyce Urban Mathematics Educator Program at Georgia State University developed and executed a virtual learning environment (VLE) for the purpose of fostering effective mathematics teaching and in promoting retention of high performing teachers in urban high need schools. Over a two-year period, the VLE known as Second Life was the main meeting place for our community of Noyce Scholars. These VLE meetings were synchronous. Additionally, the scholars participated in asynchronous threaded discussions through a Google Group and used a Wiki to post and share resources. Data were collected in the form of video recordings of the VLE meetings, threaded discussions from the Google Group, artifacts from the Wiki, interviews with scholars, a variety of surveys, and video and audio recordings from face-to-face meetings. In this poster session, we share our techniques for managing large sets of data in the monitoring and evaluation of a Phase II project.

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Title: Hampton University Noyce Scholars Program for Future Biology and Mathematics Teachers

NSF Noyce Award Number: 0934715
Principal Investigator: Carolyn B. Morgan
Email: carolyn.morgan@hamptonu.edu
Institution: Hampton University
Co-PI(s): Clair Berube, Hampton University, clair.berube@hamptonu.edu
Presenter(s): Carolyn B. Morgan, Hampton University, carolyn.morgan@hamptonu.edu
Clair Berube, Hampton University, clair.berube@hamptonu.edu
URL(s): http://science.hamptonu.edu/math/noyce/

Hampton University (HU) has completed three years of a Phase I Noyce Scholars Program for future biology and mathematics teachers. The HU program is designed to recruit and prepare talented STEM majors and professionals to become mathematics and biology teachers in high-need school districts. The HU Noyce Teacher program provides scholarships, stipends, and academic programs for undergraduate STEM majors and post-
baccalaureate students holding STEM degrees who commit to teaching in the high-need school districts. As an undergraduate biology or mathematics major, a Noyce Teacher Scholar can receive scholarship funding during the junior year, senior year and one year of graduate study. Current scholarship funding will cover the cost of attendance which is approximately $28,000 per academic year for an undergraduate student. In addition, a student can also receive a $2,700 stipend for participating in the internship program in the summers.

To date, we have graduated one Noyce Teacher Scholar with a Master of Arts in Teaching in Biology who is currently employed by Spotsylvania County Schools as an Advanced Placement and Advanced Biology teacher for Courtland High School. In May 2013, we will graduate our second Noyce Teacher Scholar with a Master of Arts in Teaching in Mathematics. Her current plan is to return to her home state of California and teach in a high-need school district. A third scholar will obtain her Bachelor degree in Mathematics in May, and she will stay at HU to complete the Master of Arts program in mathematics. Two other scholars anticipate completing their Bachelor’s Degree in biology in May 2014 and then starting the Master of Arts in Teaching in fall 2014. Our Noyce scholars are involved in some interesting and rewarding summer internships. One scholar served as an educational guide at the Richmond Science Museum, a premier center for hands-on science education in Virginia. Our scholar worked as a guide and assisted visitors and summer camp students with the interactive exhibits on health, energy, cutting edge technology and natural science. Another scholar worked at the NASA Langley LARSS Summer of Innovation (SoI) program. The Noyce Scholar worked with NASA Office of Education specialists and educators at summer camps, youth organizations, charter schools and churches to engage the underrepresented and underserved Hampton Roads middle school students in STEM activities.

This poster will highlight some of the summer internship program activities and some of the educational research investigations which the scholars are conducting.

55
Title: Noyce STEM Teacher Education in the Arkansas Delta (N-STEAD)

Hendrix College’s Noyce STEM Teacher Education in the Arkansas Delta (N-STEAD) program will recruit and prepare 19 STEM majors to teach in secondary high-need schools (grades 7-12) in the Arkansas Delta, in addition to supporting them during their first two years of teaching. The two major initiatives of the program are the N-STEAD Scholars program and the N-STEAD Internship. The N-STEAD Scholars program recruits STEM majors into teaching by significantly reducing the cost of teacher licensure. While the STEM and Education departments ensure the strength of content and pedagogy in the curriculum, newly re-focused coursework and new science-based preservice apprenticeships in high-need areas reduce the cultural barriers to novice teacher success and persistence in their first high-need placement. A required two-year induction mentoring program provides on-site assessments and offers tailored assistance in content, pedagogy, and Delta culture from the Hendrix STEM and Education faculty, and Delta-based master teachers. The N-STEAD Internship allows freshman and sophomore STEM majors to teach within an informal STEM context. Students are introduced to the academic field of science education through planning lessons, presenting science to children, and assessing the outcomes through participation in a low-risk environment—the science outreach program known locally as Ridin’ Dirty with Science.

56
Title: Hofstra University Noyce Program and Partner Schools

The purpose of our poster is to show case a Noyce Fellow demonstrating the law of conversation of angular momentum using a bicycle wheel in a pre-service science methods class. The poster will also highlight a former Noyce Scholar teaching a mathematics lesson in a high needs school and a profile of current Noyce Scholars and Fellows.
The project’s primary aim is to increase the number of qualified K-12 STEM educators in New York City (NYC), as well as statewide and nationally. We will achieve this goal by recruiting and cultivating a largely untapped population of potential candidates. Hostos Community College (Hostos) and Lehman College (Lehman) are part of the City University of New York, the nation’s leading urban public university serving more than 480,000 students at 24 colleges and institutions in NYC. Both institutions have a long-standing tradition of serving primarily Hispanic, African-American, and other student populations that are currently underrepresented in the STEM disciplines; in fact, almost 97% of current Hostos students fall into this category. A Robert Noyce Capacity Building Project grant would enable us to provide a pathway for Hostos and Lehman chemistry and environmental science majors to become STEM teachers in high-need schools. Hostos and Lehman are thus uniquely well-positioned to identify, attract, and educate exactly those STEM teaching candidates most lacking in the urban teaching population.

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Title: Indiana State University Noyce Scholars Conduct an Analysis of the Article, “Steering to the Mathematical Point” by L. Sleep
NSF Noyce Award Number: 0934648
Principal Investigator: Carolyn Wallace
Email: carolyn.wallace@indstate.edu
Institution: Indiana State University
Co-PI(s): Eulsun Seung, Denise Collins, Rusty Gonser, and Elaina Tuttle, Indiana State University
Presenter(s): Carolyn Wallace, Indiana State University, carolyn.wallace@indstate.edu

A key component of our Noyce Scholarship activities at Indiana State University is reading contemporary articles on high needs, math or science education and discussing the articles on-line. In Spring 2013, we read a contemporary article in the American Educational Research Journal, by Laurie Sleep (2012) entitled, “Steering Instruction Toward the Mathematical Point.” The research article described a study of elementary student teachers teaching mathematics lessons in order to identify key elements of effective mathematics teaching. After reading the article, our group described key points about the theoretical framework, methods, results and conclusions. We also offered critical analyses of the meaning of the research. It was engaging for us to discuss concrete vignettes of practice and apply them to our current teaching situations. This poster will highlight major points of the article and what we learned from the group study activity.

59
Title: Deepening the Pool at Indiana University
NSF Noyce Award Number: 0630424
Principal Investigator: Enrique Galindo
Email: egalindo@indiana.edu
Institution: Indiana University
Co-PI(s): Kevin Pilgrim, Indiana University, pilgrim@indiana.edu
Presenter(s): Enrique Galindo, Indiana University, egalindo@indiana.edu

Deepening the Pool focuses on recruiting high quality students into two of Indiana University Bloomington’s (IUB) mathematics teacher preparation routes. Both programs are grounded in strong mathematics preparation, cutting edge pedagogy, diverse school-based field experiences in grade 6-12 school environments, and educational research reflecting inquiry-based learning and teaching. The project team brings extensive experience with all aspects of mathematics teacher education, including student recruitment, mathematics content preparation, instruction in pedagogy, field-based experiences, and evaluation and assessment. As a result, Deepening the Pool has produced well prepared, confident mathematics teachers, eager to serve in high need schools. Through Deepening the Pool recruitment efforts, IUB is broadening and extending the number and diversity of students we prepare as secondary teachers of mathematics, and is assisting these highly-qualified individuals in finding teaching positions in high-need Indiana schools.

Our Noyce scholars are prepared to serve as instructional leaders in using technology and inquiry-based approaches to mathematics teaching at all secondary-school levels. They will be future mentors for teaching peers in their buildings, as well as for future Noyce scholars. Our research and dissemination efforts will share the results of this project both locally and nationally, through peer reviewed publications and presentations at conferences. We have worked with five cohorts of Noyce scholars and we recently recruited our sixth cohort. This new cohort consists of two graduate students and one undergraduate student.

60
Title: Indiana Noyce Science Scholars: Teachers for a New Decade
NSF Noyce Award Number: 1035234
Principal Investigator: Robert Sherwood
Email: rdsherwo@indiana.edu
Institution: Indiana University Bloomington
Co-PI(s): Caty Pilachowski, Indiana University Bloomington, catyp@astro.indiana.edu
Presenter(s): Robert Sherwood, Indiana University Bloomington, rdsherwo@indiana.edu
URL(s): http://education.indiana.edu/undergraduate/cost-aid/scholarships/science-education-scholarships.html
Faculty from the Indiana University Bloomington School of Education and the College of Arts and Sciences have partnered with local school districts in the Indiana Noyce Science Scholars: Teachers for a New Decade project. This project was funded in 2010 and is in its third full year of operation. Partner school corporations include Bartholomew Consolidated Schools, Monroe County Community Schools, North Daviess Community Schools, North Lawrence Community Schools and Paoli Community Schools; all in southern Indiana. All of these districts are considered high-needs. The Indiana Noyce Science Scholars project offers three different avenues for students to pursue teacher licensure. The first program is a joint BS/MS program where a student can complete a BS in a science area in the College of Arts and Sciences and an MS in Secondary Education in the School of Education in five years. A second program is the Secondary Transition to Teaching program where post-baccalaureate students attend an intensive 11 month program that prepares them for teacher licensure and provides them with 18 graduate credit hours. The third program is Community of Teachers, which has a strong clinical emphasis where a student will work intensely with a classroom teacher over a minimum of three semesters along with taking graduate coursework.

The project activities have focused on recruitment of students to apply for the Noyce Scholarships as well as collecting student and project data. They include: (1) Updating the website with information and online application. (http://education.indiana.edu/noyce); (2) Preparing flyers for distribution to science departments on campus and mailed to all colleges/universities in the state; (3) Assisting in the preparation program for the current year (2012-13) cohort of Scholars; (4) Processing applications for the 2013-14 cohort of Scholars; (5) Following-up with the first cohort of Noyce Scholars (nine) who completed their programs in May, 2012; and (6) Collecting data on the characteristics of the first set of Scholars through both project personnel and the external evaluator. Objectives for the next year of the project include: (1) Increase communication with minority serving undergraduate institutions to increase minority scholars; (2) Continue communication with both internal and external audiences; (3) Work with the external evaluator for continued review of the program; and (4) Recruit with a scholarship goal of 12 students.

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Title: Noyce Teach Science @ IUPUI: Broadening Options, Broadening Participation
NSF Noyce Award Number: 0733788
Principal Investigator: Kathleen A. Marrs
Email: kmarrs@iupui.edu
Institution: Indiana University Purdue University Indianapolis
Co-PI(s): Kim Nguyen, IUPUI, knguyen@iupui.edu
Presenter(s): Mariah Judd, Department of Biology, IUPUI, juddm@iupui.edu
Kim Nguyen, IUPUI, knguyen@iupui.edu
Kathleen A. Marrs, IUPUI, kmarrs@iupui.edu
URL(s): http://www.iupui.edu/~ucase/scholarships/teachscience/

To attract more STEM students into the profession of teaching, we expanded the options of our Noyce Teach Science grant. Our original option, to simultaneously earn a B.S./B.A. in a science related field AND a secondary teaching certificate during the undergraduate years at IUPUI, was broadened in three ways: (1) Adding two additional areas of need in Indiana eligible for the Noyce Scholarship: Mathematics and Technology Education, expanding the option of the Noyce Scholarship to new populations of students; (2) Adding a new route to certification, allowing students to earn a B.S./B.A. first, then enter the 1 year post-baccalaureate T2T program immediately following graduation; (3) Expanding the Noyce Summer Internship program. Together, these three strategies have allowed us to greatly expand the number of Noyce Scholars at IUPUI.

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Title: Urban Educators: Robert Noyce Scholarship for Mathematics and Science Teachers - Phase II
NSF Noyce Award Number: 0934555
Principal Investigator: Kim S. Nguyen
Email: knguyen@iupui.edu
Institution: Indiana University Purdue University Indianapolis
Co-PI(s): Kathleen A. Marrs, IUPUI, kmarrs@iupui.edu
Jeffrey X. Watt, IUPUI, jwatt@iupui.edu
Presenter(s): Kim S. Nguyen, IUPUI, knguyen@iupui.edu
URL(s): http://www.iupui.edu/~ucase/

Noyce II Scholars at IUPUI are enrolled in the Transition to Teaching (T2T) program for STEM professionals. The scholars will complete 18 graduate credits or one half of the MS requirements and two-semester field experiences for teacher licensures in the sciences or mathematics at secondary level (grades 6-12) in one calendar year. The T2T program builds on the established collaboration between two schools: Science & Education in partnership with high-need school districts in Marion County, including Indianapolis Public Schools. The original Robert Noyce Program (DUE-0531598) has successfully prepared 34 highly qualified science and math teachers for the urban high-need classrooms in Indiana since 2007.

Noyce Phase II has three objectives: (1) continue to increase the number of secondary science and mathematics teachers--10 teachers each year, with an emphasis on the recruitment of individuals from ethnic minorities, (2) enhance retention of novice teachers by providing ongoing mentoring for the new teachers, and (3) implement a longitudinal evaluation plan to assess the effectiveness of the Noyce Teacher Scholarship program at IUPUI. Noyce Phase II fell short of its enrollment goal. The implementation of Phase II coincided with the initiation of the highly competitive Woodrow Wilson Indiana Teaching Fellowship. This
Title: Ithaca College Robert Noyce Teaching Scholarship Program

The Robert Noyce Teaching Scholarship Program at Ithaca College is a combined effort among the Departments of Education, Mathematics, and Physics to identify motivated students in the first two years of undergraduate study, facilitate their exploration of teaching as a career, and provide the opportunity to become full Noyce scholars in their senior year and in our Master of Arts in Teaching program. We will outline the full program and show how it is designed for the scholars (and potential scholars) to have repeated high-need school experiences, gain discipline-specific, pedagogical, and pedagogical content knowledge, and engage in professional development and mentoring. We will highlight key features of the program, including summer research opportunities, partnerships with high-needs rural and urban schools, linking courses that explore the connections between the content of their undergraduate courses and the K-12 curriculum, and participation in professional societies.

Title: The K-State Robert Noyce Scholarship Program

The K-State Robert Noyce Scholarship Program is a Phase I program designed to increase the supply of highly qualified middle and high school teachers (Grades 6-12) in biology, chemistry, earth and space science, and physics. The program seeks to: (1) provide opportunities for 25 freshmen and sophomores to work in informal STEM education settings both on and off campus; (2) increase by 17 the number of undergraduates in the targeted STEM disciplines receiving licensure; and (3) enable 12 graduates in the targeted STEM disciplines to gain licensure through a newly established Graduate Certificate in Teaching and Learning. High needs schools high needs schools have been identified and recruited through three existing partnerships: the Professional Development School Partnership, the Center for Intercultural and Multilingual Advocacy, and the Center for Rural Education and Small Schools. These targets schools serve a high percentage of individuals from families with incomes below the poverty line, a high percentage of English language learners (ELLs), and/or rural populations. The program is managed by a leadership team with members from Education, Chemistry, Biology, Physics and Geology. The evaluation plan includes the development of a database for maintaining demographic data; the Scholars’ academic progress and perceptions of the usefulness of the program elements; the effectiveness of program elements, especially new teacher support; and subsequent teaching challenges in high need schools. We have now graduated 8 students who are all employed in high-needs schools throughout Kansas with another 12 scholars presently in the program.
This Teacher Recruitment Initiative in Physics and Chemistry program is a collaboration between Kennesaw State University (KSU) and Georgia Tech (GT). With Noyce funding, it initiated a program to encourage and enable GT and KSU undergraduate science and engineering majors to pursue careers in high school chemistry and physics teaching. Candidates received funding during their senior undergraduate year, and/or during their enrollment in KSU’s 15-month chemistry and physics MAT program. During the six years of the program, the Robert Noyce Teacher Recruitment Initiative provided 1-2 year scholarships to 52 science and engineering majors. The poster will highlight the results of the program and will provide a snapshot on the enrichment activities that the program conducts during the school year.

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Title: Evaluating a Robert Noyce Scholarship Program Using a Web-Based Collaboration Site
NSF Noyce Award Number: 1035451
Principal Investigator: Greg Rushton
Email: grushton@kennesaw.edu
Institution: Kennesaw State University
Co-PI(s): Samuel Polizzi, Kennesaw State University, sjpolizzi@gmail.com
Taha Mzoughi, Kennesaw State University, tmzoughi@kennesaw.edu
Presenter(s): Christopher Cappelli, Georgia Institute of Technology, chris.cappelli@ceismc.gatech.edu
URL(s): https://web.kennesaw.edu/noyce/content/i-impact-noyce-track-ii

This poster presents the utilization of a web-based collaboration site for the purpose of evaluating the Kennesaw State University (KSU) Initiative to Increase and Mentor Physics and Chemistry Teachers (I-IMPACT) Noyce II program evaluation. The KSU Noyce II scholarship program aims to implement aggressive, focused, and intentional efforts to attract both STEM undergraduates and professionals into K12 teaching careers. KSU Noyce II supports participants who are STEM professionals or undergraduates who enroll as Teaching Fellows (TFs) in master’s degree programs leading to teacher certification and the development of Master Teaching Fellows (MTFs) by providing professional development and salary supplements for exemplary mathematicians and science teachers to become Master Teachers.

This project is a 5-year program that will reach a total of 16 new secondary physics and chemistry TFs and 16 MTFs recruited from throughout the Metro Atlanta region. Online collaboration sites can be used as an authentic assessment to provide evidence of participants’ experience with the program. The web-based collaboration site is designed to track Noyce Fellows growth as teacher leaders using longitudinal formative and summative data collection methods. Using a web-based collaboration site enables the evaluation team to observe teacher experiences with the program, and to document the growth of teacher leadership skills throughout the program. Additionally, the web-based collaboration site serves as a mechanism for tracking the Noyce Fellows as they fulfill their teaching obligation, and a useful method for collecting demographic and program progress data on these individuals. Through the web-based collaboration site, the evaluation team is able to observe the disposition toward reflection as part of becoming a teacher leader. This poster presents the advantages of using a web-based collaboration site for data triangulation, and the challenges experienced when implementing the site as a part of the Noyce Program evaluation.

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Title: Who’s Teaching Our Nation’s High School Chemistry Students: An I-IMPACT Intervention
NSF Noyce Award Number: 1035451
Principal Investigator: Greg Rushton
Email: grushton@kennesaw.edu
Institution: Kennesaw State University
Co-PI(s): Samuel Polizzi, Kennesaw State University, sjpolizzi@gmail.com
Taha Mzoughi, Kennesaw State University, tmzoughi@kennesaw.edu
David Rosengrant, Kennesaw State University, drosengr@kennesaw.edu
Brett Criswell, Georgia State University, bcriswell@gsu.edu
Presenter(s): Samuel Justin Polizzi, Kennesaw State University, sjpolizzi@kennesaw.edu

Kennesaw State University (KSU) has been awarded two Noyce projects to recruit, prepare and retain STEM majors and professionals into secondary K-12 teaching careers. Unique among Noyce II programs, the KSU Initiative to Increase and Mentor Physics and Chemistry Teachers (I-IMPACT) focuses on the physical sciences. The I-IMPACT goal to improve the chemistry teacher workforce is guided by our analysis of the US Schools and Staffing Survey (SASS), conducted by the National Center of Educational Statistics. By performing a longitudinal analysis of six teacher surveys spanning 1993-2007, and disaggregating the data into Chemistry, STEM and non-STEM disciplines, we examine the extent to which Chemistry teachers can be treated as homogeneous with the STEM teacher workforce. We report that a sustained increase in STEM educators over the period studied is not reflected in the Chemistry teacher workforce. Our data indicated that approximately 70% of all Chemistry teachers did not hold a Chemistry degree at any level during the years surveyed. At the same time, we observe a decrease in the number of Chemistry degree-holding teachers with main assignments in...
Chemistry, and a concomitant increase in the number with biology degrees. Similar to STEM and non-STEM educators, the Chemistry teacher workforce is becoming (i) both younger and older, (ii) less experienced, (iii) more diverse, and (iv) more female. I-IMPACT is responding to destabilizing trends in the Chemistry teacher workforce by (i) recruiting highly qualified undergraduates and career changing STEM professionals for (ii) subject specific training in KSU’s Master of Arts in Teaching (MAT) Chemistry Program. Outside of the MAT program, Noyce Scholars and Teaching Fellows interact with experienced Master Teaching Fellows at I-IMPACT professional development events, with the aim of expediting their trajectory toward teacher leaders.

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Title: Increasing Mathematics Teachers for ALL Students
NSF Noyce Award Number: 0934791
Principal Investigator: Desha Williams
Email: dwill178@kennesaw.edu
Institution: Kennesaw State University
Co-PI(s): Karen Kuhel, Kennesaw State University, kkuhel@kennesaw.edu
Belinda Edwards, Kennesaw State University, bedwards@kennesaw.edu
Adrian Epps, Kennesaw State University, adrian-epps@kennesaw.edu
Presenter(s): Karen Kuhel, Kennesaw State University, kkuhel@kennesaw.edu
David Turk, Kennesaw State University, dturk@students.kennesaw.edu
Desha Williams, Kennesaw State University, dwill178@kennesaw.edu
URL(s): https://web.kennesaw.edu/noyce/

There is a need for all teachers to be prepared to educate all students effectively in mathematics, including those who have limited English proficiency (Thomas & Collier, 2001). However, a small minority of teacher preparation programs actually prepare mainstream teachers to teach English learners (ELs) (Lucas, Villegas, & Freedson-Gonzalaz, 2008; Samson & Collins, 2012). Frequently, ELs are placed in mathematics classrooms while still in the early stages of learning English (Abedi, Courtney, Leon, Kao, & Azzam, 2006). The rationale has been that mathematics is a universal language. However, this rationale is not valid. Mathematics in K-12 classrooms is not focused on only numbers and equations; it also requires significant literacy skills (Moschkovich, 2012; Short & Fitzsimmons, 2007). Teachers who are prepared to teach culturally and linguistically diverse students are better equipped with the knowledge, skills, and disposition to academically challenge all students. The Increasing Mathematics Teachers for ALL Students (IMTAS) project is designed to encourage and enable candidates with strong mathematical backgrounds to pursue careers in high school mathematics teaching while simultaneously focusing on innovative pedagogical techniques that combine best practices in social justice, culturally responsive pedagogy, and language support for non-native speakers of English. At the completion of the IMTAS program, candidates are certified to teach secondary mathematics and have an opportunity to earn an endorsement to teach ELs. The project just completed its fifth year. We currently have 15 scholars and 15 graduates. Graduates teach in high needs schools, and 10 graduates hold the ESOL Endorsement. Data has been collected from workshop surveys, interviews, application information, classroom assignments, and an attitudinal survey. Currently the project investigators are examining a) the impact of culturally and linguistically responsive pedagogy on graduates’ practice; b) how the program impacts cultural dispositions of graduates; c) the enactment of cultural dispositions in the mathematics classroom; and d) conceptualization of the design of culturally and linguistically relevant mathematical tasks.

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Title: Kent State University’s Noyce Connections and Partnerships
NSF Noyce Award Number: 1136377
Principal Investigator: Lisa Donnelly
Email: ldonnell@kent.edu
Institution: Kent State University
Co-PI(s): Joanne Caniglia, Kent State University
Andrew Tonge, Kent State University
Presenter(s): Joanne Caniglia and Lisa Donnelly

The primary goal of the Kent State University Noyce Scholarship Program is to increase the number of qualified STEM teachers through Service Learning while engaging future teachers in civic engagement projects. To accomplish this goal, each Noyce Scholar not only participates in service learning projects with community partnerships, but also use course content that is aligned with the NSF Science Education for New Civic Engagement and Responsibility (SENCER). This poster session will visually show this application and alignment of course content and resources from SENCER, but also display a myriad of community partnerships that are established through the Noyce Program. These include the incorporation within informal settings such as supporting Upward Bound, the All American Soap Box Derby Curriculum, the Akron Zoo, Glenn NASA, and the Cleveland Science Center educational outreach programs. Results of the Student Assessment of Learning Gains (SALG) will be presented in qualitative form. The SALG survey allows students to rate how specific activities in SENCER courses help their learning. The assessment tool also asks students to report on their confidence in science skills, their interest in science activities, and the civic activities in which they have been engaged. Initial results suggest that although Noyce scholars are positive regarding their experiences, more engagement with schools of higher need is requested.
Title: Mathematics and Science Teacher Education Recruitment (MASTER) Program at Lehman College

NSF Noyce Award Number: 0833317
Principal Investigator: Gaoyin Qian
Email: Gaoyin.Qian@lehman.cuny.edu
Institution: Lehman College

Co-PI(s): Serigne Gningue, Liesl Jones, and Gillian Bayne
Presenter(s): Serigne M. Gningue, Lehman College, serigne.gningue@lehman.cuny.edu
Julissa Soriano, Lehman College, jsoriano20@hotmail.com
Gaoyin Qian, Lehman College, gaoyin.qian@lehman.cuny.edu

The poster demonstrates how Lehman College Noyce Scholars were inducted into teaching mathematics and science through mentoring by college professors, supervisors, and their mentors at school. Multiple assessments provided important and timely feedback about Noyce Teachers’ teaching, which helped the professors and administrators of the Noyce Scholarship Program to respond to the needs of Noyce Teachers in a timely manner. Results of the Employer Survey, Classroom Observations, Program Evaluation, and lesson-based interviews will illustrate how data informed the decision making.


NSF Noyce Award Number: 1136395
Principal Investigator: Cecelia Traugh
Email: cecelia.traugh@liu.edu
Institution: Long Island University Brooklyn

Co-PI(s): Sara Salloum, LIU-Brooklyn, sara.salloum@liu.edu
Anthony DePass, LIU-Brooklyn, Anthony.DePass@liu.edu
Presenter(s): Sara Salloum, LIU-Brooklyn, sara.salloum@liu.edu
Gaoyin Qian, Lehman College, gaoyin.qian@lehman.cuny.edu

Recruiting and retaining qualified STEM teachers in high needs urban areas remains a significant challenge. New teachers find transitioning into demanding urban teaching difficult which in turn leads to attrition. LIU-Brooklyn’s (LIU-B) Scholarship and Excellence in Secondary Science Education (SE SSE) partly addresses the above issues by recruiting qualified science majors from the local urban communities in Brooklyn. Research shows that teachers coming from local communities are more likely to stay in teaching even when serving in demanding situations. LIU-B SE SSE prepares these science degree recipients through a rigorous M.S.Ed program that includes traditional teacher training courses, science content reinforcement, participation in scientific research activities, as well as extended mentorship and professional development.

The LIU-B SE SSE program utilizes a theoretical framework that develops teachers’ knowledge in three domains relevant to urban teaching: (A) formal and academic, (B) craft, and (C) practical-moral. Formal knowledge includes understandings of science, its nature, and foundations and theories of education and urban education (e.g., socio-cultural and political dimensions, and pedagogical content knowledge [PCK]). This is built through coursework, a summer science research course, and post-graduation professional development. Craft knowledge includes organizational and management competencies to run smooth classrooms. It is built through a yearlong mentored residency/internship in the classroom. As the year progresses, teaching responsibilities are gradually increased with accompanying support from classroom mentors as well as the guidance and support of program faculty. Scholars cultivate their practical-moral knowledge (P-MK), including dispositions and commitments essential to teaching diverse student through being immersed in teaching and learning situations and in collaborative critical reflections. P-MK is developed through coursework in disciplined teacher inquiry. In this poster, we present preliminary exploration of how the scholars’ sense of efficacy to teach science shifted after the first year of the program. The first year included education and science courses as well as a yearlong residency/internship year in science teachers’ classrooms. We also present preliminary results about the scholars’ perceptions about the conduciveness of program supports in enhancing their sense of efficacy for science teaching. The poster also presents challenges that scholars identify as they anticipate the transition to becoming science teachers in urban settings. The scholars are expected to obtain their own teaching positions in the year after the yearlong residency/internship.

Title: Louisiana Tech University, The Robert Noyce Teacher Scholarship Program: The Past, the Present, and the Future

NSF Noyce Award Number: 0733825
Principal Investigator: Kelly Crittenden
Email: kelleyC@latech.edu
Institution: Louisiana Tech University

Co-PI(s): Dawn Basinger, Louisiana Tech University, College of Education; dbasing@latech.edu
Presenter(s): Melanie Gleason, Louisiana Tech University, College of Education; melanie@latech.edu

The Robert Noyce Teacher Scholarship Program has been a very effective vehicle for increasing the number of certified, secondary teachers in northern Louisiana who are not only proficient in their STEM content area but are passionate about teaching in one of the STEM disciplines. We at Louisiana Tech University have been involved with this scholarship program since 2008. Students recruited for this program enter through one of two pathways: 1) As an undergraduate in the senior year of their baccalaureate degree program, graduating with a degree in one of the STEM disciplines, or 2) As a professional—one who has already graduated with a baccalaureate degree in one of the STEM disciplines. Thus far, 22 students have enrolled in this pro-
The Noyce Scholar Program at Marquette University uses an engineering co-operative education model, adapted to prepare engineering, science and mathematics students for careers as STEM teachers. This unique co-operative education model includes intensive field experiences in education (i.e., teaching co-ops) integrated with university-based instruction that meets the Wisconsin standards for STEM teacher licensure. The first teaching co-op, which occurs during the Noyce scholars’ junior year, is a full immersion experience at a high-need high school. Noyce scholars take nine credits of education coursework onsite while assigned to a math or science classroom. Scholars function as both classroom teachers and instructional student teaching semesters. During the summer, they work closely with teachers in their classrooms, discuss learning issues and consider diversity. Classroom teachers offer support and mentoring as scholars develop their skills to work competently with diverse students in group settings. The second teaching co-op takes place during the scholars’ fourth or pre-senior year at a high-need secondary school. The experience focuses on the unique skills that the scholars must acquire to become effective STEM teachers and is linked to a general methods course and a middle-secondary science or mathematics methods course. During this time, scholars grapple with how instruction is specifically designed with consideration of both the content and the learners being taught, as well as effective strategies for delivery. In the fifth year, Noyce scholars participate in their third and final teaching co-op which is a traditional student teaching semester. The scholars are under the direction of an assigned classroom cooperating teacher and a university mentor. Teaching co-ops provide an alternative pathway for preparing high-quality STEM teachers for work in high-need urban schools. The co-op design provides the supports STEM majors need to learn how to think about the content they know well through an educational perspective that focuses on teaching and learning. The integrated co-op approach emphasizes both content knowledge and pedagogical content knowledge, providing opportunities to consider education coursework through the lens of actual classroom experiences. Accordingly, STEM undergraduates are scaffolded in developing a particularly strong foundation of knowledge for teaching, which facilitates the transition of students from successful STEM undergraduates to effective STEM teachers.

The Michigan Tech Noyce Scholars Program has provided scholarships for 11 STEM majors and 7 STEM professionals. The program emphasizes building learning communities, strong content knowledge, and development of skills essential to teaching in high-needs schools. Most scholars come from rural communities to attend a university in a rural region over 200 miles from any metropolitan area. As a result, they are typically unfamiliar with the challenges and opportunities of teaching in urban districts. To build student understanding, the program developed a partnership with Saginaw City Public Schools and Saginaw Valley State University (SVSU) (450 miles away) to provide scholars with an intensive weeklong field experience in a Saginaw secondary school. During Michigan Tech’s spring break, scholars work closely with teachers in their classrooms, discuss learning issues with SVSU faculty, and interact with community members and school administrators. School districts are willing to host scholars for student teaching. Partner universities provide much of the pre-service and in-service mentoring of scholars; Michigan Tech faculty provide pre-service instruction, as well as an online mentoring course for new teachers and their mentors. The success of the spring break field experience in sensitizing students to the learning issues of urban students and in encouraging them to embrace the challenge of teaching in high needs schools remains unclear. Some scholars are excited about helping to develop the potential of these students. Others are more inclined to use the experience to reinforce their preconceptions about the problems facing urban schools.
The Millersville University Noyce Scholars Program seeks to increase the number of highly-qualified mathematics teachers teaching in high-need school districts. The challenge for mathematics teacher education programs is to develop strategies to prepare the preservice teacher with the theory, skills, and aptitude to teach all students (Gardner, 2005). The program provides Millersville’s mathematics education majors with a greater opportunity to develop those necessary skills. Our first cohort of scholars began Fall 2012 and included five undergraduate level scholars. Recruitment, advertising, and word of mouth have resulted in an increase in the number of applicants for our second cohort of scholars that will potentially join us Fall 2013. Based on responses from this year’s applicants, our scholars were valuable recruitment tools as they discussed our program with friends, classmates, and students in target classes. While nurturing a scholars program, we are creating a sense of community among scholars and faculty. Our scholars engage in experiences designed to enrich their overall education. In addition to guest speakers, round table discussions, and webinars, they participate in an action research project related to reasoning and sense-making in mathematics classrooms. The scholars are creating tasks which foster habits of reasoning and will conduct a presentation and poster sessions at the 2013 annual meeting of the Pennsylvania Council of Teachers of Mathematics. Our Noyce program has a partnership with a local secondary high-needs school which indicated a need for volunteers to assist with remediation of their students. As part of the requirements of the program, our scholars serve as tutors/teacher aides within the high school. Additionally, our scholars participate in the Philadelphia Urban Seminar, an existing Millersville University program that immerses students in an urban school setting, under the supervision of Millersville University and School District of Philadelphia professionals. The program is an intensive two-week for-credit experience that introduces students to the unique needs of urban schools and the positive cultural aspects of urban students, with the goal of helping preservice teachers gain a more complete and positive view of working in urban schools. As a result, they gain additional field experience beyond their degree requirements.

Open the Gate is a partnership between ten San Francisco East Bay school districts and Mills College’s Division of Natural Sciences, Mathematics and Psychology and the School of Education. Our goals are to: (1) increase recruitment of female undergraduate STEM majors, STEM professionals, and recent college graduates into STEM teaching professions in area middle and high schools; (2) offer comprehensive mentoring and support for STEM trained teachers; and (3) evaluate the factors influencing recruitment, preparation and retention of Open the Gate Scholars. The project includes a research project to study the Mills’ model of teacher education and the factors within it that support our teacher graduates’ high retention rates in urban high-needs schools. One component of our Noyce Teacher Scholars project is the engagement of mathematics and science pre-service and in-service teachers in research projects that we hope sustain teachers as learners. We wished to uncover and highlight those experiences that allow our graduates to develop an inquiry approach to urban teaching within a collaborative, reflective frame grounded in an ethic of care and to maintain an orientation towards social justice. We hypothesized that such lenses would positively impact new teachers’ success and longevity as STEM educators in high poverty schools. We will discuss two common research practices in the program: Pre-Service Lesson Study, and In-service classroom-based inquiry projects related to completion of our master’s degree with an emphasis on teaching. Lesson Study is an integral part of the mathematics and science teaching curriculum at Mills. We will report on the experiences of Scholars as they participated in Lesson Study as a teacher “owned” process of inquiry. We will also discuss the subsequent reflections on Lesson Study by graduates as teachers of record. Our graduates are also invited to prepare a classroom-based inquiry project during the first five years as teacher of record as an important part of the MEET master’s degree program. Several Open the Gate Scholars have completed or are currently completing such projects. We report on those experiences as an amplification of the inquiry stance gained in the pre-service year.
**Title:** NYU Noyce Program Exceeds its Goal Recruiting New Science and Math Teachers

**Principal Investigator:** Linda T. Coats

**Email:** LCoats@colled.msstate.edu

**Institution:** Mississippi State University

The Noyce STEM Teachers Scholars Program at Mississippi State University: Meeting STEM Educational Demands is a Phase 1 project that seeks to develop and prepare STEM teachers who have both a strong content knowledge and ample pedagogical skills to become highly effective and qualified middle-high school mathematics and science teachers. The program emphasizes the importance of building partnerships with teacher education, STEM disciplines, and school districts to provide Noyce Scholars with a comprehensive teacher preparation program. The poster presentation will describe how the project is meeting the STEM educational demands of students in high-need school districts and highlight the success stories of Noyce Scholars and Noyce Teachers, insight from partnering school districts, and lessons learned from implementing the project’s goals.

**Title:** NYU Noyce Program Exceeds its Goal Recruiting New Science and Math Teachers

**Principal Investigator:** Pamela Fraser-Abder

**Email:** pa1@nyu.edu

**Institution:** New York University

The New York University (NYU) Noyce Scholarship Program undertook to recruit and prepare 27 new math and science teachers for high-needs US public schools over 5 academic years. Now as the program comes to an end, it has exceeded its goal, having recruited 28 Noyce Fellows. All NYU Noyce Fellows were STEM-major undergraduates at the NYU College of Arts and Sciences or NYU Poly. The Program has prepared them for careers as teachers in high-needs US schools by providing: 1) a sense of secondary school teaching as a good career path for scientists and mathematicians; (2) participation in teacher preparation courses and seminars while undergraduates; 3) authentic secondary classroom experiences while undergraduates; and 4) accelerated preparation leading to teacher certification. The Program results in Master’s Degrees in Secondary Math or Science Education and initial teacher certification in New York State after one year of graduate course work, done residually in a public school. It assists with job placement upon graduation and supports early career teachers. Noyce Scholars who complete the program assume an obligation to teach for at least two years in a high-needs US school. NYU Noyce Fellows have included 9 in the Biological Sciences, 8 in Chemistry, 9 in Mathematics, and 2 in Physics.

**Title:** Recruit and Engage Math and Science Teachers (RE-MAST): Year 4

**Principal Investigator:** Christina Mccartha

**Email:** christina.mccartha@newberry.edu

**Institution:** Newberry College

Newberry College is dedicated to preparing high school math and science teachers through its Recruit and Engage Math And Science Teachers (RE-MAST) program, a collaboration between the biology, chemistry, math and education departments, and 3 high need SC school districts. In Year Four of RE-MAST, a Master Teacher, strong in math content, has been hired to work specifically with the RE-MAST Program. The Master Teacher uses her own classroom experiences to provide support to RE-MAST teacher candidates and prospective students. The Master Teacher is in charge of science and math education recruitment with assistance from science, math and education faculty, organizing the scholar and summer intern recruitment activities, organizing summer internship experiences, and serving as liaison to partner high need school districts for RE-MAST activities. Additional duties include working with education, math, and science faculty to recruit teacher mentors for the Master Mentors program and matching Master Mentors with summer interns. Lastly, the Master Teacher will provide induction support to RE-MAST graduates out in the field.

Specifically, the RE-MAST program will recruit, prepare and mentor 26 math, biology and chemistry majors pursuing teaching in STEM content areas. In addition, RE-MAST will recruit 34 freshmen and sophomore STEM majors to participate in 6-week, paid summer internships to investigate teaching through field experiences and an education course for credit. Interns will be encour-
aged to apply for the 26 scholarships available during their junior, senior, or 5th years. The program will actively recruit and encourage STEM career changers interested in teacher certification to apply as well. RE-MAST has selected 12 STEM teachers from the 3 high need school districts to participate in the Master Mentor program thereby enhancing the infrastructure for education. They received mentor training that counted towards professional development hours. Mentors will work with RE-MAST interns, scholarship recipients and graduates for their 2-year service obligation. The Master Mentor program promotes teaching, training, and learning by pairing RE-MAST students with highly trained mentors in their content area to help them develop their skills as teachers in the classrooms within high need schools. The poster session will provide an overview of progress made in Year Four.

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Title: Kenan Master Teaching Fellows: Linking Research Experiences and Curriculum Development with Leadership

NSF Noyce Award Number: 0934658
Principal Investigator: Ruben Carbonell
Email: ruben@ncsu.edu
Institution: North Carolina State University
Co-PI(s): Susan Parry, Kenan Institute for Engineering, Technology & Science at N.C. State University, susan_parry@ncsu.edu
Presenter(s): Craig Tucker, Kenan Institute for Engineering, Technology & Science at N.C. State University, Craig_Tucker@ncsu.edu
URL(s): http://kenanfellows.org/

The goal of the Kenan Fellows Program’s Master Teaching Fellows program is to select, build, and support a network of highly trained and influential master STEM teachers as part of a concerted effort among several high needs school districts, local institutions of higher education, and community organizations. In-service Kenan Master Teaching Fellows from high-need schools in the eleven-county BRAC-Region (Base Closure and Realignment Commission) have completed two-year fellowships and have now transitioned into their role as “master teachers” in their districts. Kenan Master Teaching Fellows have and will continue to engage pre-service programs in partner institutions of higher education as well as their respective school districts in the BRAC-Region to help cultivate and better equip the next generation of educators.

81
Title: PRIME: Preparing Regional Increases in Mathematics Educators

NSF Noyce Award Number: 0934709
Principal Investigator: Teri Jo Murphy
Email: murphytj1@nku.edu
Institution: Northern Kentucky University
Co-PI(s): Bethany Noblitt, Northern Kentucky University, noblittb@nku.edu
Gina Foletta, Northern Kentucky University, foletta@nku.edu
Brooke Buckley, Northern Kentucky University, buckleyb1@nku.edu
Sarah Kasten, Northern Kentucky University, kastens1@nku.edu
Presenter(s): Bethany Noblitt, Northern Kentucky University, noblittb@nku.edu

Northern Kentucky University (NKU) selects talented undergraduate students interested in mathematics education and prepares them to be fully qualified, well-prepared teachers of secondary mathematics in high-need schools. NKU provides them on-going support during their early teaching years. The project is a collaboration between NKU, the Kentucky Center for Mathematics (KCM), and three school districts: Covington Independent and Newport Independent Schools in Kentucky and Cincinnati Public Schools in Ohio. The project supports two-year scholarships to a minimum of 28 academically talented students in their junior and senior years and summer internships for up to 30 rising freshman and sophomores.

The program includes the following elements: an aggressive recruiting plan; opportunities for incoming freshmen and rising sophomores to engage in summer experiences designed to stimulate their interest in becoming secondary mathematics teachers working in high-need schools; two-year scholarships for academically talented students in their junior and senior years; an outstanding teacher preparation program including valuable enhancements that foster a community of learners and expose participants to contemporary literature on and effective practices in the teaching and learning of secondary mathematics; and mentoring support for program graduates. A first group (six students) of incoming freshmen and rising sophomores participated in summer internships during summer 2010. A second group (three students) interned in summer 2011. These summer internships included opportunities such as working as undergraduate researchers under the mentorship of faculty members, participating in grant-funded professional development and coursework for in-service teachers, and/or assisting with summer camps sponsored by NKU’s Center for Integrative Natural Sciences and Mathematics (CINSAM).

In summer 2013, interns will work alongside scholarship recipients to lead a CINSAM summer math camp for middle grades students. Since spring 2010, we have had six cohorts of students, a total of 19 students. Enhancements for the scholarship students have included participation in numerous state, regional and national conferences including: the Kentucky Council of Teachers of Mathematics Conferences, KCM Conferences, the National Council of Teachers of Mathematics (NCTM) Annual and Regional Meetings. Other enhancements provided for the students included: teacher panel discussions about “Teaching High School Mathematics in High-Need Schools,” a session presenting the impact of KY Senate Bill 1 and the new mathematics standards on teaching high school mathematics, and a semester-long study of how TI-Nspires can be used to enhance student understanding of mathematical concepts.
Title: Mathematics Studio Classroom: Transforming a School's Culture of Mathematics Professional Learning

NSF Noyce Award Number: 0934953

Principal Investigator: Thomas Dick

Email: tpdick@math.oregonstate.edu

Institution: Oregon State University

Co-PI(s): Linda Foreman, Teachers Development Group, linda.foreman@teachersdg.org

Rebekah Elliott, Oregon State University, elliottr@onid.orst.edu

Presenter(s): Thomas Dick, Oregon State University, tpdick@math.oregonstate.edu

URL(s): https://www.teachersdg.org/

Mathematics Studio provides a framework for structuring a mathematics professional learning community in a school. It is a greenhouse for both the professional development of all mathematics teachers (including preservice Noyce Teaching Fellows) as well as for leadership development (Master Teaching Fellows).

What is a Mathematics Studio? Envision a teacher (the Studio Teacher) and several school colleagues (the Studio Residents) gathered around a table to collaboratively plan for instruction in the Studio Teacher’s classroom. The Residents are other teachers of mathematics from the school, the principal, school specialists such as SPED and ELL, and visiting preservice interns. Residents do the math together, anticipate student conceptions and strategies, clarify mathematics learning goals, debate and strengthen the cognitive demand of the mathematical task, and identify, rehearse, and plan for the implementation of specific “Mathematically Productive Teaching Routines” that will engage students in relevant and productive mathematical practices and discourse. They use structured protocols and supporting tools to focus their planning and dialogue.

Next, the Studio Teacher enacts the plan “live” in her classroom, while the Residents observe and record student discourse data using specified data tools that focus their attention on key features of mathematically productive student discourse. Immediately following the classroom enactment, the group debriefs by examining the discourse data and students’ written work and then engaging in structured inference dialogue about relationships among: the math content; students’ mathematical generalizations, justifications, and use of relevant Common Core State Standards mathematical practices; the lesson design; and instructional moves. Specific tools and protocols support reflection and dialogue that always include generalization by all participants regarding next steps for their individual and collective practices. A coach works closely with the Studio Teacher and Residents to press for reflection and support instructional decision-making, to facilitate the group’s use of specific tools and protocols, to coach side-by-side with the Studio Teacher during the public rehearsal of specific practices, to make the nuances of selected instructional moves and decisions transparent to the observers, and to coach, model, and make transparent the features of highly productive professional dialogue.

Initially, this coach is an external consultant—over time, as the structures and protocols become internalized and deprivatization through coached public rehearsals become the norm, local teacher leaders take over studio facilitation. Thus, the studio model is both scalable and sustainable.

Title: Pacific STEM Teaching Pathways: Catalyzing Innovation in Community-Based STEM Teacher Preparation

NSF Noyce Award Number: 0934599

Principal Investigator: Kevin Carr

Email: kcarr@pacificu.edu

Institution: Pacific University

Co-PI(s): Juliet Brosing, Pacific University, brosing@pacificu.edu

Presenter(s): Kevin Carr, Pacific University, kcarr@pacificu.edu

URL(s): http://www.pacificu.edu/coe/stem

Pacific STEM Teaching Pathways Noyce Scholarship Program has catalyzed the inception, development, and implementation of a community-based model of STEM teacher preparation. Community-based teacher preparation is driven by local stakeholders with a vested interest in the education of local teachers, including school districts, 2- and 4-year higher education institutions, local business and industry leaders, local government entities, and other community agencies and groups engaged with children and youth. Pacific University Noyce Scholars, based in the small community of Woodburn, OR, engage in innovative clinical teaching experiences at the local library, city park restoration sites, and at the local Latino leadership institute. Coursework is
planned and co-taught by university faculty and school district teachers. NSF Noyce support has made possible the development of the Pacific Woodburn clinical STEM teaching site, where Pacific University has assumed regional leadership in preparing the next generation of Oregon’s STEM teachers.

85
Title: Connect2Science: Through Nature Review of a Pre-Service/In-Service training for Elementary Teachers on the Implementation of the Framework for K-12 Science Education
NSF Noyce Award Number: 0934885
Principal Investigator: William Becker
Email: beckerw@pdx.edu
Institution: Portland State University
Presenter(s): Stephanie Wagner, Center for Science Education, Portland State University, christina.m.schull@gmail.com
URL(s): http://www.pdx.edu/cse/mst

A course of study was developed utilizing outdoor settings to create inquiry-based work samples designed to highlight the Scientific and Engineering Practices and Crosscutting Concepts outlined in the Framework for K-12 Science Education. Post-survey results and interviews demonstrated that teachers felt an increased sense of confidence about teaching science and that they had gained practical strategies and knowledge for engaging students to use higher order thinking skills. Many participants shared that this sense of confidence meant that they are willing to test and refine units of inquiry-based science instruction with an accepting mind towards the fact that revisions will be necessary. Participants specifically shared that they planned to teach the unit of instruction developed in the workshop and would apply what they learned to develop and teach additional outdoor education units of instruction. Another important learning outcome for the groups of educators was to expand their concepts of the nature of science. Many of the participants shared that they came to the workshop with a very narrow perspective of what it means to engage in science and who is able to authentically engage in the scientific process of discovery. Several reported that prior to participating in the workshop they were unaware that they held such a narrow view and that their misconceptions were serving as a barrier to their practice. Prior to participating in the workshops, many of the elementary teachers held a misconception that science is proscribed step-by-step process beginning with the formation of a hypothesis and ending with a formal defense of findings. They were not aware that authentic science includes many ways of knowing including simply making careful observations about the natural world.

86
Title: Rio Salado College’s Innovative Noyce Scholars Post-Baccalaureate Teacher Preparation Program
NSF Noyce Award Number: 1136435
Principal Investigator: Janet Johnson
Email: janet.johnson@riomail.maricopa.ed
Institution: Rio Salado College
Co-PI(s): Shannon Corona, Rio Salado College, shannon.corona@riosalado.edu
Presenter(s): Karen Nave, Rio Salado College, karenl.nave@riosalado.edu
URL(s): www.riosalado.edu/noyce

A nationwide shortage of qualified math and science teachers has led to sustained local, state, and federal efforts to recruit and retain additional teachers in these areas. The Rio Salado College (RSC) Science and Math Innovative Learning Environments (SMILE) Program for Encore Careers in Education will support the recruitment and training of 40 STEM professionals to aid their transition into teaching careers in 7th-12th grade math and science classrooms in Arizona. Working with STEM-related industries in Arizona, Rio Salado College will identify STEM professionals who are interested in transitioning to teaching careers and assist them in meeting eligibility requirements and applying to the program. Successful applicants will complete a comprehensive 15-month teacher certification program (based on the college’s Post-Baccalaureate Teacher Preparation Program) with online course instruction and onsite student teaching experiences in conveniently located school districts. RSC will also provide mentoring and professional support to SMILE participants as they fulfill the required teaching commitment in high-need schools. The primary goal of the SMILE program is to increase the number and quality of math and science teachers available to high-need schools in Arizona. During the first year of the program, nine (9) Post-Baccalaureate STEM Professionals have been recruited and have begun the program. Each Noyce Scholar has received a stipend of $16,500 which helps to cover tuition, books, fees and some cost of living. The hybrid format of the SMILE program has allowed scholars to continue working as they complete online coursework, minimizing the financial impact of participation in the program and potentially limiting the period of unemployment to the time required for onsite student teaching. RSC has partnered with school districts and STEM industry to recruit and train STEM professionals who are re-careering to teach math or science in Arizona 7th-12th grade classrooms. This first cohort of outstanding STEM professionals from Arizona industry brings their STEM expertise and real life experiences to our students. The RSC Noyce Scholars Program is committed to helping transition these STEM professionals as well as train them in pedagogy, student engagement, classroom management, and other 21st century teaching strategies. Rio Salado is currently partnered with over 16 districts throughout Arizona which help
provide recruitment opportunities (including rural districts) as well as field experience and student teaching experience. We also have 16 STEM industry/association partners who have collaborated with RSC and continue to support this initiative. Our first STEM professionals will be certified this spring and be ready to teach in math or science in Arizona high-need districts in fall 2013.

87
Title: STEM for Humanity: The Impact of STEM Professionals on Everyday Life
NSF Noyce Award Number: 1136381
Principal Investigator: Evelyn Laffey
Email: ehlaffey@rci.rutgers.edu
Institution: Rutgers School of Engineering
Co-PI(s): Keith Weber, Thomas Papathomas, Mohan Kalekar, and Eugenia Etkina
Presenter(s): Raheem Balogun, Rutgers, rbalogun@eden.rutgers.edu
Michael Boan, Rutgers, mikeboan@gmail.com
Joshua Smith, Rutgers, smithjosh@gmail.com
Natalie Wright, Rutgers, nannabelle.wright@gmail.com
Caleb Williams, Rutgers, cgawilliams@gmail.com

The goals of the STEM for Education Scholarship Program (STEM-ESP) at Rutgers University are to recruit, retain, and graduate a community of engineers and physicists who are dedicated to teaching physics, mathematics and engineering in high-needs, K-12 school districts. With an overarching theme of “STEM for Humanity”, the project enhances Rutgers existing programs by blending the physics and engineering undergraduate programs with the existing graduate teacher preparation programs, strengthening the focus on teaching physics and mathematics to students in high-needs districts and infusing these programs with seminars that illustrate the great impact STEM has on society. This poster focuses on the STEM for Humanity seminar series, which aims to introduce scholars to the activities by students, staff and faculty in the STEM areas that have a component to benefit humanity through volunteerism for outreach and beyond-the-classroom activities (education, sustainability, health care, environment, economic development, etc.). During the 2012-2013 academic year, the first cohort of STEM-ESP Scholars engaged in the STEM for Humanity workshop series. They attended 6 seminars throughout the academic year. Each seminar focused on a various topics illustrating the impact of the work of STEM professionals on society. Each topic was complemented with a hands-on workshop.

The topics included: (1) The Sustainability of Cup Design; (2) The Impact of Oil Spills; (3) Air Quality; (4) Biomechanics and Prosthetics; (5) Packaging Engineering and Our Environment; and (6) The Role of Biomedical Sciences in Diabetic Wound Healing. The poster will present each topic and provide an opportunity for the audience to engage in the accompanying hands-on projects.

88
Title: Project Learn: SDSU Noyce Mathematics and Science Master-Teaching Fellowship Program
NSF Noyce Award Number: 1240127
Principal Investigator: Lisa Lamb
Email: Lisa.Lamb@sdzu.edu
Institution: San Diego State University (SDSU)
Co-PI(s): Donna Ross, San Diego State University, dross@mail.sdsu.edu
Randolph Philipp, SDSU, rphilipp@mail.sdsu.edu
Kathy Williams, SDSU, kwilliams@mail.sdsu.edu
Susan Nickerson, SDSU, snickerson@mail.sdsu.edu
Presenter(s): Lisa Lamb, SDSU, Lisa.Lamb@sdzu.edu
Meredith Houle Vaughn, SDSU, mhoulle@mail.sdsu.edu
URL(s): http://www.sci.sdsu.edu/CRMSE/noyce/

Teachers learn from teaching, but the extent of growth solely from teaching is, for most teachers, subject to ceiling effects. Professional development is not a pedagogical luxury that enables teachers to teach in better style; instead, well-designed, content-related, student-focused, sustained professional development provides entirely new and effective pedagogical possibilities (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Heller, Daehler, Wong, Shinozakura, & Miratrix, 2011; Levine, 2006; Wilson & Berne, 1999). We will support and investigate the work of 32 Mathematics and Science Master Teaching Fellows on their journeys to becoming more accomplished teachers and teacher leaders. The program involves partnerships of the San Diego State University (SDSU) College of Sciences, the SDSU College of Education, the nonprofit organization San Diego Science Alliance, and three high-need school districts with which SDSU has for years successfully partnered.

This project also involves a public-private venture—Qualcomm, Inc. has committed funds to support 10 of the 32 Master Teaching Fellows’ $10,000 stipends for each of the five years of the project, providing a corporate-sponsored grant of $500,000. This project represents a focused and concerted effort to identify effective mathematics and science teachers and provide them with professional development experiences designed to further empower them to improve their practices, serve as mentors for student teachers and novice teachers, and become leaders at their school sites and districts. By selecting effective mathematics and science teachers in the San Diego region, we increase the likelihood that these Master Teaching Fellows will emerge into expert teachers, mentors, and teacher leaders. The program supports the development of Master Teaching Fellows through three research-based phases: (a) the improvement of the Fellows’ classroom practices, (b) the development of the Fellows’ leadership skills, and (c) the opportunity for the Fellows to continue to grow while they serve as mentors and teacher leaders.
89
Title: The San Francisco State Robert Noyce Teacher Scholarship Program
NSF Noyce Award Number: 1136335
Principal Investigator: Larry Horvath
Email: lhorvath@sfsu.edu
Institution: San Francisco State University
Co-PI(s): Eric Hsu, San Francisco State University, erichsu@sfsu.edu
Adrienne Cool, San Francisco State University. cool@sfsu.edu
Presenter(s): Larry Horvath, San Francisco State University, lhorvath@sfsu.edu
URL(s): www.csmesf.org

In September 2012, twelve future STEM teachers were inducted as the first full cohort of San Francisco State University Robert Noyce Teacher Fellows (SFSU Noyce Fellows). Including both undergraduate and credential year students, the SFSU Noyce fellows are fully engaged as members of the much larger CSME Teacher Fellows program run through the SFSU Center for Math and Science Education (formerly the MSTI program). As future STEM teacher leaders and teacher researchers, SFSU Noyce Fellows attend twice-monthly Noyce seminars; serve in special internships focused on inquiry into the teaching and learning of math and science; develop and implement inquiry-based lessons as professional development for peers; carry out action research in their student teaching/internship placement; and work as content mentors with Community College students to support a more diverse STEM teaching pipeline. All SFSU Noyce Fellows are committed to teaching in high-needs schools and empowering students who have been most often underserved by our educational system.

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Title: Three Innovative Noyce Program Components
NSF Noyce Award Number: 1136322
Principal Investigator: Jim Matthews
Email: matthews@siena.edu
Institution: Siena College
Co-PI(s): Mark Jury, Michele McColgan, Larry Medsker, Lucas Tucker
Presenter(s): Jim Matthews, Siena College, Matthewm@siena.edu
Emily Casey, Siena College, ee05case@siena.edu
URL(s): www.siena.edu

The Noyce Mathematics and Science Teaching Scholarship Program at Siena College is completing its second year. Thus far, Noyce has impacted our preparation of mathematics and science teachers in several notable ways: 1.) Our Noyce Scholars have participated in an innovative field experience, the goal and result of which was a highly successful school mathematics symposium; 2.) We are significantly increasing the number of our mathematics graduates who will be qualified to teach computer science; and 3.) We are significantly increasing the percentage of our mathematics graduates who plan to teach in a high-needs school district. One way we are preparing our Noyce Scholars for success in high-needs schools is by involving them in an innovative school mathematics project. The project goal was to have each middle school student work on a challenging mathematics problem over a two-month period and then produce a conference poster and presentation on that problem. The project culminated in a school mathematics symposium modeled after professional mathematics conferences, and included a keynote speaker, poster presentations, and contributed paper sessions. At our institution we have a long history of success producing secondary mathematics teachers. Our Noyce project is requiring our mathematics scholars to complete a strong minor in computer science so they are qualified to teach computer science at the Advanced Placement level.

In the 12 years prior to receiving our grant, we only had 4 out of 65 students take these computer science courses despite being strongly advised to consider doing so. Because of Noyce, we have six students from our first cohort and four from our second cohort taking the courses. Thus, in each of the first two years we have outperformed the previous dozen years in this area. This success coincides with the “CS 10K Project” (supported by NSF) which has a goal of producing 10,000 computer science teachers for the pre-college level by 2016. Over the past 30 years, less than 10% of our approximately 200 graduates entering the mathematics teaching profession chose to work in a high-needs school. Our first eight pre-Noyce students (six in mathematics and two in physics) stayed on campus after the spring 2012 semester ended. They participated in an intensive five-week program which included course work, an 80 hour field experience at Schenectady High School, and a weekly seminar which exposed them to the challenges and rewards of working in high-needs schools. Post-experience survey results indicate that all of the participants would like their first teaching position to be in Schenectady High School or a school like it. Our success with this programming bodes well for increasing the number of Siena graduates pursuing teaching careers in high-needs schools and for increasing their ability to be successful in these schools.

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Title: California State University, Sonoma’s Noyce Scholar Program
NSF Noyce Award Number: 0934503
Principal Investigator: Carlos Ayala
Email: carlos.ayala@sonoma.edu
Institution: Sonoma State University
Co-PI(s): Lynn Stauffer, Ben Ford, and Scott Serverson
Presenter(s): Kirsten Searby, Coordinator, Sonoma State University, searby@sonoma.edu
URL(s): www.cs.nsf.org

The Sonoma State University’s Noyce Scholar Program started with five scholars in 2009 and has now served a total of 41 schol-
ars in mathematics and science. With 24 scholars in the teaching field, 14 current student teachers, and five undergraduates completing their degrees, the program has continued to evolve. It is a collaborative program comprised of the Science, Technology, and Engineering Department, the Mathematics Department, the Astronomy and Physics Department, and School of Education. The program recruits juniors and seniors as well as fifth year college students. Some juniors and seniors are learning assistants for professors in mathematics and science, a way for students to experience teaching. A few other undergraduate Scholars tutor struggling students in high-needs schools as an introduction to learn about students with special needs.

The Noyce Scholar Program has developed a learning community that meets monthly and where Scholars share their progress in the teaching process and/or their teaching experiences. They advise each other. They have become very active in furthering their education: four have attended the Robert Noyce Teacher Scholarship Program Conference in Washington DC; three have interned at either SLAC National Accelerator Laboratory, Pacific Northwest National Laboratory, or at NASA in Palmdale, CA. Nine of them presented technology use in classrooms for the education community at the SSU Teacher Technology Showcase. In the field, one has developed a school’s physics program; another wrote a grant to buy I-pads for her students; one is the lead teacher for a newly-developed Engineering Pathway; and one is participating in the Accelerating Academic Achievement for English Learners Project.

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**Title: Southern Illinois Community of Problem Solving Project: Impacts on Teachers’ Content Knowledge, Research and Pedagogical Skills**

**NSF Noyce Award Number:** 1136414

**Principal Investigator:** Karen Renzaglia

**Email:** renzaglia@plant.siu.edu

**Institution:** Southern Illinois University

**Co-PI(s):** Harvey Henson, henson@cos.siu.edu

**Frackson Mumba, frackson@siu.edu**

**Linggou Bu, lingguobu@gmail.com**

**Mary Wright, Southern Illinois University, mwright1@siu.edu**

**Presenter(s):** Harvey Henson, Southern Illinois University, henson@cos.siu.edu

The College of Science and College of Education and Human Services at Southern Illinois University Carbondale (SIUC), in partnership with Shawnee Community College (SCC) and high-need school districts in the region are mentoring and preparing 20 Master Teaching Fellows (MTFs) to transform science and math teaching in the region. MTFs are mentored by SIUC and SCC STEM faculty and educators to strengthen inquiry-based science experiences for teachers and students. As the principal agents for educational reform, MTFs are acquiring a deep grounding in science and mathematics content, inquiry-based learning methods, instructional interventions, and Action Research. Through courses, leadership activities, research experiences and involvement with training pre- and in-service science teachers, MTFs are establishing a community of problem solvers.

The Noyce MTF Program in Southern Illinois is focused on teachers leading Problem-Based Learning (PBL) and cultivating a community of problem solvers in mathematics and science. During the first year of program, ten MTFs completed two graduate courses on the Cache River Wetland (CRW) ecosystem and on scientific research methods for teachers. In addition to this professional development, MTFs developed research proposals for their Summer Research Experience for Teachers (SRET) in the CRW. During summer 2012, the first cohort of MTFs revised and extended their proposals and further engaged in a two-week SRET, supported by graduate students and faculty from SIUC and SCC. Experts in biology, geology, mathematics, and mathematics and science education provided multidisciplinary support in science content, methodology, mathematics, and research tools.

The outcomes of our MTFs’ research are captured in their research presentations, which include Beavers in the Cache River Wetlands, Bird Community Change and Habitat Succession, Benthic Macroinvertebrates in the CRW, Swamp Rabbits Occupancy in Upper and Lower CRW, Diatoms in the Cache, Ecotourism in the CRW, Rock Weirs and Habitat Heterogeneity and Carbon Levels and Ages of Restoration. The first cohort of MTFs presented posters showcasing their projects at the Carbondale Science Center and began incorporating science and math content and learning elements from their research into their classroom curriculum. MTFs are currently using Action Research to help evaluate this effort. The project is now in year two and recently added ten additional MTFs who are enrolled in graduate courses and preparing for the next SRET in the CRW.

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**Title: St. Edward’s University Robert Noyce Teacher Scholarship Program: Year Five Activities**

**NSF Noyce Award Number:** 0833123

**Principal Investigator:** Steven Fletcher

**Email:** stevenf@stedwards.edu

**Institution:** St. Edward’s University

**Co-PI(s):** Cindy Naples, St. Edward’s University, cynthia@stedwards.edu

**Bill Quinn, St. Edward’s University, billq@stedwards.edu**

**Presenter(s):** Steven Fletcher, St. Edward’s University, stevenf@stedwards.edu

**URL(s):** http://think.stedwards.edu/noyce/

St. Edward’s University Robert Noyce Teacher Scholarship Program Year Five activities include emphasis on induction and mentor/mentee relationship building as well as on professional development opportunities. Scholars participated in monthly STEM teacher circle meetings, professional conferences, and a
summer professional development institute designed to ease the transition to the classroom.

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Title: STEM Teacher Recruitment and Training using STEM Days, NASA, and Communities of Practice
NSF Noyce Award Number: 1136416
Principal Investigator: Lesa Beverly
Email: beverlyll@sfasu.edu
Institution: Stephen F. Austin State University
Co-PI(s): Keith Hubbard, Stephen F. Austin State University, hubbardke@sfasu.edu
Karen Embry-Jenlink, Stephen F. Austin State University, kjenlink@sfasu.edu
Presenter(s): Lesa Beverly, Stephen F. Austin State University, beverlyll@sfasu.edu
Keith Hubbard, Stephen F. Austin State University, hubbardke@sfasu.edu
Karen Embry-Jenlink, Stephen F. Austin State University, kjenlink@sfasu.edu

Talented Teachers in Training for Texas (T4) has developed several gateway activities for undergraduates considering a career in STEM Teachings: a STEM Day, a week-long Job Shadow, and a NASA Teaching Experience at NASA’s Clear Lake facility. We summarize these activities. We also present our approach to the building of an academic community with scholars through bi-weekly meetings where we discuss aspects of teaching, examine content and explore challenges for new teachers, as well as meet with practitioners (sometimes novice teachers) from the field. Regular classroom observation and reflection is an integral part of the program, as are local, regional, and national conferences.

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Title: Texas Leadership Initiative: Mathematics Instruction Transformed (Texas LIMIT)
NSF Noyce Award Number: 0934878
Principal Investigator: Kimberly Childs
Email: kchilds@sfasu.edu
Institution: Stephen F. Austin State University
Co-PI(s): Debbie Pace, SFA, dpace@sfasu.edu
Lesa Beverly, SFA, beverlyll@sfasu.edu
Betty Alford, SFA, balford@sfasu.edu
Presenter(s): Kimberly Childs, SFA, kchilds@sfasu.edu
Lesa Beverly, SFA, beverlyll@sfasu.edu
Debbie Pace, SFA, dpace@sfasu.edu
URL(s): http://www.sfasu.edu

The Texas Leadership Initiative: Mathematics Instruction Transformed (Texas LIMIT) project is focused on building a cadre of teacher leaders for high needs school districts in East Texas. Each Master Teaching Fellow is learning to design and deliver professional development in mathematics. These professional development modules will be evaluated by external reviewers and will be made available to other Texas LIMIT Fellows.

96
Title: Stonehill College “Communities of Practice: Teacher Preparation and Beyond”
NSF Noyce Award Number: 1240046
Principal Investigator: Karen L. Anderson
Email: karenanderson@stonehill.edu
Institution: Stonehill College
Co-PI(s): Kathleen McNamara, Stonehill College, KMcNamara@Stonehill.edu
Eugene Quinn, Stonehill College, EQuinn1@Stonehill.edu
Bonnie Troupe, Stonehill College, BTroupe@Stonehill.edu
URL(s): http://www.stonehill.edu/x28053.xml

A collective approach to the Robert Noyce Teacher Scholarship Program Project at Stonehill College, entitled Communities of Practice: Teacher Preparation and Beyond, helped to fulfill key objectives during our planning year (2012/2013). A reoccurring theme in both our project title and our year’s efforts is that of community and the fact that it takes a community to create a “community of practice”. As this was our planning year, our efforts were focused on recruitment of both future students (members of the class of 2017) as well as the recruitment of current mathematics majors not currently seeking educational licensure. Our poster will (1) define project parameters including our definition of communities of practice, (2) present a timeline of activities which indicates the individuals and offices on campus involved in project activities, (3) display copies of all available program materials (e.g., brochures, media releases, screen shots of our website, and applications for the Noyce Teacher Scholarships, the Noyce Undergraduate Research Experience at Stonehill College, as well as Noyce sponsored school-based enrichment programs), (4) show photos from our spring recruitment event (Pi Day), and (5) share evaluation materials from exit surveys as well as baseline data from the Stonehill graduating class of 2013.

97
Title: Stony Brook University Noyce 2
NSF Noyce Award Number: 1035314
Principal Investigator: Keith Sheppard
Email: keith.sheppard@stonybrook.edu
Institution: Stony Brook University
Co-PI(s): Angela Kelly, Stony Brook University, an-
The Robert Noyce Scholars Program at Stony Brook University is directed through the Center for Science and Mathematics Education (CESAME), which recruits, selects, educates and mentors highly qualified science and mathematics majors to teach in high needs schools in the region. The Noyce scholars are educated in content and a process rich curriculum. They utilize age appropriate practical activities to enhance student learning. Additionally newly appointed Noyce master teachers, who are working in high needs schools are involved directly in our science education methods courses. This represents a new phase in the mentoring development of a cadre of professional, highly qualified science and mathematics teachers committed to educating students in high needs schools.

98
Title: SUNY Cortland Noyce Project
NSF Noyce Award Number: 0934777
Principal Investigator: Greg Phelan
Email: gregory.phelan@cortland.edu
Institution: SUNY Cortland
Co-PI(s): Mary Gfeller, SUNY Cortland, mary.gfeller@cortland.edu
Dr. Rena Janke, SUNY Cortland, rena.janke@cortland.edu; Dr. Larry Klotz, SUNY Cortland, larry.klotz@cortland.edu
Presenter(s): Gregory Phelan, SUNY Cortland, gregory.phelan@cortland.edu
URL(s): www.cortland.edu/noyce

The SUNY Cortland Noyce Project proposes to award 50 scholarships to highly qualified science and math majors, or career changers, seeking to become K-12 teachers. Forty-five scholarships (12 graduate and 30 undergraduate) have been awarded to 34 Noyce Scholars. The average GPA of undergraduate Noyce Scholars at time of application is 3.6. Eighty-four qualified applications were received by the end of the Project’s third year ending May 31, 2012. Primary recruitment methods include campus and community outreach. Campus outreach includes Noyce-sponsored and led workshops and lectures, SUNY Cortland website articles and Scholar spotlights, campus and alumnae newsletters, posters, information sessions, and faculty education. Community outreach includes press releases, science fair participation, public service announcements, and rack card distribution at career centers and the local business showcase. Our Annual Noyce Scholar Workshop continues both to build a solid Noyce community, within the campus and within the Central New York region, and to strengthen the skill set of Noyce Scholars by addressing issues related to successfully teaching in a high-need environment. Nearly 100 Noyce Scholars, SUNY Cortland students, and faculty participated in a two-hour State of Poverty Simulation held in the spring of 2013. The goal of the simulation was to help participants understand some of poverty’s complexities and the obstacles people living in poverty may face and to reflect on the impact this has on the students facing this reality. The event was immediately followed by afternoon breakout sessions, led by 10 local math and science teachers, gave our Scholars insight into co-teaching, the importance of in-house networking, and sustaining yourself when the going gets rough. We also continue to support our Scholars to build math and science content knowledge beyond their traditional coursework by encouraging/sponsoring application to and participation in professional societies and conferences, on-campus research, and summer research programs such as CAL State’s STAR Teacher Researcher program.

99
Title: Syracuse University Noyce Scholars Program for Science and Mathematics Teachers
NSF Noyce Award Number: 0934841
Principal Investigator: John Tillotson
Email: jwtillot@syr.edu
Institution: Syracuse University
Co-PI(s): Joanna Masingila, Syracuse University, jomasing@syr.edu
Sharon Dotger, Syracuse University, sdotger@syr.edu
Jason R. Wiles, Syracuse University, jwiles01@syr.edu
Eileen Strempel, Syracuse University, strempel@syr.edu
Presenter(s): Jason R. Wiles, Syracuse University, jwiles01@syr.edu
URL(s): www.cortland.edu/noyce

The Syracuse University Noyce Scholars Program for Science and Mathematics Teachers (SU-Noyce) is a multi-faceted project involving Syracuse University and the Upstate Louis Stokes Alliance for Minority Participation (LSAMP) consortium, partnering with area high-needs school districts and a network of informal STEM education centers from across central New York with the goal of increasing the number of highly-qualified science and mathematics teachers teaching in our nation’s neediest schools.

The specific goals of the project include: 1) Offering substantial scholarships to prepare 36 additional highly-qualified secondary mathematics and science teachers (years 2-5 of the project), a full 41% increase over the current capacity; 2) Creating a multimedia recruitment and advertising campaign to attract a diverse and academically gifted pool of applicants for the SU-Noyce Scholars Program (years 1-5); 3) Offering 24 paid summer internships (6 per year during years 2-5 of the project) for talented STEM undergraduates to participate in service learning programs working with students from high-needs schools; 4) Facilitating the supported transfer of diverse STEM majors from our community college partners into SU’s teacher education programs; 5) Providing a robust and sustained mentoring and professional development program for the SU-Noyce Scholars during their first three years of teaching in a high-needs school; and 6) Conducting a rigorous external project evaluation to measure the
overall effectiveness of the SU-Noyce Scholars program on an annual basis.

Our poster session will report on the various types of professional development programming that we have utilized with our cohorts of Noyce Scholars, focused on strategies for success in teaching science and mathematics in high-needs urban and rural schools. Information regarding our evaluation model for examining how Noyce Scholars’ ideas about effective teaching and learning evolve will also be shared.

100 Title: Tennessee Technological University-STEM Majors for Rural Teaching (TTU-SMaRT)
NSF Noyce Award Number: 1136403
Principal Investigator: Stephen Robinson
Email: sjrobinson@tntech.edu
Institution: Tennessee Technological University
Co-PI(s): Holly Anthony, TTU, hanthony@tntech.edu
Presenter(s): Stephen Robinson, TTU, sjrobinson@tntech.edu
URL(s): www.tntech.edu/noyce

The TTU-SMaRT Noyce Scholarship program is in its second year. We aim to recruit STEM majors to complete their degrees and also obtain a license to teach Math, Chemistry, and Physics. The four strategies we employ are paid early teaching experiences, academic year scholarships, paid summer internships for Noyce scholars, and induction-year support for newly placed teachers. The early teaching experiences and internships are structured in collaboration with the Millard Oakley STEM Center at TTU and give participants opportunities to work with K-12 students in the outreach programs of the Center, and also to interact with practicing teachers during professional development workshops. During the last year, seven different students took advantage of the early teaching experience. In addition, two students were supported with academic year Noyce scholarships, one as an undergraduate and the other as a post-bac. These will both complete their internships this summer and then graduate from the program at the end of the fall semester, one with licensure in Chemistry, the other in Math. We are currently recruiting for this summer and the next academic year.

101 Title: TAMU aggieTEACH Robert Noyce Scholarship Program
NSF Noyce Award Number: 0934887
Principal Investigator: Timothy P. Scott
Email: tim@science.tamu.edu
Institution: Texas A&M University
Co-PI(s): Carolyn M. Schroeder, Texas A&M University, cschroeder@tamu.edu
Presenter(s): Timothy P. Scott, Texas A&M University, tim@science.tamu.edu
Nolan Dement, Texas A&M University, ndement13@neo.tamu.edu

The goal of the TAMU aggieTEACH Program is to provide scholarships to approximately junior/senior level undergraduate students majoring in STEM and pursuing teaching careers in grades 8-12. To date, 25 students have been selected as aggieTEACH Noyce Scholars. For the fourth year, 10 scholarships have been awarded—6 Scholars are female and 4 are male; 8 are mathematics majors and 2 are science majors. Texas A&M University continues to lead the state in the production of university prepared science and mathematics teachers. The aggieTEACH Noyce Scholarship Program offers financial support to these students as they complete their teacher preparation program as well as programmatic activities focused on preparing exceptional science and mathematics teachers. Our poster presentation will describe the components of the aggieTEACH Program and the aggieTEACH Noyce Scholarship Program. We will demonstrate that our aggieTEACH Noyce Scholars rank high among their peers and that our recruitment efforts in maintaining a high level of STEM majors pursuing teaching have been successful. We will present all program activities that the Scholars have participated in and will spotlight collaboration among districts and other funded programs of the Center of Mathematics and Science Education linked to the aggieTEACH Noyce Scholarship Program. We will highlight seminars and activities of the TAMU STEM Teacher Preparation Academy and involvement of Scholars. Lastly, we will showcase aggieTEACH Noyce Scholars currently in the classroom and their progress.

102 Title: A Study of Self-determination Among Texas Tech Noyce Scholars
NSF Noyce Award Number: 0833326
Principal Investigator: Jerry Dwyer
Email: jerry.dwyer@ttu.edu
Institution: Texas Tech University
Co-PI(s): Dominick Casadonte, Texas Tech University, dominick.casadonte@ttu.edu
Jeff Lee, Texas Tech University, jeff.lee@ttu.edu
Lawrence Schovanec, Texas Tech University, lawrence.schovanec@ttu.edu
Tara Stevens, Texas Tech University, tara.stevens@ttu.edu
Presenter(s): Jerry Dwyer, Texas Tech University, jerry.dwyer@ttu.edu
URL(s): www.depts.ttu.edu/stem/noyce.php

Over the life of the Texas Tech Noyce Scholars (TTNS) program, 40 students have participated. The majority are math majors (60%) with 20% from Chemistry and the remainder from multidisciplinary science, including physics. Some of the 40 students began with pre-Noyce programs while another 25 students participated in pre-Noyce programs but didn’t progress to a teaching degree. Participants utilize a support structure including weekly seminars and peer-to-peer mentoring. The theoretical framework posits that teachers who possess competence to be effective, a sense of autonomy to act on their environments, and...
relatedness to benefit from supports available will be more likely to respond effectively to difficulties and to feel successful in their efforts. When teachers experience competence, autonomy, and relatedness, they are self-determined. Research supports that self-determined teachers experience lower levels of burn-out and higher levels of continued use of new technology, and self-reported work performance. The focus of the support structure is to develop self-determined teachers, and findings from TTNS evaluations have supported these relations. TTNS scholars’ report that project participation for autonomous reasons was significantly and positively associated with scholars’ perceptions of the teaching profession ($r = .71, p = .01$). Additionally, scholars report significantly lower levels of external motivation for participation in TTNS activities than students who received only summer stipends to work on STEM outreach projects. TTNS scholars reported significantly lower levels of controlling motivation than summer stipend recipients. TTNS scholars’ report that project participation for external reasons was significantly and positively associated with their perceptions of the teaching profession ($r = .50, p = .05$), which was not expected. Although, this result indicates that individuals can be motivated by both internal and external factors, the correlation is not as strong as that found between autonomy and positive perceptions of the teaching profession. Thus, the scholars’ views of teaching seem to be more strongly related to their self-determination. A focus of the project is to support participants’ natural or intrinsic tendencies to behave in effective and healthy ways. Although sample sizes have limited a thorough investigation of self-determination growth associated with project participation, evidence is accumulating to support scholars’ success.

103

Title: The Towson University Robert Noyce Teacher Scholarship Program: Looking Ahead and Lessons Learned

NSF Noyce Award Number: 0934751
Principal Investigator: David A. Vanko
Email: dvanko@towson.edu
Institution: Towson University

Co-PI(s): Jeff Passe, Todd Kenreich, Donald A. Thomas, and Jane L. Wolfson
Presenter(s): David A. Vanko and Natasha Walker
URL(s): http://www.towson.edu/FCSM/Noyce/

Towson University’s (TU) Noyce program awards scholarships to juniors and seniors, and stipends to Master of Arts in Teaching students, who are seeking certification to teach in the STEM disciplines. The program features recruitment, monthly activities, and a monitoring/evaluation program. It reflects a longstanding collaboration of Towson University’s Fisher College of Science and Mathematics and the College of Education. Towson’s Noyce program was intentionally designed to attract high caliber students whose financial needs might otherwise prohibit their entry into teacher preparation. This is being accomplished through coordination with our NSF STEP grant involving TU, Baltimore City Community College and the Baltimore City Public School System, our two NSF S-STEM grants, and several other existing programs that provide opportunities to identify and mentor a diverse pool of teacher preparation candidates. In this fourth year of the program, we awarded 6 new scholarships and 3 new graduate stipends. To date, 38 students have been supported through the program. Effort continues to be placed on creating opportunities for the Noyce scholars to carry out hands-on activities with children during various outreach activities. For example, Noyce scholars volunteer to create and implement hands-on science activities for our Saturday Morning Science series. Other Noyce scholars volunteer as local science fair judges, or they work with students during classroom visits to the university arranged by their teachers or Towson faculty. Feedback from the scholars indicates that these activities are highly valued. Our program holds an Annual Fall Banquet welcoming new scholars, monthly meetings, scheduled and ad hoc peer mentoring/tutoring, and other social events for community development. The program maintains communication with 18 scholars who have graduated, including the 17 who are teaching (6 in biology, 5 in math, 3 in physics, and 3 in earth-space science). Seven more students are expected to graduate in May 2013. Graduates who are teaching report that one of their biggest challenges is classroom management, which has led to rich discussions about this topic at the monthly meetings. This is one example of the benefit of maintaining contact with graduates—something that can benefit both the graduates and the teachers in training.

104

Title: The Noyce Summer Internship for Recruiting Potential STEM Teachers

NSF Noyce Award Number: 0934835
Principal Investigator: Shari Albright
Email: shari.albright@trinity.edu
Institution: Trinity University

Co-PI(s): Jeff Nordine, Trinity University, jnordine@trinity.edu
Presenter(s): Shari Albright, Trinity University, shari.albright@trinity.edu / Jeff Nordine, Trinity University, jnordine@trinity.edu / Amber Sanchez, Trinity University, asanchez2@trinity.edu
URL(s): http://www.trinity.edu/noyce

At Trinity University, we have created a program called the Noyce Summer Internship, which provides rising sophomore and junior STEM majors with an opportunity to conduct research with a STEM faculty member and explore teaching by participating in Trinity’s Upward Bound program as a near-peer tutor and mentor. Upward Bound is an academic enrichment and support program for aspiring first-generation and low-income college students. By coupling summer research with a teaching experience, the Noyce Summer Internship gives STEM students a relatively low-risk opportunity to explore a nascent interest in teaching while gaining valuable experience in a research setting. This
hybrid research and teaching program has been very successful in attracting top STEM students, and most Interns have opted to continue taking education courses after the conclusion of their summer experience. We will report from three years of program implementation (2010, 2011 and 2012), including findings and results from focus group interviews and survey data with the STEM majors.

105
Title: Supporting Noyce Scholars and Fellows with Professional Development School Partnerships
NSF Noyce Award Number: 0934836
Principal Investigator: Todd Quinto
Email: todd.quinto@tufts.edu
Institution: Tufts University
Presenter(s): Ryan Redmond, Tufts University, ryan.redmond@tufts.edu
Linda Beardsley, Tufts University, linda.beardsley@tufts.edu

The Tufts University Robert Noyce Teacher Scholarship Program is a collaboration between the Education, Physics, and Mathematics departments, the Center for Applied Special Technology, and six Boston-area urban and urban rim public schools. This program focuses on recruiting students with bachelor degrees in mathematics and the sciences and supports them to become effective mathematics or science teachers who are committed to teaching in high-needs middle and secondary schools by providing mentorship (by four Master Teaching Fellows [MTF]) over their first four years of teaching after graduation. The scholarship recipients comprise two cohorts of eight Teaching Fellows (TF) each pursuing the Tufts MAT degree for middle or high school mathematics or physics. The first cohort of eight students finished up their teacher preparation program in the summer of 2012. Five of them received initial teacher licenses in high school mathematics, one of them in middle school mathematics, and two of them in high school physics. The second cohort of eight students is currently in the final months of its preparation program. In this cohort, there are three in high school mathematics, three in high school physics, and two in middle school mathematics. We have designed a comprehensive research and evaluation plan that is tracking the impact of the program on the professional development of the Teaching Fellows over the duration of the project. Our project research and evaluation is centered around the following primary goals: effectiveness of TF teacher preparation; effectiveness of MTF mentoring of TFs; understanding of teaching in urban settings; transforming teachers’ practices in mathematics and science; developing and strengthening new courses in math and physics for teachers; increasing the numbers of teachers of mathematics and science in urban settings; attracting a more diverse and stronger pool of candidates to Tufts University for the teaching of mathematics and science; and tracking the development of stronger relationships with local urban schools.

106
Title: Tufts University Robert Noyce Teacher Scholarship Program: The Urban Mathematics and Science Teacher Collaborative
NSF Noyce Award Number: 1035342
Principal Investigator: Walter Hill
Email: hillwa@tuskegee.edu
Institution: Tuskegee University
Presenter(s): Carlton E. Morris, Tuskegee University, cmorris@mytu.tuskegee.edu
Mohammed Qazi, Tuskegee University, maqazi@mytu.tuskegee.edu

This Noyce scholarship program is a partnership of Tuskegee University and seven high-needs school districts in the Alabama Black Belt that has been formed to address shortages of science and mathematics teachers in these districts. The program responds to these shortages by encouraging juniors and seniors...
(Noyce Scholars) majoring in the fields of Animal Science, Biology and Mathematics at Tuskegee to concurrently pursue a second degree in general science education or in mathematics education. Once all the requirements for teacher certification are complete, for which a fifth year of study is needed, the graduates of the Tuskegee Noyce program assume teaching positions in one of the partnering schools. Equipped with a contemporary mathematics and science teacher education foundation and a solid formation in the STEM content areas, the Noyce program graduates are poised to make a positive impact in augmenting the quality and quantity of highly qualified teachers of science and mathematics in the Alabama Black Belt. We anticipate recruiting a total of eighteen Noyce Scholars at Tuskegee during this five-year project. In the four years since the project has been instituted, ten STEM majors have joined the Noyce program, two of which graduated in May 2011 and were subsequently placed in partner school districts. This poster describes key programmatic aspects of the Noyce Scholarship program at Tuskegee University and its accomplishments to date.

108
Title: BioTeach: Innovative Professional Development for In-service and Pre-service Middle and High School Teachers
NSF Noyce Award Number: 1136327
Principal Investigator: J. Michael Wyss
Email: jmwys@uab.edu
Institution: University of Alabama, Birmingham
Presenter(s): J. Michael Wyss, University of Alabama, Birmingham, jmwys@uab.edu
URL(s): www.uab.edu/cord

The ability of secondary STEM teachers to excite and educate their students is critical to enlarging the pipeline for college training and careers in STEM. For these reasons, ongoing education opportunities for STEM teachers are needed to keep them current in their discipline and innovative in their approach. BioTeach has been offered annually through University of Alabama Birmingham’s (UAB) Center for Community Outreach and Development since 1999 and provides teachers throughout Alabama and adjacent states with tools and training to implement college-level, inquiry-based biology labs in the classroom. Up until 2011, when UAB received Noyce funding, this program was limited to in-service teachers. Since 2011, we have been able to enroll CESAME (Noyce) scholarship recipients into the program, so that they can gain experience in inquiry-based science education before entering the classroom. In 2012 we expanded the program to advanced level STEM middle school teachers, thus providing better vertical alignment in the school districts in which our teachers work. Also in 2011, we extended BioTeach to teachers in high school who taught subjects other than biology. Five physical science and 2 environmental science teachers have taken BioTeach in the last 2 years. Finally, in this regard, we have given pre-scholarship students an opportunity to experience this education model by participating as facilitators in the summer programs and during the school year in the MS/HS classroom and in the GENEius Lab.

The three components of BioTeach are: 1) the BioTeach Summer Course, an intense three-week summer course that provides teachers first-hand knowledge of how to guide their students in state-of-the-art molecular biology and biotechnology experiments in the classroom. 2) the GENEius Lab to which teachers bring their students for hands-on, molecular biology based lab experiences in a state-of-the-art lab and 3) Molecular Biology Classroom Modules that include all supplies related to advance microbiology and biotechnology labs for use by the BioTeach teachers in the classroom. Since BioTeach’s Inception, 340 teachers have trained in the course. These teachers annually reach >35,000 students. The 10 pre-service teachers in the course have demonstrated similar competencies in molecular biology education at the conclusion of the course. Similarly, the non-biology teachers have shown great success in effectively modifying and implementing modules in their non-biology courses to teach as far ranging subjects as physics and chemistry. They report that the course provides excellent cross-disciplinary integration of science concepts. Similarly, most pre-scholarship students serving as facilitators continued their desire to be STEM teachers, but some have realized that they want to pursue other avenues.

109
Title: What Are They Doing? Teachers from University of Arkansas
NSF Noyce Award Number: 0733841
Principal Investigator: Gay Stewart
Email: gstewart@uark.edu
Institution: University of Arkansas
Presenter(s): Gay Stewart University of Arkansas, gstewart@uark.edu
URL(s): physinfo.uark.edu

Starting in January 2008, we began awarding scholarships to future teachers in the mathematics and sciences in our Robert Noyce Scholarship program. Originally, we proposed to support 36 teachers. Forty-nine students have completed their certification and many are still in the field, post-commitment. We are currently completing a Master Teacher program.

110
Title: Outcomes and Lessons Learned in a Five-Year Noyce Scholarship Program at the University of Arkansas
NSF Noyce Award Number: 1239804
Principal Investigator: John Stewart
Email: johns@uark.edu
Institution: University of Arkansas
Co-PI(s): Gay Stewart, University of Arkansas, gstewart@uark.edu
The University of Arkansas received a Noyce Scholarship grant in fall 2007. It has since received two supplements to the original funding. The original goal of this Uark-Noyce program was to produce 36 new STEM teachers by granting Noyce Scholarships. These scholarships would provide support for STEM graduates who wish to enter the University of Arkansas (UA) Master of Arts in Teaching (MAT) program. The Robert Noyce Scholarship Program for Mathematics, Science and Engineering K-12 Teachers at UA has been fully subscribed with all planned scholarships offered. The key to both funding and implementing the program has been a strong, well-planned, multi-faceted recruitment effort and building on capabilities and partnerships developed in other funded projects. This poster presents a sample of the professional outcomes of our Noyce scholars. We will summarize our experience with a variety of recruiting strategies and experiences working with school districts in the placement and mentoring of scholars. We will also discuss features that grew out of the administration of the program and features we wish we had built in at the beginning.

111
Title: Cal Teach Berkeley Undergraduate Commitment to STEM Teaching Strengthens Through Noyce Internships and Scholarships
NSF Noyce Award Number: 0934951
Principal Investigator: Deborah Nolan
Email: nolan@stat.berkeley.edu
Institution: University of California, Berkeley
Co-PI(s): George Johnson, University of California, Berkeley, gjohnson@me.berkeley.edu
Xiaoxia Newton, University of California, Berkeley, xnewton@berkeley.edu
Presenter(s): Atalie Chan, University of California, Berkeley, acchan@berkeley.edu
URL(s): http://calteach.berkeley.edu

Undergraduate students at UC Berkeley are encouraged to explore teaching as a career and make a commitment to K-12 math and science teaching through participation in Noyce internship and scholarship experiences offered by the Cal Teach program. Cal Teach Berkeley is an interdisciplinary teacher education program that allows undergraduate students to complete their degrees in math, science or engineering while simultaneously earning a single-subject teaching credential with a focus on teaching in urban schools. Cal Teach Berkeley coordinates paid internships to lower division students with local organizations and schools. In addition, the program awards scholarships to upper division students who commit to getting their teaching credential as they complete their disciplinary degree and to teaching math or science in a high-need school district when they graduate. We piloted an intensive classroom internship in local K-12 schools this past year during winter break, after a model initiated by UCLA’s Cal Teach program, and present outcomes for UC Berkeley student participation here. Furthermore, we have analyzed survey responses from Noyce interns across several years, as well as a series of interviews from current students and graduates who received Noyce scholarships. We present a cumulative evaluation of the program’s effectiveness in persuading students to commit to teaching as a career, and discuss the impact of the evaluation on our future plans for the program.

112
Title: Super Leaders, Super Teachers: Math For America Berkeley’s Teacher Leadership and Pedagogy Professional Development Program
NSF Noyce Award Number: 1136432
Principal Investigator: Deborah Nolan
Email: nolan@stat.berkeley.edu
Institution: University of California, Berkeley
Co-PI(s): George Johnson, University of California, Berkeley, gjohnson@me.berkeley.edu
Judith Warren Little, University of California, Berkeley, jwlittle@berkeley.edu
Presenter(s): Katherine Reid, University of California, Berkeley, kathycaylorreid@gmail.com
URL(s): http://www.mathforamerica.org/berkeley

The Math for America (MfA) Berkeley program supports outstanding middle and high school math and science teachers in local urban schools to become Master Teachers and leaders within their schools and districts. The Master Teacher Fellowship Program provides a structured five-year professional development sequence that is built on a conceptual framework of three key dimensions: teaching expertise and classroom accomplishment, mentoring expertise and contributions to colleagues, and leadership and school improvement capacity. Based on recent research, the MfA Berkeley program addresses these dimensions and works to meet the needs of each teacher as she/he moves through the program.

There are four main questions guiding our research and program evaluation: (1) How do the Master Teacher Fellows’ teaching perspectives and practices change as they move through the MfA Berkeley program? (2) What professional development experiences does each fellow engage in and how are these experiences judged? (3) To what extent do the fellows assume a leadership role in their schools or districts? (4) What are the effects of the MfA Berkeley program on student achievement? To answer these questions, we are collecting background information from each teacher fellow and baseline student achievement data for each teacher, as well as surveys, interviews, and field notes from each of the professional development experiences. We have made recent progress in answering the first three of these questions. We will discuss our findings, which include (1) how...
Title: Tipping the Balance to STEM Teaching

**Title:** Tipping the Balance to STEM Teaching  
**NSF Noyce Award Number:** 1035164  
**Principal Investigator:** Joseph Rudnick  
**Email:** jrudnick@physics.ucla.edu  
**Institution:** University of California, Los Angeles  
**Co-PI(s):** Arlene Russell, UCLA, russell@chem.ucla.edu  
**Jody Priselac, UCLA, priselac@gseis.ucla.edu**  
**Bruce Rothschild, UCLA, blm@math.ucla.edu**  
**Presenter(s):** Arlene A. Russell, UCLA, russell@chem.ucla.edu  
**Jody Priselac, UCLA, priselac@gseis.ucla.edu**  
**URL(s):** http://college.ucla.edu/cateach

Grounded on the “Planned Happenstance” theory* that chance and unexpected opportunities play a significant role in most peoples’ career decisions, Tipping the Balance provides a one-week, paid summer internship for STEM students interested in teaching. The synergistic confluence of a late September start for the UCLA quarter system and the social-justice focus of the UCLA Teacher Education Program provides ideal Noyce-type environments for internships for our STEM students who are considering teaching careers. In the first three years of our Noyce program, 150 students have participated in the internship with more than half have been entering community college transfer students. Additionally, Tipping the Balance has provided 37 seniors in our joint BS/credential/MEd programs in Science and Math with academic-year scholarships thus enabling them to focus on their graduate teacher preparation courses even as they complete their BS course work. Longitudinal data on the academic and career paths of our interns and scholars will be presented. * Mitchell, K.E., Levin, A., S., Krumbolz, J. D., Planned Happenstance: Constructing Unexpected Career Opportunities, Journal of Counseling and Development 77 1999, 115-122.

Title: Noyce Programs at UCSD

**Title:** Noyce Programs at UCSD  
**NSF Noyce Award Number:** 0934223  
**Principal Investigator:** Amanda Datnow  
**Email:** adatnow@ucsd.edu  
**Institution:** University of California, San Diego  
**Co-PI(s):** Jeff Remmel, University of California San Diego, jremmel@ucsd.edu  
**Chris Halter, University of California San Diego, chalter@ucsd.edu**

The Noyce-CalTeach programs developed at UC San Diego (UCSD) are unique among comparable programs. It is through our purposeful partnerships that the program succeeds. The focus of the program is to create and support a community of educators bringing together UCSD STEM majors, community college students, pre-service teacher candidates, and Master Teachers. The Noyce-CalTeach Teacher Scholarship program provides pre-service teachers with scholarships and mentoring opportunities as they work with K-12 students in extended early fieldwork. While serving as classroom content tutors and role models for adolescent learners, these pre-service teachers are mentored by veteran classroom teachers. The Noyce Master Teacher Fellowship provides veteran teachers with extended learning and professional development opportunities.

Through online courses and face-to-face interactions, our Master Teachers are able to further their own growth while supporting the growth of new teachers. Each Master Teacher has the opportunity to work with aspiring educators from the community college partners, undergraduate STEM majors, and pre-service teacher candidates. Courses and fieldwork experiences are used to blend deep content knowledge with strong pedagogical practices. It is only through ongoing collaboration and partnership that we can bring the strengths of multiple UCSD departments together to create a powerful learning experience for our future science and mathematics teachers. The program is supported by purposeful fieldwork with local school districts, high-needs local schools, and carefully selected mentor teachers who receive explicit training in mentoring new teachers. These new STEM students in early field experiences engage in discipline-specific pedagogy and intensive teaching apprenticeship experiences to prepare UCSD undergraduates to enter the graduate teacher credential program. The partnerships and field experiences are designed to give the students specific, supported, and scaffolded interactions with Master Teacher Fellows and adolescent learners.

Through the partnership between Education Studies Program and the Physical Sciences Division, the community colleges, and the Noyce Master Teacher Fellows program, the courses and experiences of future teachers has been planned and scaffolded to provide them with the tools to make informed and effective classroom decisions. With the local school partnerships, our STEM majors are able to learn about the work of effective urban teachers as well as provide important mentoring and tutoring to local K-12 students creating far-reaching impacts on our local community.
115
Title: A DNR-Based Approach to Developing Algebraic Reasoning from Quantitative Reasoning
NSF Noyce Award Number: 0934695
Principal Investigator: Guershon Harel
Email: harel@math.ucsb.edu
Institution: University of California, San Diego
Co-PI(s): Barbara Edwards, UC San Diego, bedwards@ucsd.edu
Presenter(s): Genevieve Esmende, Wagenheim Middle School, gesmende@sandi.net
Scott Frazier, San Diego High School-Science and Technology, scottfrazier1982@gmail.com
Brian Shay, Canyon Crest Academy, Brian.Shay@sduhd.net
Osvaldo Soto, Patrick Henry High School
URL(s): www.mathforamerica.org/sandiego

Our poster demonstrates how one teacher carefully crafted, and subsequently used, a sequence of rate problems to develop algebraic reasoning in her students. The sequence of problems and the associated teaching practices used were guided by an attempt to implement the DNR theoretical framework that Math for America San Diego (MfA SD) fellows explore in the professional development. We hope visitors will enjoy learning more about the problems, what guided their sequencing, the experiences of teachers exploring the DNR framework, and something practical to use in their own classroom. MfA SD is a non-profit organization which works with three local universities and five school districts in order to improve teaching and learning of mathematics in high-need high schools. With support from NSF Noyce and other funds, MfA SD provides professional and financial support for five years to a select group of recent undergraduates and career changers as they enter a credential program at one of our partnership universities (CSU San Marcos, San Diego State, UC San Diego). MfA SD also manages a Noyce Master Teaching Fellowship award received by UC San Diego.

116
Title: The New Robert Noyce Teacher Scholarship Program at the University of California Santa Barbara
NSF Noyce Award Number: 1240075
Principal Investigator: Julie Bianchini
Email: jbianchi@education.ucsb.edu
Institution: University of California Santa Barbara
Co-PI(s): Sandra Seale, DPEA Foundation, seale@dpeaf.org
Susannah Scott, UCSB, scott@engineering.ucsb.edu
Michael Gordon, UCSB, mgordon@engr.ucsb.edu
Deborah Fygenson, UCSB, deborah@physics.ucsb.edu
Presenter(s): Sandra Seale, DPEA Foundation, sandy@dpeaf.org

The University of California Santa Barbara (UCSB) has received a grant to establish a Robert Noyce Teacher Scholarship Phase I program, CalTeach: Physical Sciences and Engineering (CTPSE). Our team includes UCSB faculty from the College of Engineering and the Departments of Chemistry & Biochemistry, Physics, and Education; high school teachers and principals from two exceptional STEM Academies in the high-need Santa Barbara Unified School District; and program directors and community leaders from UCSB’s Mathematics, Engineering, and Science Achievement program, the Dos Pueblos Engineering Academy Foundation, and the Santa Barbara County PreK-20 STEM Council. CTPSE is targeting UCSB undergraduates majoring in chemistry, physics, and engineering with the goal of increasing the number, quality, and diversity of physics and chemistry teachers. We are preparing these teachers to implement the National Research Council’s Framework for K-12 Science Education in high-need secondary schools, specifically, to teach science and engineering core ideas and practices to underserved students.

CTPSE reflects current reform recommendations to integrate the teaching of engineering core ideas and practices with those of science and to actively engage students in exploring relevant questions and problems. There are strong conceptual connections across the recruitment and support of UCSB undergraduates pursuing a teaching career in physics and chemistry, the STEM Academies in the high-need Santa Barbara Unified, our highly regarded UCSB Teacher Education Program, and California’s successful Beginning Teacher Support and Assessment Induction programs. These connections will provide Noyce Scholars with a continuous, coherent pathway for growth in their knowledge of science content, student learning, and strategies that are effective in teaching all students. Both well-established and new collaborations among UCSB engineering, science, and education faculty will ensure that the challenges of preparing teachers to teach the physical sciences to California’s diverse students are identified and addressed from multiple points of view and intellectual traditions. Ultimately, CTPSE will improve the teaching of chemistry and physics to underserved students, providing more Latinos/as, low-income students, and English learners with access to an excellent and equitable physical science education.

117
Title: Performance-based Assessment for UCSB Noyce Teacher Candidates
NSF Noyce Award Number: 0934735
Principal Investigator: Jane Close Conoley
Email: jane-conoley@education.ucsb.edu
Institution: University of California Santa Barbara
Co-PI(s): Pierre Wiltzius, University of California, Santa Barbara
MPLS dean@Ltsc.ucsb.edu
Julie Bianchini, University of California, Santa Barbara, jbianchi@education.ucsb.edu
William Jacob, University of California, Santa Barbara, jacob@math.ucsb.edu
Petra Van Koppen, University of California, Santa Barbara, petra@chem.ucsb.edu
Cody Foster, University of California, Santa Barbara, codycfos-
For a number of years, the Teacher Education Program (TEP) at the University of California, Santa Barbara has used PACT, a California performance-based assessment for preservice teacher candidates. PACT has been helpful in determining if our teacher candidates are prepared to enter their own classrooms and to assess the effectiveness of TEP itself. This year we are field testing a national performance-based assessment, edTPA. Our poster will contain insights about edTPA that we have gleaned from our experience, including the insights of one of our Noyce Scholars.

118
Title: The University of Chicago Urban Teacher Education Program in Math or Biology: An Extended Residency-Induction Model
NSF Noyce Award Number: 0934845
Principal Investigator: Kavita Kapadia
Email: kkapadia@uchicago.edu
Institution: University of Chicago
Co-PI(s): Michael LaBarbera, University of Chicago, mlabarbe@uchicago.edu
Paul Sally, University of Chicago, sally@math.uchicago.edu
Presenter(s): Douglas O’Roark, University of Chicago, dougoroark@uchicago.edu

Students in the University of Chicago’s Urban Teacher Education Program in math or biology (UChicago UTEP) prepare for two full years at the University before earning a master’s degree and teaching certification. In the program’s second year these students are partly supported through the Noyce Teacher Scholarship Program. Preparation is explicitly geared towards teaching within the Chicago Public School system. Admission into UChicago UTEP requires a strong background in mathematics or biology, with further coursework in these subjects mandated throughout the two-year program. At the same time, UChicago UTEP prepares its students to teach in urban schools in several ways, for example: A “Soul Strand” seminar that attends directly to issues of race, class, culture, privilege, and personal identity; 10 to 15 structured field visits to a variety of urban middle and high schools; two semester long student teaching placements in Chicago Public Schools. For three years after receiving their degrees our graduates receive bi-weekly one-on-one coaching sessions and attend monthly induction sessions with members of their graduating cohort. In 2011 UChicago UTEP Secondary produced its first graduates, all of whom are teaching in underserved schools on Chicago’s south and west sides. Currently 21 students are enrolled in the first or second year of the program; our goal is to expand to 20 to 30 students per year within three years. UTEP’s elementary education program has an over 90% retention rate within the public school system in Chicago in its nine years of existence, and the secondary component seeks similar results.

119
Title: Streamline to Mastery: Realizing Agency and Leadership through Teacher-Driven Professional Development
NSF Noyce Award Number: 0934921
Principal Investigator: Valerie Otero
Email: Valerie.Otero@colorado.edu
Institution: University of Colorado, Boulder
Co-PI(s): Valerie Otero, University of Colorado-Boulder, Valerie.Otero@colorado.edu
Laurie Langdon, University of Colorado-Boulder, Laurie.Langdon@colorado.edu
Noah Finkelstein, University of Colorado-Boulder, Noah.Finkelstein@colorado.edu
Presenter(s): Laurie Langdon, University of Colorado-Boulder, Laurie.Langdon@colorado.edu

In the current era of top-down reform legislation teachers often feel under attack, unsupported, and virtually alone in their attempts to meet the needs of their students. The NSF-funded Streamline to Mastery professional development program has created a community of teachers and researchers engaged in re-professionalizing teaching through collective engagement in peer-reviewed research, local and national teacher education, and representation of teachers’ perspectives on national committees and in reform movements. Through these activities and the intense collaboration they require, the Streamline teachers are finding agency and voice both in examining and improving their own practices and in bringing teacher voice to the national dialogue on education reform. A summary of teacher research, activism, and future work will be presented.

120
Title: Noyce Teacher Teams: Phase II Scholarship Program at University of Colorado Boulder
NSF Noyce Award Number: 1240073
Principal Investigator: Valerie Otero
Email: Valerie.Otero@colorado.edu
Institution: University of Colorado, Boulder
Co-PI(s): Laurie Langdon, CU Boulder, Laurie.Langdon@colorado.edu
Noah Finkelstein, CU Boulder, Noah.Finkelstein@colorado.edu
Presenter(s): George Ortiz, CU Boulder, George.Ortiz@colorado.edu
Laurie Langdon, CU Boulder, Laurie.Langdon@colorado.edu
URL(s): http://noyce.colorado.edu/

This Phase II project builds on the Teaching to Learn philosophy that undergirds successful programs including the Colorado Learning Assistant Program. This project is designed to integrate, expand, and align teacher preparation, induction, and mastery by bringing together Noyce Teacher Teams—teachers and prospective teachers with different types and levels of experience. The focus of each team of veteran teachers, novice teachers, and Noyce scholars is on conducting classroom re-
search, and the goal of this centralizing activity is the critical examination of assumptions about teaching and learning. The mechanism by which such reflection occurs is scientific inquiry into one’s own practice, the practices of others, and the practices of students. All participants play critical, productive roles as knowledge producers as well as expert learners.

The Teaching to Learn Program is a collaboration of the University of Colorado Boulder and seven other local school districts associated with former and current Noyce projects. In Spring 2013, we piloted three Noyce Teacher Teams. The high school science team investigated the use of technology in their classrooms and how it affects students’ attitudes towards learning science. The high school math team implemented inquiry-based lessons and compared outcomes to more traditional lessons. The middle school math team focused on differentiation and grouping to see its effects on special education students’ attitudes towards math. The teams presented posters of their initial work at the end-of-semester Learning Assistant and Noyce Poster Sessions. The veteran teachers on the high school science team are also Master Teaching Fellows in our Noyce Streamline to Mastery program.

In 2013/14, we anticipate scaling up teams to 10 new Noyce scholars and 8 to 10 new teachers to participate in year-long classroom research projects. As our Noyce scholars start teaching within partner school districts, they will be able to participate as novice teachers in our model. Thus, this project is structured to provide induction support for our new teachers, leadership opportunities for our veteran teachers, and strengthen the network of former and current Noyce scholars in the region. The program also seeks to strengthen our pool of highly qualified mentor teachers who work with all of our STEM teacher candidates in the CUTFeach certification program. As ongoing evaluation and formative assessment for improving the program, we are conducting periodic interviews with all participants, videotaping teacher team meetings, and assessing initial research projects completed by the pilot teacher teams. Preliminary results from this early implementation of Noyce Teacher Teams will be presented.

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Title: Promoting Undergraduate Licensure in Science Education (PULSE)

NSF Noyce Award Number: 1136122
Principal Investigator: Doris R. Kimbrough
Email: doris.kimbrough@ucdenver.edu
Institution: University of Colorado, Denver
Co-PI(s): Leo P. Bruderle, University of Colorado Denver,
leo.bruderle@ucdenver.edu
Laurel Hartley, University of Colorado Denver, laurel.hartley@ucdenver.edu
Robert M. Talbot, University of Colorado Denver, robert.talbot@ucdenver.edu

Bryan S. Wee, University of Colorado Denver, bryan.wee@ucdenver.edu
Presenter(s): Leo P. Bruderle, University of Colorado Denver, leo.bruderle@ucdenver.edu
URL(s): clas.ucdenver.edu/PULSE_Noyce

The PULSE Noyce Scholarship Program at the University of Colorado Denver is currently in its second year. Our goals include recruiting undergraduate science majors with academic talent and financial need, and preparing them to pursue a secondary science teaching career in settings that have the greatest need for excellent teachers. Recruitment efforts target students in groups that are under-represented in K-12 science education, particularly those with disabilities. Over the course of the grant, the PULSE Program plans to prepare and license, place, and successfully induct 25 secondary science teachers who are committed to serving in high need settings; six students were accepted into the Program in Fall 2012, and we are currently recruiting our second cohort.

The PULSE Program provides recruitment activities, a formal program of preparation for licensure, field-based experiences in high need settings, a variety of formal and informal teaching and career exploration opportunities, STEM or STEM education research experiences, and newly developed internships and coursework to increase the number of STEM majors who pursue secondary science teaching and the quality of their preparation. CU Denver is collaborating with Aurora Public Schools (APS), which serves as the site for many of our field and other learning experiences. Noyce Scholars are being licensed through the Urban Community Teacher Education program, which was recently redesigned by our School of Education and Human Development to reflect research and best practice in preparing teacher candidates for urban classrooms. Our Scholars are participating in program-specific learning experiences that leverage existing institutional strengths (e.g., science research and urban teacher education) and a strong partnership with APS to provide a multifaceted and developmental set of experiences that span from freshman year through induction. The learning experiences of the Noyce Scholars is expected to serve as a model for integrating undergraduate science education, science research, preparation to teach in urban settings, and strong induction-years support. The development, deployment, and evaluation of this model will contribute to a better understanding of urban science teacher preparation and support. Our partnership with APS and structured induction support offers a strong model for other teacher preparation programs and for STEM recruitment and retention efforts in high need districts.
122
Title: Rocky Mountain Noyce Scholars Program
NSF Noyce Award Number: 0934945
Principal Investigator: Diana White
Email: diana.white@ucdenver.edu
Institution: University of Colorado, Denver
Presenter(s): Diana White, University of Colorado, Denver
URL(s): rmns.p.ucdenver.edu

The Noyce Math Scholars project at the University of Colorado Denver (UCD) aims to recruit mathematics students with academic talent and financial need as secondary math teachers and to prepare them in an exemplary manner to pursue a teaching career in a high needs school district. The Noyce Scholars are eligible to receive scholarships for up to two years. The program involves recruitment activities, newly developed coursework, and activities aimed to increase both the number of mathematics majors who pursue secondary teaching and the quality of their preparation. The Noyce Mentor facilitates many of these activities and is helping the program’s leadership build a vital Noyce Scholarship learning community at UCD. To implement the program, UCD is collaborating with Aurora Public Schools (APS), which serve as the site for many field and informal learning experiences available to potential applicants and the Noyce Scholars. APS participates in the selection of the Noyce Scholars and actively recruits Noyce Scholars for potential employment in secondary mathematics positions. The Department of Mathematical and Statistical Sciences is collaborating in the redesign of the undergraduate secondary math teacher component of this program with the Noyce Scholarship Program leading the cutting edge of this redesign.

124
Title: Robert Noyce Scholarship Program at the University of Houston: Recruitment, Retention and Program Instructional Strategies
NSF Noyce Award Number: 0833342
Principal Investigator: Laveria F. Hutchison
Email: lhutchison@uh.edu
Institution: University of Houston
Co-PI(s): Laveria F. Hutchison, University of Houston, lhutchison@uh.edu
Presenter(s): Jeffrey Morgan, University of Houston, jmorgan@math.uh.edu
URL(s): www.teachhouston.uh.edu/Scholarships.html

Recruiting, selecting and retaining candidates that meet our criteria for Noyce scholars can be quite challenging. Identifying effective instructional strategies that work for all learners can be equally challenging. Our program has employed a variety of strategies to find high caliber mathematics and science certificating students meeting our high standards at the undergraduate level. In addition, we have found research-based instructional strategies to demonstrate to our scholars that are effective for all student learners. These strategies have ranged from recruitment websites to presentations held on our campus. Each semester our programs evaluate the recruiting strategies used and modify our plan according to the data results. Intertwining our program admission criteria with our Noyce selection criteria has allowed for focused recruitment plans further aiding
in our success at finding Noyce scholars. Similar to our variety of recruiting strategies, we employ an array of research-based instructional strategies that range from note taking to data charts for the purpose of providing effective instruction. The inclusion of instructional strategy demonstrations provides effective ways for our scholars to teach all learners in school settings.

Our poster presentation will share our successes with recruiting and selecting candidates, data collected that shows the impact on the student achievement that NOYCE scholars have made in school settings, stories from our scholars and lessons learned for continued growth and success.

125
Title: University of Houston Robert Noyce Scholarship Program: Recruitment, Preparation and Retention of Teachers for Secondary Physics and Chemistry Education
NSF Noyce Award Number: 1240083
Principal Investigator: Donna Stokes
Email: dstokes@uh.edu
Institution: University of Houston
Co-PI(s): Paige Evans, University of Houston, pevans@uh.edu
Presenter(s): Paige Evans, University of Houston, pevans@uh.edu
Geoffrey Hart, University of Houston, ghart2012@gmail.com

The University of Houston Robert Noyce Scholarship Program is addressing the shortage of qualified physics and chemistry teachers through recruitment, preparation and retention of science and math majors for teacher certification in physics and chemistry. The program, built on the successes of the University’s teachHOUSTON program, is annually providing (1) 12 paid summer internships for lower division undergraduates to work with science master teachers at a middle school STEM camp for underserved students and to work in a research laboratory with physics or chemistry professors; (2) early teaching experiences for scholars in high need schools with established partner school districts; (3) $12,000 scholarships for 6-12 junior/senior level physics and chemistry majors/minors and post baccalaureate students per year seeking physics/chemistry teacher certification who commit to teaching two years in a high-need school district for every year of scholarship support after graduation; and (4) a Physics By Inquiry Course which engages scholars and STEM majors in teachHOUSTON in effective, inquiry-based teaching pedagogies for physics and chemistry.

This program has the potential to provide content knowledgeable physics/chemistry teachers to underserved schools in the Houston area, provide innovative methods for recruitment, preparation, and retention of physics/chemistry teachers to other institutions and promote active inquiry-based methods for teaching, training, and learning physics/chemistry which will lead to improved teacher knowledge and enhanced student learning resulting in an increase in the number of students, particularly those from underserved populations, entering into STEM-related professions. Currently, there are 12 interns and 6 scholars in the Noyce Scholarship Program which started in August 2012.

126
Title: Robert Noyce Program in Mathematics at the University of Houston-Clear Lake: Getting Started
NSF Noyce Award Number: 1240038
Principal Investigator: Tom Fox
Email: fox@uhcl.edu
Institution: University of Houston-Clear Lake
Co-PI(s): Jana M. Willis, University of Houston-Clear Lake, willis@uhcl.edu
Presenter(s): Jana M. Willis, University of Houston-Clear Lake, willis@uhcl.edu

We will offer a Phase I Robert Noyce Teacher Scholarship Track in mathematics at the University of Houston-Clear Lake (UHCL), an independent, upper-level (junior, senior and Master’s level) university located between Houston and Galveston, in a metropolitan area of over 4 million people. We are adjacent to the National Aeronautics and Space Administration Johnson Space Center. The university enrolls over 8,000 and offers 38 bachelor’s degrees, 44 master’s degrees and one doctoral degree in four schools: Education, Business, Human Sciences and Humanities, and Science and Computer Engineering.

Our program will capitalize on the outstanding resources and programs in our area to provide scholarship students expertise in: 1) mathematics content, 2) pedagogy, 3) teaching critical thinking, 4) use of instructional technology and 5) working with English language learners. The plan is to provide scholarships to 3 cohorts of 5 undergraduate students. The cohorts will be grouped based on the year they enter the program. Our goal is to graduate at least 15 mathematics majors with teacher certification in 4-8 or 8-12 mathematics, and to have the graduates be successful in their profession.

The Robert Noyce Scholarship program at UHCL has elements of successful STEM teacher preparation models, adapted for our distinctive position as an upper-level institution serving primarily community college transfers. The program will be a comprehensive with recruitment, training and support for mathematics teachers. Students will interact with the program through three stages. In the First Stage, high school students, community college students and UHCL mathematics majors explore mathematics teaching as a profession; in the Second Stage, qualified UHCL students take part as Noyce Scholars, and in the Third Stage, students who have graduated become Noyce alumni and participate in further professional development and support as they fulfill their teaching commitment. Special features of the UHCL program include: strong partnerships with over 55 local schools in 22 school districts, partnerships with local agencies involved in the US Space Program, a nationally recognized teacher preparation program featuring a two-semester internship, and a focus on teacher scholarship.
on providing school districts with highly trained mathematics teachers. We will share our preparation plans, including data collection procedures, recruitment efforts, and the application process.

**127**
**Title:** Designing Degree Concentrations and Minors to Prepare Noyce Teachers for Optional Science Certifications  
**NSF Noyce Award Number:** 0934913  
**Principal Investigator:** Brad Hoge  
**Email:** hogeb@uhd.edu  
**Institution:** University of Houston-Downtown (UHD)  
**Co-PI(s):** Akif Uzman, UHD  
Jon Aoki, UHD  
**Presenter(s):** Brad Hoge, UHD, hogeb@uhd.edu

The Natural Sciences Department (NS) at the University of Houston-Downtown (UHD) offers degrees in Biology, Chemistry, Biotechnology, and Biology and Physical Sciences. Concentrations are also offered within each program. The UHD Noyce Teacher Scholarship Program encourages Noyce Scholars to enter into our Bachelor of Biology and Physical Science with Emphasis in Teacher Certification degree program (BPS). This is a flexible degree program designed specifically for the needs of our Noyce Scholars which allows students to complete requirements for teaching certification in a timely manner while also providing the opportunity to concentrate their studies in the life, physical, environmental, and/or earth sciences. Our experience has been that it is difficult for a Noyce Scholar to complete the Biology or Chemistry degrees and obtain teaching certification within their two years of Noyce program support.

The BPS degree allows students to earn concentrations in biology, geology, environmental science, forensic science, chemistry, or physics in addition to their teaching certification. Students can also minor in an area outside of their concentration. Noyce Scholars completing this program then have the option of testing for additional teaching certifications in these areas beyond the standard general science certification.

**128**
**Title:** UHD Noyce Mathematics Teacher Scholarship Program -- Year 2  
**NSF Noyce Award Number:** 1136222  
**Principal Investigator:** Rebecca Quander  
**Email:** quanderr@uhd.edu  
**Institution:** University of Houston-Downtown  
**Co-PI(s):** Tim Redl, UHD, redlt@uhd.edu  
Jackie Sack, UHD, sackj@uhd.edu  
Nancy Leveille, UHD, leveilleN@uhd.edu  
**Presenter(s):** Rebecca Quander, UHD, quanderr@uhd.edu  
**URL(s):** www.uhdnoycemath.org

The UHD Noyce Mathematics Teacher Scholarship Program provides $12,000 annual scholarships for admitted students and $2,700 summer stipends over five years. We accept mathematics majors in their junior and senior year including graduating seniors who will take no more than two years post-baccalaureate to complete the teacher certification program. Our goal is to graduate 30 Noyce Mathematics Teacher Scholarship recipients over the course of five years. In addition to providing scholarships to pre-service teachers, we have collaboratively designed courses offered in the mathematics department that both focus on secondary mathematics content, as well as secondary mathematics pedagogy. During the summer, we provide stipends to freshmen and sophomore students with strong mathematics backgrounds to work as peer mentors to middle and high school students enrolled in a summer STEM program at the college.

**129**
**Title:** The Louisiana Mathematics Masters in the Middle (LaM3) Project - Year 1  
**NSF Noyce Award Number:** 1240054  
**Principal Investigator:** Peter Sheppard  
**Email:** psheppard@louisiana.edu  
**Institution:** University of Louisiana at Lafayette  
**Co-PI(s):** Christina Eubanks-Turner, University of Louisiana at Lafayette  
Kathleen Lopez, University of Louisiana at Lafayette  
Patricia Beaulieu, University of Louisiana at Lafayette  
**Presenter(s):** Peter Sheppard, University of Louisiana at Lafayette  
**URL(s):** www.ullam3.com

The Louisiana Mathematics Masters in the Middle (LaM3) project represents a collaborative partnership with the University of Louisiana at Lafayette’s College of Education, College of Sciences, Lafayette Parish School System, Iberia Parish School System, Vermilion Parish School System, and the Allen J Celestine Foundation. This Master Teacher Fellowship program is anchored in intensive content and pedagogical graduate courses and in engaging practicum that allows our participants to maximize their pedagogical potential. We envision the LaM3 project as a way to better position Louisiana students and teachers in fulfilling both national and state ambitions. We will further leverage the knowledge and skills of this exceptionally talented mathematics teaching corps to foster, nurture, and unearth the hidden or unmet potential in students who are often underexposed to high-quality mathematics teaching. We have not yet completed year one of the project, but we have selected our core group of participants and thus will discuss our recruitment strategy and highlight profiles of our participants. We also developed mathematics and pedagogy coursework designed to lead to an Elementary Mathematics Specialist credential for participants in Summer 2014.
Title: The University of Maryland Noyce Scholars Program for Mathematics Teachers  

Principal Investigator: Lawrence M. Clark  
Email: lmclark@umd.edu  
Institution: University of Maryland  
Co-PI(s): Brian Hunt, University of Maryland, bhunt@umd.edu  
Presenter(s): Lawrence M. Clark, University of Maryland, lmclark@umd.edu  
URL(s): http://www.education.umd.edu/MathEd/noyce/  

Funded in 2011, the University of Maryland (UM) Noyce Scholars Program for Mathematics Teachers is a comprehensive recruitment and support program focused on identifying and preparing a diverse group of UM students for teaching mathematics in high needs middle and high schools. Two main goals drive the program: 1) exposing freshmen and sophomores to the mathematics teaching profession through tutoring opportunities and summer internships and 2) providing financial and professional development support to junior and senior mathematics/mathematics education as they prepare to become mathematics teachers.

To date, the program has awarded $14,000 scholarships to 8 UM Noyce Scholars, engaged over 30 UM freshmen and sophomores in early experiences in teaching mathematics through tutoring at local Prince George’s County Public Schools (PGCPS) middle and high schools, and placed 12 freshmen and sophomore interns in summer internships in area institutions and programs focused on mathematics teaching and learning. The activities of the 5-year grant are increasing in scope and reach; there is much interest in PGCPS to add more schools to the tutoring component and great interest by organizations engaged in mathematics teaching and learning to offer more internships. The program is preparing to offer induction supports to the first cohort of scholars who will enter their first year of employment as mathematics teachers in the 2013-2014 academic year.

Title: Learning Assistant Programs as Teacher Recruitment  

Principal Investigator: Andrew Elby  
Email: elby@physics.umd.edu  
Institution: University of Maryland  
Co-PI(s): Dan Levin, University of Maryland, dlevin2@umd.edu  
Lawrence Clark, University of Maryland, lmclark@umd.edu  
E. F. (Joe) Redish, University of Maryland, redish@umd.edu  
Joelle Presson, University of Maryland, jpresson@umd.edu  
Presenter(s): Andrew Elby, University of Maryland, elby@umd.edu  
URL(s): http://www.education.umd.edu/MathEd/noyce/  

Our project includes several programs for freshmen and sophomores designed to recruit Noyce scholars and other science teacher certification candidates. This poster discusses one of them, the Learning Assistant Program. Learning Assistants (LAs) are undergraduate teaching assistants working in reform-oriented undergraduate science courses. The LAs work about 5 hours per week facilitating inquiry-oriented learning, while simultaneously taking a 3-credit pedagogy course introducing them to the theory and practice of science learning and teaching. Although this program has many benefits for the LAs and the students they teach, our motivation for partially funding it through our Noyce program is teacher recruitment. We hope that “dipping their toes” into science teaching as LAs will encourage talented science majors to consider careers in teaching and to become Noyce Scholars.

Title: S2TLC: Supporting STEM Teaching and Learning through Communities  

Principal Investigator: Kathleen Davis  
Email: kdavis@educ.umass.edu  
Institution: University of Massachusetts Amherst  
Co-PI(s): Sandra Madden, UM, smadden@educ.umass.edu  
Barbara Madeloni, UM, madeloni@educ.umass.edu  
Paula Rees, UM, rees@ecs.umass.edu  
Stephen Schneider, UM, schneider@astro.umass.edu  
Presenter(s): Stephen Schneider, UM, schneider@astro.umass.edu  
URL(s): http://blogs.umass.edu/nsfnoyce/  

The project is a collaboration among faculty in the UMass Department of Teacher Education and Curriculum Studies, the College of Natural Sciences, the College of Engineering and public schools in the Pioneer Valley of Massachusetts, including Springfield Public Schools, Holyoke Public Schools, Greenfield Public Schools, Mahar Regional School District, and the Hitchcock Center for the Environment in Amherst. The UMass research team consists of Drs. Kathleen Davis, Sandra Madden, Barbara Madeloni, Stephen Schneider, and Paula Rees. A dynamic and interactive community of 20 in-service middle and high school mathematics and science teachers from partner school districts has this year engaged 20 pre-service teachers in their classrooms, as well as through a series of courses and regional institutes. We are working together in the development of multiple levels of professional communities of practice, both face-to-face and virtual, and in reflecting upon the effectiveness of the University’s one-year program for licensure.

The purpose of S2TLC is to increase the pipeline of highly effective STEM teachers who will increase student engagement and achievement. In particular, the project is: 1) providing in-service secondary mathematics and science teachers with professional development in effective inquiry-, place-based, and culturally responsive instructional practices, leadership, and mentoring skills; 2) revising and implementing an initial licensure teacher...
program for secondary mathematics and science teachers in order to better ensure their retention in the profession and successful instruction; 3) developing virtual and face-to-face communities of practice to provide teachers with support for effective instruction and to lessen the traditional isolation of classroom teachers; and 4) developing mathematics and science content courses that integrate the use of cognitive technological tools to facilitate learning.

133
Title: Center for University, School & Community Partnerships (CUSP) at University of Massachusetts Dartmouth Master Teaching Fellow/Teaching Fellow Program: NSF TEACH! SouthCoast STEM
NSF Noyce Award Number: 1136382
Principal Investigator: Karen O’Connor
Email: koconnor@umassd.edu
Institution: University of Massachusetts Dartmouth
Co-PI(s): Tesfay Meressi, UMass Dartmouth, tmeressi@umassd.edu
Abby Spargo, Ocean Explorium, aspargo@oceanexplorium.org
Presenter(s): Kimberly Welty, UMass Dartmouth, kwelty@umassd.edu
Karen O’Connor, UMass Dartmouth, koconnor@umassd.edu
URL(s): cuspma.org

The Center for University, School & Community Partnership's Master Teaching Fellow/Teaching Fellow Program “NSF TEACH! SouthCoast STEM” is in its second year at the University of Massachusetts Dartmouth (UMD). We successfully recruited 16 MTFs and 9 TFs the first year. These participants have spent their first year in this program taking courses at UMD towards either their initial teaching license or teacher leadership certificate. This poster illustrates the members of our cohort, their background and experience, as well as progress made to date with the program and a glance at the future offerings over the course of the next four years.

134
Title: The Teacher Induction Network: Providing Continued Support to Teachers During Their First Years of Teaching
NSF Noyce Award Number: 0833250
Principal Investigator: Gillian Roehrig
Email: roehr013@umn.edu
Institution: University of Minnesota
Presenter(s): Gillian Roehrig, University of Minnesota, roehr013@umn.edu

The Teacher induction Network (TIN) is an on-line mentoring program for licensure completers in secondary science and mathematics. TIN incorporates reflective journals, topical discussion threads and professional development inquiries that provide a space for beginning teachers to continue to develop as teachers. Until recently, developers of online mentoring programs have used lesson plans as a proxy for direct observations of classroom practice. However, recent developments in video annotation methods and tools make the use of video for examining and improving reflective practices increasingly viable within online environments. Through the strategic development and use of video annotation tools within TIN, our beginning teachers’ reflections on their classroom teaching are linked directly to evidence through video as documentation. The integration of VideoAnt into TIN represents a promising practice that promotes the development of reflective practitioners and provides a free and user-friendly on-line platform for sharing and providing feedback on classroom teaching.

In addition to sharing the structure and components of TIN, this poster will discuss our research associated with the development of reflective practice through the use of video annotation within the online environment. Our analysis drew on a modified Learning to Notice Framework (van Es and Sherin, 2002) that proposes that the skill of noticing for teaching consists of two phases (describing and analyzing). Our analysis used four reflective stances: describing, explaining, evaluating, and interpreting. Through the use of video annotation, many teachers were able to develop higher level reflective stances of evaluation and interpretation.

135
Title: The University of Mississippi Noyce Teachers for a New Tomorrow (TNT) Program
NSF Noyce Award Number: 1240085
Principal Investigator: John O’Haver
Email: johaver@olemiss.edu
Institution: University of Mississippi
Co-PI(s): John O’Haver and Alice Steimle
Presenter(s): April Kilpatrick, The University of Mississippi, amkilpat@olemiss.edu
URL(s): http://olemiss.edu/cmse/noyce

Mississippi consistently demonstrates an urgent need for improvements in mathematics and science education. The University of Mississippi’s (UM Noyce Teacher Scholarship Program, Teachers for a New Tomorrow (TNT), provides support to expand and enhance the efforts of UM’s Center for Mathematics and Science Education (CMSE) in combatting this issue. Through the TNT Program, the CMSE provides unique scholarship opportunities for STEM majors wishing to pursue a career in mathematics or science education, thus increasing the number of certified secondary school teachers with strong content knowledge in math/science. STEM majors obtain teacher certification in science or mathematics by enrolling as a dual degree candidate in STEM and STEM Education or by enrolling in the School of Education’s Master of Arts in Curriculum and Instruction (MACI) program.
In addition to meeting course requirements, TNT scholars enrich their pedagogical knowledge by participating in the TNT Preparation Program, which is the CMSE’s established programs, events, and activities designed to train pre-service teachers, plus additional programs created specifically for TNT scholars. Once certified, TNT scholarship recipients fulfill their program commitment by teaching in a partnered high-need school district at least two years for each year a scholarship award was received. Currently, one Noyce Scholar, Katherine Brock, has successfully completed the first year of the TNT Program while completing her degree in Engineering. She will continue as a Noyce Scholar for the upcoming academic year as she obtains her teacher certification through the School of Education’s MACI Program. With funds readily available for the 2013-2014 academic year, recruiting efforts are proving more successful for the second cohort, as they began earlier and are still underway. Katherine will serve both as a mentor and as an active participant with the second cohort of Noyce scholars.

136
Title: Tomorrow’s Teachers with Dual Degrees
NSF Noyce Award Number: 0934839
Principal Investigator: Patricia Friedrichsen
Email: friedrichsenp@missouri.edu
Institution: University of Missouri
Co-PI(s): Mark Volkmann, Marcelle Siegel, Dorina Kosztin, John Adams, and Alan Whittington
Presenter(s): Marilyn Soucie, University of Missouri, souciema@missouri.edu
URL(s): http://t2d2.missouri.edu

The goal of the T2D2@MU project is to double the number of secondary science teachers graduating from the University of Missouri. To recruit science majors into our secondary science teacher education program, we designed new dual degree majors. This new degree program allows students to earn a degree in a science field (Biology, Chemistry, Environmental Geology or Physics) and a degree in Education. To recruit students into the dual degree program, we are using a variety of strategies. 1) Through brochures, fliers, guest speakers in large-enrollment science courses and our website, we are informing students of the dual degree program. 2) We are teaching an additional revised section of Introduction to Science Teaching to help students explore the dual degree program. 3) To explore science teaching as a career option, we are offering a total of 30 paid summer internships in informal science settings (Years 1-3). In addition, the Noyce program will provide a total of 50, 1-year $11,000 scholarships to eligible juniors and seniors in the dual degree program.

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Title: Tomorrow’s Teachers with Dual Degrees in Mathematics and Mathematics Education
NSF Noyce Award Number: 1035446
Principal Investigator: James Tarr
Email: tarrj@missouri.edu
Institution: University of Missouri
Co-PI(s): Carmen Chicone and Barbara Reys
Presenter(s): James Tarr, University of Missouri, tarrj@missouri.edu
Victor Soria, University of Missouri, soriav@missouri.edu
URL(s): http://tdm2.missouri.edu

Tomorrow’s Teachers with Dual Degrees in Mathematics and Mathematics Education is aggressively working to double the number of secondary mathematics teachers graduating from the University of Missouri’s (MU) undergraduate mathematics teacher education program through the recruitment of mathematics majors into mathematics teaching careers, preparation of these individuals to teach mathematics aligned with national standards, and support of mathematics teachers in their induction years. The project is providing summer mathematics teaching internships, dual degree programs (B.S. in Mathematics [for Math Education Dual Majors] and B.S. Ed. in Mathematics Education), and $10,000 annual scholarships for those committed to teaching mathematics in high-needs school districts. To increase teacher retention, the project will develop a cadre of mentor teachers in partner schools and supporting Noyce Scholars’ participation in professional mathematics teacher conferences.

The project’s broader impacts include: (1) Improvement in the quality and quantity of mathematics teachers for Missouri schools; (2) Building of new sustainable models for the recruitment, preparation, and retention of mathematics teachers to meet the teacher shortage; (3) Expansion and deepening of relationships between MU mathematicians, mathematics teacher educators, and K-12 teachers and administrators; and (4) The dissemination of findings from the external evaluation via conference presentations and publications.

138
Title: Learning Assistants Become Teachers (LABT)
NSF Noyce Award Number: 1136412
Principal Investigator: David Erickson
Email: david.erickson@mso.umt.edu
Institution: University of Montana
Co-PI(s): Richard Hutto, University of Montana, hutto@mso.umt.edu
Presenter(s): David Erickson, University of Montana, david.erickson@mso.umt.edu
Maddey Frey, University of Montana, maddey.frey@umontana.edu
Megan Sutherland, University of Montana,
megan1.sutherland.umontana.edu
URL(s): http://coehs.umt.edu/nsfnoyce/

The Learning Assistants Become Teachers project at The University of Montana is completing the first year in which scholars worked as learning assistants in faculty mathematics and/or science classes helping undergraduates learn content the scholars recently learned. During the second year of the project, scholars will take the model to the secondary schools, encouraging 7-12 classroom teachers to implement the model with their own students and colleagues with slightly younger students such that each 7-12 student is learning essential content. The successful implementation of the model will allow additional secondary students to know earlier than college that they are interested in helping others learn mathematics/science, thus increasing the number of potential mathematics and science teachers in rural Montana.

139
Title: Professional Development for Teacher Scholars in Science and Mathematics: The UNH Noyce Teacher Scholarship Program
NSF Noyce Award Number: 1035443
Principal Investigator: Sharon McCrone
Email: Smy72@unh.edu
Institution: University of New Hampshire
Co-PI(s): Neil Portnoy, Dawn Meredith, Tim Fukawa-Connelly, Sharon Oja, and Judy Robb
Presenter(s): Neil Portnoy, UNH, neil.portnoy@unh.edu
Sharon McCrone, UNH, Smy72@cisunix.unh.edu
URL(s): unh.edu/ployce

The Noyce Scholarship Program at UNH is designed to prepare highly talented individuals from a range of STEM disciplines for middle and secondary school teaching. Like many states, New Hampshire has a critical shortage of science and mathematics teachers, particularly in rural areas, where recruitment and retention of qualified teachers has always been a struggle. To help alleviate the shortage, our program couples strong preparation in content area and pedagogy with clinical experiences in rural settings and provides mentoring and professional development during the novice teachers’ induction years.

Our poster will focus on professional development experiences in which UNH Noyce Scholars have engaged. All undergraduate Scholars and all post-graduate interns have participated in these workshops aimed at supporting professional learning. Professional development workshops in the 2012/2013 academic year have focused on varied topics: (1) Creating interdisciplinary lessons in mathematics and science; (2) Design principles (based on constructivist learning theories) for creating science lessons; (3) Issues and experiences with rural communities and schools; (4) Lesson study in both mathematics and science; and (5) Issues and ideas in teaching English language learners (ELL) in mathematics and the sciences. Our poster will provide details of these workshops and resulting plans for the next academic year.

140
Title: UNCG’s Project ExSEL Examines Efficacy of Service Learning for Pre-Service High School Science Teachers
NSF Noyce Award Number: 0833280
Principal Investigator: Jerry Walsh
Email: jwalsh@uncg.edu
Institution: University of North Carolina, Greensboro
Co-PI(s): Jerry Walsh, UNCG, jwalsh@uncg.edu
Presenter(s): Valerie Vickers, UNCG, vgvicker@uncg.edu
Chelsea Joyce, UNCG, cnjoyce3@uncg.edu
URL(s): http://soe.uncg.edu/exsel/

Project ExSEL requires that interns and scholars do service learning in the area of science and science education, either in the summer or during the semesters of receiving the stipends or scholarships. The efficacy of this requirement is being studied with surveys from the past and current recipients of the stipends/scholarships to assess the value and importance to pre-service science teacher preparation. In addition, the type of service learning; the amount of time or number of hours; the type of supervision; the type of research; the target audience; and methods of reflecting on the experiences will be presented. One pre-service teacher’s experience will be offered by a scholar who has chosen to work at the Greensboro Science Center in a variety of capacities, teaching all ages about the animals and habitats at the center. She will reflect on the experience as a component of ExSEL and pre-service teacher training.

141
Title: UNT Science and Math Robert Noyce Scholarships Phase II: Commitment to Prepare and Retain Highly Qualified Math and Science Teachers
NSF Noyce Award Number: 1035312
Principal Investigator: Colleen M. Eddy
Email: Colleen.Eddy@unt.edu
Institution: University of North Texas
Co-PI(s): Pamela E. Harrell, University of North Texas, Pam.Harrell@unt.edu
John Quintanilla, University of North Texas, John.Quintanilla@unt.edu
Lee Hughes, University of North Texas, Lee.Hughes@unt.edu
Presenter(s): Colleen M. Eddy, University of North Texas, Colleen.Eddy@unt.edu and Pamela E. Harrell, University of North Texas, Pam.Harrell@unt.edu
URL(s): http://www.unt.edu/noyce/

The University of North Texas began Phase II of the Science and Mathematics Robert Noyce Scholarship Program in 2010. As of December 2012, 22 undergraduate and four graduate students have been awarded scholarships. Among the 26 Phase II scholars, 66% are mathematics majors and the GPA mean is 3.46 (SD
Thirty-nine Noyce Interns received early educational experiences, skills, pedagogical content knowledge, and content knowledge. Advanced scores in pedagogical skills, diversity skills, professional... 

The Noyce Scholarship Program of the University of Northern Colorado (UNC) began in September 2010. Our project had five goals: 1) increase the number of STEM teachers graduating from UNC; 2) increase number of STEM professionals completing teaching licenses; 3) increase number of early STEM education experiences for students; 4) provide ongoing mentoring and professional development support of STEM teachers during their induction year; and 5) assess, disseminate, and sustain the best recruitment and retention practices.

To implement the program, UNC partnered with 25 school districts, 19 of these are in rural communities where the need for STEM teachers is high. Since Fall 2010, we selected 32 Noyce Scholars and 6 Noyce Post-Bac Scholars. We offered scholarships to more individuals than originally proposed (32 compared to the proposed 22). The amount of scholarship per semester doubled the proposed $14,200. The majority of math and science teachers produced in Iowa come out of three state universities: the University of Northern Iowa, Iowa State University, and the University of Iowa. The state has a shortage of mathematics and science teachers and the Noyce scholarships have helped increase the number of candidates in the pipeline by 22 percent (for math) and 63 percent (science) over the last four years. A variety of pathways to licensure exist: traditional undergraduate science or math majors plus certification, post-bachelors certification, MAT, and new options for nontraditional licensure or a 4 + 1 BS/MAT program. The three universities joined forces for Noyce.

Two Noyce Scholars graduated in Spring 2011, started teaching in high-need schools, and completed their teaching obligation for the scholarship. Nine more Noyce Scholars are now teaching science in high-need school districts. An additional five are graduating in May 2013 and will plan to start their teaching careers in Fall 2013. Evaluation data on teaching effectiveness of all these teacher candidates show on average proficient to advanced scores in pedagogical skills, diversity skills, professional skills, pedagogical content knowledge, and content knowledge. Thirty-nine Noyce Interns received early educational experiences through their internships; ten of these developed their commitments to teaching and later became Noyce Scholars. Thus far, we have had great success in recruiting excellent candidates as Noyce Scholars and Noyce Post-Bacs. Our challenge has been meeting our annual target goals for the number of Noyce Interns.

The practices making an impact are: 1) scholarships and internships are helping potential teachers to commit to teaching and to commit to teaching where they are needed most; 2) the support of Noyce Teachers during their induction year is critical; 3) creating a network for STEM teachers and teacher candidates has increase support from peers; 4) the lessons learned from the Noyce Program influenced the redesign of our teacher preparation program by increasing early educational experiences; and 5) the Noyce Program has increased the awareness of the need for science and math teachers and established it as a priority for support from our dean, provost, and president.
The University of Puerto Rico in Rio Piedras is developing a Robert Noyce Master Teacher Fellowship initiative in collaboration with the Puerto Rico Department of Education (PRDE) to establish the first Puerto Rico Master Math Teacher Program (PRMMTP). This project will certify ten 7-12 grade mathematics teachers, who teach in high-need school districts, as Master Math Teachers (MMT) through the University of Puerto Rico Rio Piedras Campus Division of Continuing Education. The MMTs are being trained to offer professional development to math teachers at the Professional Math and Science Resource Centers (PMSRC) that have been established throughout the Island by the Puerto Rico Math and Science Partnership (PRMSP). The MMTs will serve as role models of exemplary mathematics teaching practices, content knowledge, and leaders among their peers to promote improvements in student academic achievement. All participants have completed or are in the process of completing a Master’s Degree, and have a professional track record of excellence in teaching. The PRMMTP consists of two phases.

During phase one, they participate in an intensive certification program followed by a period where the MMTs serve as professional developers while they complete the five years of service required by this program. In the second phase, the certified MMTs will assume leadership roles within high need school districts. Activities will include serving as mentors, participating in curriculum development projects, participating in pre-service teacher education, and assisting in the development and implementation of professional development for other teachers, particularly in the PMSRCs. MMTs will also participate as Cooperating Teacher during the practicum of 7-12th grade pre-service math teachers, and as mentors for beginning teachers. To evaluate the impact of the PRMMTP, student achievement in mathematics attained by students of teachers in the Master Teachers project will be assessed through the standardized math tests which are administered in all schools by the PRDE. Students of NSF MMT Fellows will be paired with comparable students taught by teachers from comparable high need schools using a matched-control group pre/post design. Results of these evaluation/research projects would be used to identify elements that enhance students’ academic achievement in math.

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Title: Preparing Highly-Qualified Mathematics and Science Teachers for High-Need Schools Phase II: A Snapshot into “Reform-minded” Second-Year Classroom Teachers’ Practice
NSF Noyce Award Number: 1136212
Principal Investigator: Raffaella Borasi
Email: rborasi@warner.rochester.edu
Institution: University of Rochester
Co-PI(s): April Luehmann, University of Rochester, ALuehmann@Warner.Rochester.edu

Jeff Choppin, University of Rochester, jchoppin@Warner.Rochester.edu
Terry Platt, University of Rochester, terry.platt@rochester.edu
Wendi Heinzelman, University of Rochester, wendi.heinzelman@rochester.edu
Judith Fonzi, University of Rochester, jfonzi@Warner.Rochester.edu
Presenter(s): Constance Flahive, Warner Center for Professional Development and Education Reform, cflahive@warner.rochester.edu
URL(s): http://www.warner.rochester.edu/

This evaluation study of the Noyce Scholars Project at the University of Rochester looks at second year mathematics and science teachers working in high-needs districts, the Noyce Scholars from the Warner Graduate School of Education. Using the highly tested and well documented instrument called Reform Teaching Observation Protocol (RTOP) (Sawada & Piburn, 2000) to guide a classroom observation and subsequent interview, this step in the larger evaluation focused on the question: What does the RTOP instrument tell us about Noyce Scholars’ reform-based classroom practices as novice teachers? Findings offer insights into what aspects of reform-based teaching are being implemented in early-career graduates’ classrooms. Our analysis found teachers facilitated student-to-student interactions that integrated student thought and voices into lessons. However, they faced challenges in providing opportunities for students to practice self-reflection on the lessons learned. Identifying common challenges that novice reform-minded STEM teachers encounter in their instructional practices is helping the Warner program to provide meaningful support to novice teachers graduating from the program.

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Title: The University of South Alabama Noyce Pathways to Mathematics Program
NSF Noyce Award Number: 1135621
Principal Investigator: Andre Green
Email: green@southalabama.edu
Institution: University of South Alabama
Co-PI(s): Madhuri S. Mulekar, University of South Alabama, mmulekar@southalabama.edu
Phillip Feldman, University of South Alabama, pfeldman@southalabama.edu
Katherine Malone, Bishop State Community College, kmalone@bishop.edu
Presenter(s): Andre M. Green, University of South Alabama, green@southalabama.edu
Kelsey Hinkel, University of South Alabama, Noyce Scholar
krh1103@jagmail.southalabama.edu
URL(s): www.usapathwaytomathematics.com

Pathways to Mathematics (PTM) is a collaborative program between the University of South Alabama Colleges of Education,
Goals:

- PTM will prepare a total of up to 25 mathematics teachers (over the five-year period) who will be certified to teach mathematics at the secondary level. PTM seeks to create a steady stream of future alternative master’s degree mathematics education majors, which in turn will increase the number of mathematics teachers available to teach in local school systems.
- PTM will enhance middle and high school student achievement by providing certified mathematics teachers in high needs schools that currently lack certified math teachers.
- PTM will create a replicable model to provide ongoing mentoring and professional development for novice mathematics teachers that will increase the likelihood that they will be retained and become career teachers.
- PTM will double the number of math teachers (8 candidates total) who earn their certification from the University of South Alabama by creating a pipeline of undergraduate students beginning at the community college level and culminating in an earned master’s degree and certification in secondary mathematics education.

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Title: Getting Their Feet Wet: The University of South Carolina Science and Mathematics Teacher Initiative Robert Noyce Pre-Service Teacher Scholarships

This poster highlights the three-course series of one-hour practicum classes designed to introduce University of South Carolina STEM underclassmen to teaching and then, once selected as a Noyce Scholar, gives them more opportunities to observe STEM teaching in local high schools as upperclassmen.

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Title: Using Photo-elicitation to Uncover Noyce Fellow’s Concerns about Interning

This study sought to uncover pre-service teachers’ concerns about their upcoming internship experience. The subjects were Noyce Fellows enrolled in a master’s degree certification program in a large urban university in the southeastern US. At the time of the study, the Noyce Fellows were enrolled in a pre-internship field placement (practicum) and were expecting to begin their internships as full-time paid teachers of record the following fall. The Fellows’ concerns were uncovered using a photo elicitation method (Harper, 2002) with its roots in Photovoice (Wang, 1999).

At the beginning of the practicum, they were instructed to take photographs that would represent their response to the following questions: What are your concerns about teaching? What are some things that you hope to learn in your internship that will alleviate those concerns? They were told the photographs could not include images of people. They were then to choose three of those pictures and write a short paragraph for each photo explaining how it represented their concerns about teaching. The three photos and the three paragraphs were discussed at the next practicum meeting.

At the second meeting, midway in the semester, they selected one of the three photos and told why they chose it. For the final meeting, they took three new photos and wrote a paragraph about each. We found the Noyce Fellows had concerns about being overwhelmed, not having enough time to plan and grade, their ages, and instructional concerns. In addition, we found that they opened up to each other and to us about the ways in which their personal beliefs guided them through this process. (Collier, J. (1957). Photography in anthropology: A report on two experi-
Title: Tampa Bay Noyce Master Teacher Fellows (MTF) Program

NSF Noyce Award Number: 1239946
Principal Investigator: Gladis Kersaint
Email: kersaint@usf.edu
Institution: University of South Florida / Hillsborough County Public Schools
Co-PI(s): Larry R. Plank, Hillsborough County Public Schools, larry.plank@sdhc.k12.fl.us
Presenter(s): Larry R. Plank, Hillsborough County Public Schools, larry.plank@sdhc.k12.fl.us

This poster will provide information about the Tampa Bay Noyce MTF Program, which is a partnership between the University of South Florida (USF) and Hillsborough County Public School (HCPS), the 8th largest school district in the nation. From a pool of 67 teachers who met the minimum criteria and applied to the program, 20 effective teachers were selected to participate in a well-coordinated teacher education and professional development program designed to enhance their skills as teacher leaders so that they can support programs at both USF and HCPS. MTFs will complete a 12 credit hour Teacher Leaders for Student Learning graduate certificate program at USF that examines the links between teacher leadership, job-embedded professional learning, and student learning. In addition, the MTFs will engage in an ongoing Teacher Leadership Academy professional development program that includes both a predetermined structured component and opportunities to engage in professional development activities that are tailored to the needs of participants, who may participate as part of a whole group, content specific group, or independent study research activities designed to prepare them for their specific roles as teacher leaders in HCPS and USF. These PD activities will extend the foundations developed in the graduate certificate program and will allow MTFs to make direct links to their roles as teacher leaders in practice.

Title: The Digital Playground: Supporting Beginning Science Teacher Development

NSF Noyce Award Number: 1136442
Principal Investigator: Frederick W. Freking
Email: freking@usc.edu
Institution: University of Southern California
Co-PI(s): Doug Capone, University of Southern California, capone@usc.edu
Anthony Maddox, University of Southern California, amaddox@usc.edu

Su Oh, Natural History Museum, suoh@nhm.org
Presenter(s): Frederick W. Freking, University of Southern California, freking@usc.edu

The USC Robert Noyce Science Scholars Program has many levels of support. All USC Noyce Science Scholars are part of a cohort of science teachers that learn together and support one another through two pedagogy courses and two guided practice placements. To further support our USC Noyce Science Scholars, we have created an online Urban Science Teacher Network (USTN). The USTN will provide that additional support for our MAT@USC Noyce Scholars, their mentors, and select science teacher alumni. Our Noyce Scholars (n=16 in 2012-13) participate in synchronous online monthly meetings to share lesson plans, literacy strategies, management ideas, or any other topic these teachers deem necessary. Additionally, science teachers participate in an asynchronous online environment where they ask questions that are answered by the network, reducing the day-to-day feeling of isolation of science teachers in general and Noyce scholars in particular. We anticipate that well over one hundred teachers will actively participate in this network and we will use this forum to investigate the types of support that are necessary for greater retention.

Our Urban Science Teacher Network is the key vehicle to support our Noyce Scholars as they leave the MAT@USC and join the science teaching profession (n=4 in 2012-13). We plan to share the challenges and success of using an online community of practice in this poster presentation (data currently being analyzed). We believe this model takes an innovative approach to preparing new Noyce Scholars through participation in an online professional science teaching community. All USTN participants can hold their own online meetings and post lessons, videos and feedback to an asynchronous forum. Since this is an online community, our Scholars can participate wherever they choose to accept an urban science teaching position. The PI also holds a weekly online office hour where scholars and alumni can share any questions or concerns they may be experiencing as they participate in the USC Noyce Scholarship program. We look forward to sharing our Year 2 Noyce Scholars and our work together to improve urban science teaching.

Title: Noyce Scholarship Program at Southern Miss

NSF Noyce Award Number: 0630436
Principal Investigator: Deborah Booth
Email: Deborah.Booth@usm.edu
Institution: University of Southern Mississippi
Co-PI(s): Mary Peters, Mary.Peters@usm.edu; sherry.herron@usm.edu
Presenter(s): Deborah Booth, University of Southern Mississippi, Deborah.Booth@usm.edu

The University of Southern Mississippi has funded twenty-four undergraduates in our Noyce Scholarship Program. Of these
twenty-four undergraduates, four have fulfilled their agreements, fourteen are currently working in high need school districts and are in the process of fulfilling their agreements, three will graduate this May, and one student will graduate May 2014. We are evaluating the effectiveness of our Noyce Scholars in the classroom implementation of inquiry learning.

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Title: Teach/Here Building STEM Teachers for Urban Districts
NSF Noyce Award Number: 1035455
Principal Investigator: Susan Benner
Email: sbenner@utk.edu
Institution: University of Tennessee
Co-PI(s): Stu Elston, UTK
Dan Challener, Public Education Foundation, Chattanooga, TN
Presenter(s): Susan Benner, UTK
Geri Landry, UTK

The Teach/Here Urban Teacher Residency program is a partnership between the University of Tennessee (UTK), the Public Education Foundation, Hamilton County Schools, and Knox County Schools. It was designed to attract, prepare and retain high potential math/science teachers for high need, urban schools. The impact of the initiative is unfolding as our second cohort completes its first year of teaching, and the third cohort is nearing the end of the residency year. Through this focused year-long residency program that provides tuition waivers, stipends, and supportive mentoring into the first years of teaching, we have created an effective new approach to pre-service teacher development. A total of 24 graduates from the first two cohorts are now successfully teaching. These graduates are supported by Teach/Here’s Induction Coordinator and their respective school systems.

In addition to ongoing weekly planning meetings and classroom observations, the coordinator has begun collaborating with site-based instructional coaches to help graduates implement best practices as determined by school leadership. He has been in communication with principals about the graduates’ progress in successfully using these classroom practices. Graduates have also benefitted from monthly seminars that are conducted across the two districts via video conferencing with a site supervisor in Knoxville to address questions and concerns specific to that district. Graduates are required to report back to the group on how they have implemented the lessons learned from these seminars in their classrooms. We anticipate that 100% of the members of cohorts I & II who became secondary STEM teachers will remain in their placements in 2012-2013. Four members of Cohort 3 completed the first semester of the residency year and began the second semester of UTK coursework, a busy semester in which they will complete the edTPA, Action Research, and additional coursework. The poster will highlight the use of edTPA and other required teacher evaluations, and describe components of the urban specialist certificate programs provided to our clinical instructors.

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Title: Noyce Professional Development for Future STEM Educators at UTK
NSF Noyce Award Number: 1136102
Principal Investigator: Susan E. Riechert
Email: riechert@utk.edu
Institution: University of Tennessee
Co-PI(s): Susan Benner, University of Tennessee, sbenner@utk.edu
Presenter(s): Susan E. Riechert, University of Tennessee, riechert@utk.edu

We report here on special aspects of our Robert Noyce grant’s activities. Five Noyce Scholars are part of the first graduating cohort of the VolsTeach program representing Math, Physics, Chemistry and Biology majors. We are using Noyce F & A return funds to offer these graduating scholars, their parents and a favorite high school teacher or mentor teacher a special banquet celebratory event just prior to graduation. The grant, itself, offers student internship opportunities for spring, summer and fall terms with placements in some unique educational outreach opportunities, including working with the education branch of the National Institute for Mathematical and Biological Synthesis, developing and testing exercises for the K-12 Biology in a Box Project with its 100+ partnering school systems, as educator assistants with the Knoxville Zoo and as science and math docents at the Children’s Museum of Oak Ridge. This expansive array of opportunities allows our pre-service teachers to gain knowledge and skill sets that will equip them to be successful future high school and middle school teachers.

A final unique aspect of UTK’s Noyce Phase I Project entails the continued development of teaching skills in the area of “doing science” in the high school classroom and environs. Student teams complete modules on collaboration, research design and analysis while working through a project of their choosing that entails the cooperative effort of a 3-4 member team of mathematics and science majors.

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Title: Program Impacts on Mathematics, Chemistry and Physics Noyce Teacher Scholars
NSF Noyce Award Number: 0833434
Principal Investigator: Ann Cavallo
Email: cavallo@uta.edu
Institution: University of Texas at Arlington
Co-PI(s): Greg Hale, University of Texas at Arlington, greg@hale.uta.edu
James Epperson, University of Texas at Arlington, epperson@uta.edu
Ramon Lopez, University of Texas at Arlington, relopez@uta.edu
The Robert Noyce Scholarship Program for Science and Mathematics Teachers program (I) recruits and prepares highly qualified high school mathematics, chemistry, and physics teachers to teach in the Dallas, Arlington, and Fort Worth Independent School Districts. Our program is a collaborative effort among the University of Texas-Arlington’s College of Education and Health Professions, College of Science, and these surrounding urban school districts. Students in the Noyce program are enrolled in our successful UTeach replication program, UTeach Arlington. Noyce program objectives include: 1) recruiting mathematics and science teacher candidates from baccalaureate programs and career changers from local industry, 2) providing a quality two-track teacher certification program for our candidates, and 3) inducting, monitoring, and mentoring our teacher candidates through the program and their early years of teaching. Objective three is the primary focus of this presentation, as pre-program, mid-program, and post-program research and evaluation data has been collected on scholars beginning in year one (2009) to the present on the following variables: self-efficacy toward teaching science and math, views of nature of science; understanding and use of inquiry-based, constructivist teaching practices, and overall program evaluation. The analyses of these data inform and guide our Noyce program’s implementation and promote its quality. Results to date on our recruitment efforts and on research and evaluation of UT Arlington’s Noyce program and how results have guided its implementation will be presented.

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Title: Program Impacts on Earth/Life Science and Middle Level Science and Mathematics Noyce Teacher Scholars

Ann Cavallo, University of Texas at Arlington, cavallo@uta.edu
Greg Hale, University of Texas at Arlington, greg@hale.uta.edu
James Epperson, University of Texas at Arlington, epperson@uta.edu
Ramon Lopez, University of Texas at Arlington, relopez@uta.edu
Laura Mydlarz, University of Texas at Arlington, mydlarz@uta.edu

URL(s): http://www.uta.edu/cos/noyce/

The Robert Noyce Scholarship Program for Science and Mathematics Teachers program (II) educates and prepares highly qualified earth science, life science, and middle level science and mathematics teachers to teach in the Dallas, Arlington, Fort Worth and Hurst-Euless Bedford Independent School Districts. Our program is a collaborative effort among the University of Texas at Arlington’s College of Education and Health Professions, College of Science, Tarrant County College, and these four surrounding urban school districts. Students in the Noyce program are enrolled in our successful UTeach replication program, UTeach Arlington. Noyce program objectives include: 1) recruiting mathematics and science teacher candidates from baccalaureate programs and career changers from local industry, 2) providing a quality two-track teacher certification program for our candidates, and 3) inducting, monitoring, and mentoring our teacher candidates through the program and their early years of teaching. Objective three is the primary focus of this presentation, as pre-program, mid-program, and post-program research and evaluation data has been collected on scholars beginning in year one (2010) to the present on the following variables: self-efficacy toward teaching science and math, views of nature of science; understanding and use of inquiry-based, constructivist teaching practices, and overall program evaluation. The analyses of these data inform and guide our Noyce program’s implementation and promote its quality. Results to date on our recruitment efforts and on research and evaluation of UT Arlington’s Noyce program and how results have guided its implementation will be presented.

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Title: Impact of the Noyce Program on UTeach Dallas Implementation

Mary Urquhart, University of Texas at Dallas, urquhart@utdallas.edu
John Sibert, University of Texas at Dallas, jsibert@utdallas.edu
Bill Neal, University of Texas at Dallas, bill.neal@utdallas.edu
Homer Montgomery, University of Texas at Dallas, mont@utdallas.edu

URL(s): http://utdallas.edu/uteach/

UTeach Dallas has experienced phenomenal growth since the beginning of The Robert Noyce Teacher Scholarship Program at the University of Texas at Dallas in 2009. In Spring 2009, 63 students were enrolled. By 2013, we have grown to approximately...
350 students in the program, the majority of whom are STEM majors. We completed high fidelity replication of the nationally acclaimed UTeach model in summer 2012, and as of December had graduated 21 students with secondary science or mathematics teaching certification.

As a mature program, starting in 2013-2014, we anticipate graduating at least 50-60 new teachers per year. UTeach Dallas has a thriving induction program, coordinated with our sister replication site, Teach North Texas. We have achieved many successes, from obtaining a substantial investment from the university in terms of facilities and personnel to meeting our goal for our $2,000,000 endowment including the $1,000,000 National Math and Science Initiative challenge grant awarded in April 2013. Our graduates for this fledgling program are highly sought after, many being placed in curriculum writing and leadership positions as novice teachers. Our current students are active participants and leaders in STEM educational outreach to the local community. As with all UTeach replication sites, UTeach Dallas has hallmarks of early recruitment of STEM majors, paid internships, carefully selected mentor teachers, an infusion of cutting-edge classroom technology, experienced, high-quality Master Teachers, and induction support. Our data shows we are recruiting from among the best and brightest of the students at a university known for STEM research. The UTeach Dallas Noyce program has provided important students support in two categories that are critical to student recruitment and retention: internship funding and scholarships. Just as the growth of UTeach Dallas has been nearly double that predicted at the time of our Noyce proposal, we have had unanticipated challenges and successes with regard to the impact of Noyce on our overall secondary science and mathematics teacher certification effort. Noyce support, while an important part of college affordability for some students, has not been appealing to as many of our students as predicted. We attribute this to several factors, including UTeach Dallas demographics and commitments to teach in high needs schools, which we will discuss in our presentation.

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Title: A Concrete Example of How Formative Evaluation Can Improve a Project
NSF Noyce Award Number: 1035502
Principal Investigator: Eric Hagedorn
Email: ehagedorn@utep.edu
Institution: University of Texas at El Paso
Co-PI(s): Olga Kosheleva, UTEP, olgak@utep.edu
Laura Serpa, UTEP, lfserva@utep.edu
Amy Wagler, UTEP, awagler2@utep.edu
Ronald Wagler, UTEP, rwagler2@utep.edu
Presenter(s): Eric Hagedorn, UTEP, ehagedorn@utep.edu
Isla Porras, UTEP, iaporras@miners.utep.edu
Randal Batchelor, External Evaluator, randbatch@hotmail.com
URL(s): http://www.utep.edu/noyce

A key theme of the Robert Noyce Scholarships for Teaching Minors Program at the University of Texas at El Paso is the value of inquiry-based pedagogy. As such, our professional development workshops for Noyce Scholars always include inquiry-based activities that integrate mathematics and science. What formative evaluation (from focus groups and open-ended surveys) has indicated to us is that our emphasis on inquiry-based pedagogy was more from the perspective of the learner, and inadvertently neglected the perspective of the teacher. In other words, we were providing rich inquiry-based learning experiences for our Scholars, modeling the appropriate pedagogy, but we were not providing teaching oriented experiences.

In light of this, we have adjusted all our workshop activities to always include the future teacher perspective. We have done this by actually including teaching experiences for our Scholars during some workshops (with high school students or subsets of our Scholars acting as learners). When we have an inquiry-based learning experience for everyone, we always follow-up with a discussion (whenever possible with in-service teachers) emphasizing how you would provide this experience in the classroom including practical details. Finally, we try to include very practical presentations/activities provided by our cooperating teachers and district coaches. In life, a critical friend can have a huge positive impact on ourselves. The same may be said for our Noyce evaluators positively impacting our projects.

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Title: The University of Texas at Tyler Noyce Scholar’s Program: Supporting Future East Texas Teachers
NSF Noyce Award Number: 1035462
Principal Investigator: Bambi Bailey
Email: Bambi_Bailey@uttyler.edu
Institution: University of Texas at Tyler
Co-PI(s): Fredericka Brown, University of Texas at Tyler, fbrown@uttyler.edu
Michael Odell, University of Texas at Tyler, modell@uttyler.edu
Presenter(s): Bambi Bailey, University of Texas at Tyler, bbaily@uttyler.edu
Fredericka Brown, University of Texas at Tyler, fbrown@uttyler.edu

The University of Texas at Tyler Noyce scholars are selected from a talented pool of undergraduate students who are majoring in STEM fields and interested in science and mathematics education. There is a documented need for teachers in East Texas with strong backgrounds in STEM disciplines who are capable of teaching students in high needs school districts. Upon graduation, the Noyce scholars will be able to fill this void in the East Texas area. When interviewing the Noyce scholars, it became apparent that most of them had a high level of financial need. High levels of financial need have been linked to student persistence and departure decisions. This financial support received by the scholars helps them to focus on completion of their de-
The Noyce Scholars program at the University of Texas of the Permian Basin is in its fourth year of preparing highly qualified math and science teachers to meet the needs of our partner school districts in western Texas. More than 65% of the UT Permian Basin Noyce Scholars are female and ethnically Hispanic/Latino. The recruitment and retention of these students, who are historically underrepresented in the ranks of STEM teachers, is made possible by the financial, academic, and induction support provided by the project.

Title: University of West Georgia Noyce Teacher Scholarship Program
NSF Noyce Award Number: 1239957
Principal Investigator: Dianne Hoff
Email: dhoff@westga.edu
Institution: University of West Georgia
Co-PI(s): Christopher Tabit, ctabit@westga.edu, and Jill Drake, jdrake@westga.edu, University of West Georgia
Presenter(s): Jill Drake, jdrake@westga.edu and Lindsey Robinson, lindseyr@westga.edu, University of West Georgia
URL(s): http://www.westga.edu/show_bio.php?emp_id=23747

The University of West Georgia (UWG) Noyce Scholars program aims to increase the number and retention rates of well-prepared, licensed secondary school teachers (grades 6-12) in science and mathematics in high-need schools in Georgia. In partnership with the Carroll County School System and the Carrollton City Schools, the Noyce project provides scholarships to 32 undergraduate students who complete their STEM baccalaureate degrees; supports 50 internships, which enables freshman and sophomore students to work in STEM summer programs; and gives a merit-based stipend of $150 each to 500 freshman and sophomore UTEACH students to test-drive STEM teaching by enrolling in UTECH 2001 and 2002, participating in course-embedded early field experiences, and earning a B or better in each course.

The merit-based stipends for UTECH 2001 and 2002 are the primary recruiting tools for attracting students to participant in the UWG Noyce Scholars Program. To date, the UWG Noyce project has awarded ten internships. The ten internships begin in May and conclude in July 2013. Noyce interns will be working with STEM faculty and in-service teachers gaining hands-on experience while interning with five Title II Teacher Quality grants, a Mathematics Clinic, and IMPACT, a STEM K-12 summer program. Additionally, five Noyce Scholars have been selected for the 2013-2014 academic year. The UWG Noyce project employs the UTeach teacher preparation model. Students major in mathematics or a science discipline and earn their teaching credential through specially designed, inquiry-based education courses.

The College of Education keeps programmatic data on all of our teacher preparation programs using a combination of TK20 and Banner databases. Data are collected and analyzed every semester, and all faculty participate in the assessment of students and programs. Programmatic data specific to Noyce Scholars is included in these databases and will incorporate scored unit plans for teaching, mentor teacher assessments, a dispositions assessment, data on student’s ability to affect student learning, and
scores on certification exams (GACE Content). The external evaluator for the UWG Noyce Scholarship Program, Michael Odell, will work with program faculty to assess the data that has been gathered, suggest enhancements to the program and evaluation designs, and assist with report preparation. He will also work with the Noyce PIs and Co-PIs to gather long term data about the students to answer these key program questions: 1) What is the impact of the support systems developed by UWG to enhance the teacher preparation experience for Noyce Scholars? 2) What is the impact of participation as a Noyce Scholar on their teaching and on student learning?

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Title: Changing the Path to Teacher Licensure for Non-traditional Students with Real-world Experiences as Mathematicians and Scientists

NSF Noyce Award Number: 0833324
Principal Investigator: Michael E. Beeth
Email: beeth@uwosh.edu
Institution: University of Wisconsin Oshkosh
Presenter(s): Michael E. Beeth, University of Wisconsin Oshkosh, beeth@uwosh.edu
Erich W. Eifler, Middleton Cross Plains School District, eeflfer@mcpsasd.k12.wi.us
Brenna Kunkel, University of Wisconsin Oshkosh, bbkunkel@svm.vetmed.wisc.edu
URL(s): http://www.uwfox.uwc.edu/academics/act2teach/

This poster showcases an alternative path to the recruitment and preparation of STEM teachers through the Alternative Careers in Teaching program (Act!). Act! is a partnership between six institutions of higher education in Northeast Wisconsin. One goal of Act! is to increase the number of licensed, highly qualified math and science teachers; a second goal is to recruit math and science teachers who have real-world experiences as mathematicians or scientists. Act! targets non-traditional adults with a Bachelor’s degree or higher and 5 or more years of work experience in math or science fields to transition into careers as professional educators. More than 110 individuals have enrolled in Act! since it began in 2006; and more than 530 individuals have inquired about this alternative pathway to becoming a teacher of math or science. We will showcase information on the administration of this multi-institution partnership, the customization of our curriculum to non-traditional adult learners, demographic information about the individuals accepted into Act!, recruitment and marketing activities, information on the employment option for the math and science teachers who have completed our program, and the professional growth and development activities our program completers are choosing during their induction years. Testimonial statements from current and former Act! students are also included in our poster.

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Title: Valdosta Noyce Scholars Science Teacher Preparation and Retention

NSF Noyce Award Number: 1240059
Principal Investigator: Brian L. Gerber
Email: blgerber@valdosta.edu
Institution: Valdosta State University
Co-PI(s): Thomas J. Manning, Valdosta State University, tmanning@valdosta.edu
Presenter(s): Brian L. Gerber, Valdosta State University, blgerber@valdosta.edu
URL(s): http://www.valdosta.edu/

To enhance STEM education in middle and high schools, a cadre of undergraduate science majors who might not have otherwise considered a career in K-12 teaching will be recruited to the teaching profession. These students will obtain both a bachelor’s degree in a science major (e.g. Biology, Chemistry, Geosciences, Physics or Astronomy) and teaching certification. The field experiences for these student teachers will take place in public middle and high schools within the Valdosta City School (VCS) System. Program components for the proposed project have been conceived and modified through a collaborative process between Valdosta State University (VSU) faculty in the College of Arts & Sciences and the College of Education along with the VCS Superintendent and schools. To address the goal of improved STEM subject learning for all students, they developed an action plan to enhance teaching and learning based on the premise that effective professional development and teacher education enhances student learning (Milken Family Foundation, 2000). Scholars will enter the program through a two-part internship which begins after their sophomore year and enter into the Scholarship phase of the program during their junior year. The dual internships will provide a mechanism for early recruitment of STEM students and one for early exposure to STEM teaching opportunities. The Scholarship phase of the program is designed to prepare the scholars for successful teaching career and focuses on: 1. Reducing professional isolation through collaborative learning (a. Community of Learners, b. Enhanced Mentoring, and c. Professional Science Education Societies), and on 2. Enhancing STEM and pedagogy content competencies (a. Enhanced Information Dissemination, b. Content Delivery, c. Field Experiences, and d. Implementation Budget). This combination of enrichment and support will result in increased teacher retention and increased student performance. Upon completing the science teacher preparation program, teachers will be equipped to facilitate science education in an engaging and relevant way that captivates their students and integrates science content across the curriculum.

Objectives include: 1. Twenty (20) academically talented but financially needy science majors (e.g. Biology, Chemistry, Geosciences, Physics or Astronomy) will be recruited into VSU’s Science Teacher Preparation Program and provided Noyce Scholar-
Title: VCU Noyce Initiative Evaluation Report Y1-4

NSF Noyce Award Number: 0934552
Principal Investigator: Jacqueline T. McDonnough
Email: jtmcdonough@vcu.edu
Institution: Virginia Commonwealth University
Co-PI(s): Alison Baski, Virginia Commonwealth University, aabaski@vcu.edu
Sally Hunnicutt, Virginia Commonwealth University, sshunnic@vcu.edu
Presenter(s): Jacqueline T. McDonnough, Virginia Commonwealth University, jtmcdonough@vcu.edu
URL(s): http://www.soe.vcu.edu/academics-programs/departments/teaching-and-learning/overview/

The VCU Noyce Initiative is an integrated collaborative project between the School of Education and the College of Humanities and Sciences, in partnership with the Richmond City, Henrico County, Chesterfield County, and Hopewell City School Districts. The program will support and prepare undergraduate and post-baccalaureate students to be effective secondary science teachers in high-needs schools. Undergraduate students are recruited in their junior year and initiated into teaching through an internship program at a summer enrichment camp for middle school students from high-need schools. Program Statistics for years 1-4 include: Scholars Supported: 29, Undergraduates Supported: 6, Scholars Graduated: 13, Scholars Teaching in High Need Districts or Schools: 13, Scholars Currently Student Teaching: 13, and Scholars slated for funding Year 5: 5. The VCU School of Education’s Office of Assessment has played an integral role in providing qualitative and quantitative data to report Noyce Scholars’ progress. The analysis has provided information on recruiting, preparing, and retaining science teachers by comparing Noyce and non-Noyce scholars.

Data collected over time will provide answers to the following questions: How effective is the residency model at retaining science teachers? What are the major differences between students in the residency- and non-residency models? What is the difference in the preparedness of the residency-model students as compared to the non-residency model students? Does participation in an induction program based on the professional community model decrease teacher turnover in high-needs schools? Have science faculty attitudes towards high school science teaching changed as a result of interactions with the H&S Liaison?

Data collected specifically for this study are: (1) participant responses to pre- and post- interviews; (2) clinical evaluation scores; (3) faculty surveys pre- and post- interaction with H&S Liaison; (4) attendance at professional meetings; (5) recordings of professional community meetings; and (6) pre- post and post-post surveys concerning efficacy, appraisal, and expectancy. The procedures used for the data collected vary based on the type. All demographic data and academic achievement data are mined from Noyce scholar participants’ scholarship application forms and non-Noyce participants’ Teacher Preparation Program applications. State licensure exam data are collected from participants’ files in the SOE database. Course-based assessment and clinical evaluation data are stored in the rGRADE database. Pre- and post-faculty survey data were downloaded from the Inquisite website. Attendance at and recordings of the professional community meetings are collected as the meetings occur. Individual interviews with Noyce and non-Noyce scholars are conducted before students enroll in education classes and after they have completed all course work and field placements.

These interviews are recorded and transcribed. Participants have the opportunity to member check and the option of removing any information they shared from the transcription. Pre-, mid-, and post-surveys concerning efficacy, appraisal, and expectancy were administered online via Inquisite until 2011 when VCU changed the University-wide survey software to REDCap. At this time, surveys are administered and data collected from REDCap. The surveys are authenticated so that pre-, mid- and post-surveys can be matched to measure magnitude of change. The surveys include: (1) Appraisal Inventory: Participants are asked to rate how confident they are in their ability to accomplish certain teaching tasks. Respondents rate their degree of confidence anywhere between 0 (no confidence) to 100 (complete confidence). (2) Expectancy Inventory: Participants are asked to rate their degree of certainty that specific behaviors will lead to a specified outcome. Respondents rate their degree of certainty between 0 (completely uncertain) to 100 (complete certainty). (3) STEBI Form A: Participants are asked to indicate their agreement with a set of statements concerning their ability to teach science on a scale of 1-5, with 1 being Strongly Disagree and 5 being Strongly Agree. Our poster will outline the questions, methods, and statistics from the evaluation.
Title: Teacher Quality as a Retrospective Assessment of Program Quality  
NSF Noyce Award Number: 0832992  
Principal Investigator: Leah McCoy  
Institution: Wake Forest University  
Presenter(s): Caitlin Boone, Wake Forest University, foulce12@wfu.edu  
URL(s): http://scholarship.wfu.edu/education/WINS/  

We share results from our project evaluation, which has focused on assessments of teacher quality among Virginia Tech’s Noyce scholars who are in their first, second, and third years of professional teaching. Classroom observations and peer interviews indicate that these teachers are transforming their classrooms and schools, but that they face challenges associated with being new members of those schools. We use these results to reflect on and improve the quality of our mathematics education program.

Title: Reflective Action Research at Wake Forest University  
NSF Noyce Award Number: 0934693  
Principal Investigator: Jennifer Robertson Honecker  
Email: Jennifer.Robertson@wvu.edu  
Institution: West Virginia University  
Presenter(s): David Miller, WVU, millerd@math.wvu.edu  
URL(s): http://scholarships_and_awards/teach_wv/virginia_teach-home.html  

The Noyce TEACH-WV program supports students in two programs. Benedum Collaborative Five-year teacher education program recipients earn a physics, chemistry, biology, or math bachelor’s degree, as well as a master’s degree in education. Post-Baccalaureate Program in Secondary Science Education recipients are also eligible. As of May 2013, nine Scholars were teaching, six were graduating, and eight more were enrolled in their teacher training programs.

As part of their Noyce program, the TEACH-WV Scholars engage in a mentoring project with Noyce faculty in the STEM content departments in the Eberly College of Arts and Sciences and the STEM teacher training program in the College of Education and Human Services. The aims include to provide training and support for the Noyce Scholars and to enhance the vertical alignment between K12 and college STEM teaching. The potential pedagogical strategies include interdisciplinary teaching, enhancement of active learning, and other best practices. Scholars have engaged in a range of projects including collecting survey data to identify high school students’ readiness for college and their perceived barriers to college attendance; conducting literature reviews and collecting other information on interdisciplinary teaching strategies; designing and implementing “In the News” segments to demonstrate the relevance of math; partnering with a microbiologist to develop an active learning exercise with leeches; and implementing outreach activities with Upward Bound students. This poster will present an overview of these projects, share the Noyce TEACHWV Scholars and faculty perceptions about their participation, and discuss future evaluation and research plans.
Title: TeachWashington Noyce Teacher Scholarships Program

NSF Noyce Award Number: 0934785

Principal Investigator: Bruce E. Larson

Email: bruce.larson@wwu.edu

Institution: Western Washington University

Co-PI(s): Don Burgess, Western Washington University, don.burgess@wwu.edu

Presenter(s): Bruce Larson, Western Washington University, bruce.larson@wwu.edu

Don Burgess, Western Washington University, don.burgess@wwu.edu

TeachWashington Noyce Teacher Scholarships Program is contributing to a larger vision to permanently increase the number of secondary mathematics and science teachers prepared at Western Washington University (WWU) without sacrificing the proven quality of our graduates. We will award 61 Noyce Scholarships/Stipends to STEM majors in their junior and senior year and/or STEM graduates or professionals who are making a career change to become mathematics or science teachers.

To build demand for the scholarships, we focus on three activities: 1) Prepare and support Freshmen and Sophomores who have declared a STEM major to receive summer internships teaching mathematics and science at local school districts. After the internship, these students will be eligible to apply for Noyce Teacher Scholarships should they decide to pursue a teaching certificate; 2) Recruit junior and senior STEM undergraduates. On campus, we will clearly advise current STEM majors who have not declared a teaching interest. We will work with local community colleges to recruit graduates pursuing a STEM major and to identify candidates from under-represented groups. We will also work within our current recruitment efforts to identify future mathematics/science teachers who are facing financial obstacles that may prevent them from becoming teachers; 3) Recruit STEM professionals who are considering a career change or have been or may be laid off, to consider teaching. We will foster relationships with area companies’ human resources departments to attract professionals who have the interest and ability to become teachers.

Here are some program accomplishments. Twelve Noyce Summer Interns worked to improve K-12 students’ understanding of mathematics and science in the Bellingham, Mount Baker and Mount Vernon school districts during summer 2012. Nine interns completed the pre-survey in June 2012, prior to their summer internship, and all twelve completed the post-survey in October 2012 following their internship. Eight interns completed both a pre-survey and a post-survey. On the post-survey, seven out of the twelve interns stated that, as a result of their summer work with middle and high school students, they had changed their thinking about what is needed to help students learn math and science. The interns mostly wrote about the need to motivate students and engage them as learners. On the post survey, eight interns rated their summer internship as “excellent,” three rated their experience as “good,” and one responded “fair.” Prior to the summer experience, seven out of nine survey respondents reported that they were interested in teaching math or science as a career, and by the end of the summer, 10 out of the 12 were interested in a career in math or science teaching. Interns’ reasons for pursuing teaching careers stemmed from their desire to engage students in math and science.

We anticipate 15 summer interns for summer 2013. Interns meet with the PI Bruce Larson and co-PI George Nelson to prepare for the internship, keep journals on the experiences, and meet with the PI/co-PI afterwards to reflect on the experience. The following can be reported: 1) Participants in the summer internships during 2012 improved their understanding of teaching mathematics and science, and in their interest in becoming middle/high school mathematics teachers. 2) As of Spring 2012, we will have awarded 59 awards to WWU students who are pursuing certification as middle/high school mathematics and/or science teachers (grade 6-12). The awards total $590,000 of financial assistance; 3) Recruitment of STEM professionals who are considering a career change will be a focus in 2013-2014.

Title: The Winthrop Initiative for STEM Educators

NSF Noyce Award Number: 1035322

Principal Investigator: Beth Greene Costner

Email: costnerk@winthrop.edu

Institution: Winthrop University

Co-PI(s): Cassandra Bell, Winthrop University, belc@winthrop.edu

Kelly M. Costner, Winthrop University, costnerk@winthrop.edu

Lisa E. Johnson, Winthrop University, johnsonle@winthrop.edu

Presenter(s): Kelly Costner, Winthrop University, costnerk@winthrop.edu

Shannon Kissinger, Winthrop University, kissingers3@winthrop.edu

URL(s): www.birdnest.org/wise

The Winthrop Initiative for STEM Educators (WISE) is a Noyce Scholarship Project housed at Winthrop University in Rock Hill, SC, located in the north central region of the state. The University is a public, comprehensive institution with a long tradition of quality teacher education programs. The WISE program supports students in three different degree options: a traditional undergraduate teacher certification route, a two-year traditional Master of Arts in Teaching degree that primarily serves career changers, and a new fifth-year MAT option designed to serve recent graduates who choose to pursue teacher education immediately after completing an undergraduate degree in the discipline. In addition, the program sponsors a three-week summer internship for freshmen and sophomore STEM majors as a way to introduce
research possibilities in the discipline as well as a career in teaching. Our poster will feature (a) recruitment efforts, (b) data from the summer internships and scholar cohorts to date, and (c) future steps for the WISE program.

Title: Establishing a Community-engaged Noyce Scholar program
NSF Noyce Award Number: 1239995
Principal Investigator: Gary Lewandowski
Email: lewandow@cs.xu.edu
Institution: Xavier University
Co-PI(s): Dan McLoughlin, Xavier University, mcloughlin@xavier.edu
Presenter(s): Gary Lewandowski, Xavier University, lewandow@xavier.edu
URL(s): http://www.xavier.edu/noyce

Xavier University's Noyce Scholar Program explores the premise that community service-oriented STEM majors are more likely to be interested, and more successful, in teaching in high-need districts. Xavier University has a history of strong student volunteer contributions to the community. Our project uses a community engagement process to identify students that would not have otherwise pursued a teaching career. This process includes connecting an introductory education course to urban education; recruiting STEM majors to tutor in area schools; and creating a summer internship program that provides students with experience teaching STEM topics to underrepresented minorities from local K-12 schools. In our first year, we have established a community tutoring project, made initial revisions to the introductory education course that includes engaging students with key community agents, and worked with our community partners to design and award our first Noyce Summer internships. We have experienced both the unexpected challenges and opportunities that arise as community agencies have staffing turnover. While very early in the process, it appears the summer internship is succeeding as an attractor for STEM students to explore careers in teaching.

Title: Using Design Thinking in Mathematics Education as a Process for Emergent Mathematics teachers to Pose, Investigate, Design Prototypes and Develop Solutions to Pedagogical Challenges
NSF Noyce Award Number: 0934716
Principal Investigator: Leslie Keiler
Email: lkeiler@york.cuny.edu
Institution: York College, City University of New York
Presenter(s): Annabel D'Souza, York College, CUNY, adsouza@gc.cuny.edu
Vanessa Harrison, York College, CUNY, vanessa.harrison@yorkmail.cuny.edu
YongHong L. McDowell, York College, CUNY, yonghong.mc Dowell@yorkmail.cuny.edu

With Race To The Top and changes in teacher evaluations and curriculum (Common Core State Standards), students and their teachers are increasingly asked to perform under stressful and demanding conditions. As emerging teachers we need to find a way to balance the needs of satisfying testing requirements without sacrificing the “so what?” and “how does this count?” (as often asked by our students) component of teaching so that we can increase our students appreciation for mathematics. We utilized the Design Thinking For Education Toolkit to define our challenge problem: How do we create a guideline for incoming mathematics teachers?: Learning from the field before entering the field; collect and analyze data; research and brainstorm themes; and develop prototypes related to our inquiry question. As part of the process we interviewed several stakeholders that would directly benefit from a fresh perspective towards this challenge in mathematics education.
S/F 1
Title: Good Science Starts With Great Science Teachers
Presenter(s): Zachary Kovach, Current Noyce Scholar
Email: zachary_kovach@live.com
Institution: Arizona State University
Project Discipline: Physics

Think back to high school, junior high, even elementary school. Think about the names of the teachers you remember. Chances are you can name almost all of your former science teachers. The positive impact of these individuals has placed us where we are today—at the forefront of science education. As stated, good science starts with great science teachers. It is my belief that students’ impressions of science (both good and bad) form in the middle school years. This is why it is important to start recruiting a better group of teachers into the junior high setting that will not only instill a love of science in more students, but also in a more diverse group of students including minorities and females. It is also important to develop lessons that show real world science applicability and attention to children’s psychological state at this age. If science teachers can be a positive role model for more students by teaching at the junior high level as opposed to just high school physics for example, it is my belief that the United States will begin to grow economically and culturally by focusing on careers in the science, technology, innovation, and medical fields.

S/F 2
Title: Put Up Your Dukes! A Hands-On Lesson on Plant Defense—Creating STEM Teachers for Arkansas’ Future
Presenter(s): Kellie Freeman-Nelson, Current Noyce Scholar
Email: kellie.freemannelson@smail.astate.edu
Institution: Arkansas State University
Project Discipline: Biology

This project-based lesson plan, designed for high school biology classes, focuses on plant defenses. It incorporates Arkansas high school frameworks in areas of molecules, genetics, plant anatomy and ecology. Students are introduced to the importance of plants, plant predators and defense mechanisms through a brief PowerPoint presentation and class discussion. The students develop their own plant defense and express it by either drawing a picture or modeling a plant out of provided materials. The students then write a paragraph explaining how their plant defense works, what it was adapted against, and why they chose that defense. They can use one of the defenses they learned about or develop a new defense. This lesson is easy to modify for small to larger classes, and short to long class times. I found that student results varied in the defenses created. However, most of the students showed a strong leaning towards plant defenses that would completely annihilate their predators. Almost gleefully, students designed an arsenal of defenses, from squirting acid and spear-chucking sharp spines to having the flower smile so brightly that the predators are killed. Very few students used a defense merely to discourage predators.

S/F 3
Title: Noyce Scholars in the Community
Presenter(s): Stephanie Fonseca, Current Noyce Scholar
Email: slfonseca216@gmail.com
Institution: Cal Poly Pomona

The philosophy of Cal Poly Pomona (CPP) is learn by doing both inside and outside of the classroom. Through outreach events, CPP Noyce scholars involve the community and K-12 students in learning abstract concepts of mathematics and science. The STEM education activities CPP scholars have been involved range from outreach, community service, to after school programs. Some examples include: contributing to Covina Methodist Church education community, helping with Cortez Middle School science lessons at CPP, presenting at Collegewood elementary school “Fun with Science Day,” and Pre-Algebra, Algebra, Geometry Enrichment (PAGE) summer outreach program. On this poster, we will share our experience as future secondary math and science teachers with the Noyce community.

S/F 4
Title: Teachers Who Conduct Research and Their Ability to Apply their Experience to Lesson Plans
Presenter(s): Megan Ziegler, Current Noyce Scholar
Email: ziegler.megan@gmail.com
Institution: California Polytechnic State University in San Luis Obispo
Project Discipline: Interdisciplinary

The purpose of this study was to categorize lesson plans written by participants in a teacher-researcher program, and to quantify the way they integrated their research into a lesson plan. This was accomplished by creating coding rubrics using the Frameworks for the Next Generation Science Standards, and then coding each lesson plan according to this rubric. The lesson plans were then coded using common practices for research integration to quantify the ways that teachers implement techniques used in research into a lesson plan that students can then benefit from. Overall, teachers made at least one unique connection between their research and their lesson plan. This is an indication that teacher-researcher programs do help teachers to implement aspects of real science research into their classroom. Future research should focus on the connection between the teacher’s ability to make these unique connections and the role this may have on their ability to integrate inquiry as a method for student learning.

S/F 5
Title: Mammalian Biodiversity Survey and Population Dynamics and Naval Air Station Lemoore
Presenter(s): Vanessa Tucker, Teaching Fellow
Email: ness916@mail.fresnostate.edu
Institution: California State University
Project Discipline: Biology

The purpose of this study was to categorize lesson plans written by participants in a teacher-researcher program, and to quantify the way they integrated their research into a lesson plan. This was accomplished by creating coding rubrics using the Frameworks for the Next Generation Science Standards, and then coding each lesson plan according to this rubric. The lesson plans were then coded using common practices for research integration to quantify the ways that teachers implement techniques used in research into a lesson plan that students can then benefit from. Overall, teachers made at least one unique connection between their research and their lesson plan. This is an indication that teacher-researcher programs do help teachers to implement aspects of real science research into their classroom. Future research should focus on the connection between the teacher’s ability to make these unique connections and the role this may have on their ability to integrate inquiry as a method for student learning.
The goal of this study was to evaluate the population dynamics of small nocturnal mammals and the occurrence of medium to large mammals at Naval Air Station Lemoore in Lemoore, CA and a proposed conservation easement along the Kings River nearby. To assess small mammal activity, trapping grids were placed at three sites from June 2011 to May 2012, and mark-recapture methods were used to estimate populations. Baited camera traps were placed in those sites and at two additional sites, and digital images were used to assess medium to large mammal occurrence. Deer mice (Peromyscus maniculatus) were the most common small mammals captured. Western harvest mice (Reithrodontomys megalotis) and California voles (Microtus californicus) were also captured, but in numbers too small to make population estimates. Populations of deer mice were abundant at the beginning of the study, most likely due to the season and the previous year’s higher than average rainfall. They also experienced a significant decline during the colder months (Oct-Jan), which could be explained by the high metabolic cost of maintaining their core body temperatures. The camera traps were largely unproductive and captured a total of two target species (coyotes [Canis latrans] and red foxes [Vulpes vulpes]) in 1,665 h of trapping. It is recommended that further studies be done to assess the many complex conservation and management issues that still remain unevaluated.

S/F 6
Title: Project MT2: Co-Teachers to Colleagues, Two years of Collaboration and Reflecting
Presenter(s): Gilbert Hernandez, Teaching Fellow, gilmh20@csu.fullerton.edu
Marvin Soto, Master Teaching Fellow, marvin968@msn.com
Institution: California State University, Fullerton
School Name & District Currently Teaching: Los Alisos Middle School, Norwalk-La Mirada USD
Project Discipline: Math

Los Alisos Middle School is located in Norwalk, CA, a suburb just outside Los Angeles. Eighty-five percent of the student population at Los Alisos is Hispanic and the same percentage is eligible for free/reduced lunch. Our participation in the Noyce Project MT2 has had a tremendous benefit for students, a teaching fellow, and a master teacher.

1. Los Alisos Students: The first year of our Noyce partnership (Co-Teachers) allowed for better classroom management, increased small group/differentiated instruction, and lessons developed through collaboration. The second year of our Noyce partnership (Colleagues) benefits the students as we continue to support each other’s efforts to integrate technology and develop lessons focusing on the CCSS Standards for Mathematical Practice.

2. Teaching Fellow, Gilbert Hernandez: The first year was focused on co-planning and co-teaching lessons that addressed the needs of our students. Daily reflection on teaching with an experienced colleague and more formally through completion of the California Teacher Performance Assessment strengthened my ability to critically evaluate the impact of my teaching on student learning. The second year allowed for continued support and collaboration as colleagues teaching at the same school. This helped me develop ideas, push through barriers, and adjust instruction.

3. Master Teaching Fellow, Marvin Soto: The first year of Co-Teaching involved taking part in the National Board Certification process, which allowed for many opportunities for self-reflection. The second year of our Noyce partnership allowed for collaboration on planning units of study and lesson design. Our unique partnership also allowed for reflecting on lessons from two different perspectives.

S/F 7
Title: Comparative Fish Physiology Using Interactive MRI Images in an Informal Science Setting
Presenter(s): Beth Velasco, Current Noyce Scholar
Email: bvelasco0190@gmail.com
Institution: California State University, Fullerton
School Name & District Currently Teaching: Anaheim Union High School District
Project Discipline: Biology
URL(s): tap.fullerton.edu

The purpose of this study is to create an interactive fish ecomorphology exhibit for the Cabrillo Marine Aquarium in Los Angeles, using the University of California San Diego Digital Fish Library (DFL). Prior to exhibit development, a survey was completed to assess how the current exhibit space is used. It was discovered that the existing fish diversity exhibit was underutilized, because other adjacent exhibits attracted the Aquarium visitors’ attention. However, the survey results also showed that individuals who did stop at the fish diversity exhibit spent more time at that exhibit than at the other three in that space. It is predicted that the new ecomorphology exhibit, informed by scientific inquiry pedagogy, will increase the total amount of time spent by visitors learning about fish diversity. The exhibit will encourage active engagement and exploration by allowing users to visualize the internal organs of fishes of different shapes and to ask specific questions about fish shape and physiological ecology. Magnetic Resonance Imaging (MRI) data for local fish species, for which there are live specimens on display at the Aquarium, were obtained from the DFL. Segmentation software was then used to create color-coded, three-dimensional reconstructions of the internal organs of each fish. Key information about each fish species will be integrated into the exhibit and the accompanying educational materials to be developed. Aquarium visitors will be able to manipulate the images while comparing and contrasting the ecological and physiological characteristics of the different fish species. After the new exhibit is developed and tested, lesson plans that address the California Science Standards will be composed to serve teachers and students who visit the Aquarium on class field trips.
Globally competent students are able to adapt and contribute to a world that is rapidly evolving. A student-led conference provides students with opportunities to communicate to their families their perspectives about their learning. We will discuss the paradigm shift of the traditional teacher-led conference to the student-owned conference. This poster will guide educators to rethink that educational practice. We will provide step-by-step directions for educators to prepare their students to sit center stage to describe and defend their work, their knowledge, and their education. Together, let’s Turn the Tables, creating a platform where students own the conversation and communicate their ideas about their world of learning.

S/F 9
Title: The Faces/Facets of Blended Learning at USC Hybrid High School
Presenter(s): Stefnie Evans, Teaching Fellow
Email: sevans@uschybridhigh.org
Institution: California State University, Northridge
School Name & District Currently Teaching: USC Hybrid High School
Project Discipline: Math
URL(s): http://uschybridhigh.org/

USC Hybrid High is a brand new public school chartered by the Los Angeles Unified School District (LAUSD) and located in downtown Los Angeles. The school currently serves a diverse group of 130 9th-grade students, comprised of 64% Latinos, 28% African Americans, 4% Whites, and 5% Asians. Eighty-two percent of its students qualify for free or reduced-price lunch, and Spanish is the primary language spoken at home for 40% of the students. Dr. David Dwyer, the Katzman-Ernst Chair of Educational Entrepreneurship, Technology, and Innovation at the USC Rossier School of Education developed USC Hybrid High’s innovative, blended learning model, which was in response to schools that were failing so many students.

USC Hybrid High is built on 5 pillars: (1) personalized learning plans for each student; (2) an extended school day and school year; (3) technology for students and teachers to allow access to digital coursework, web content, and to use all kinds of media to communicate ideas; (4) school connectedness through a faculty-led advisory program; and (5) real world application projects, community service, and internships. USC Hybrid High’s mission is to graduate 100% of its students, the majority of whom come from low-income communities, and the school aims to socially and academically prepare each student for college and careers (the school motto is “College Prepared and Career Ready”). The poster will present the faces and facets of blended learning at USC Hybrid High School. Featured are students using the computer for electronic content and for developing presentations; students working on group projects; and students supporting each other in learning. Also, highlighted are other important aspects such as students participating during in-class activities, small group directed instruction, and student participation in real world application projects. Student work is also featured.

S/F 10
Title: Lesson Study and its Effects on Classroom Teaching
Presenter(s): Angel Moreno, Teaching Fellow
Email: angel.moreno@sbcusd.com
Institution: California State University, San Bernardino
School Name & District Currently Teaching: San Bernardino High School, San Bernardino City Unified School District
Project Discipline: Math

The CSUSB Noyce Teaching Fellows are secondary mathematics teachers teaching grades 7-12 in various districts who are enrolled in the CSUSB Master of Arts in Teaching Mathematics program while also participating in 10 full days of Lesson Study annually. Lesson study originated in Japan as a method for teachers to enhance their teaching by collaboratively studying, designing lessons, and observing student learning and analyzing students’ responses to the lesson. We have been engaging in lesson study since 2010 as Noyce Fellows (funded by NSF and our respective districts). It has been said that lesson study helps teachers “develop eyes to see students,” and we are experiencing this in our own work.

In this poster we demonstrate some of the highlights of our lesson study experiences. These include researching mathematical concepts, being able to collaboratively plan a lesson from beginning to end, and calibrating assessment pieces and agreeing on what would be considered a proficient answer. Most importantly, Lesson Study gives us a chance to focus on students and how they react to every component of the lesson. Our particular lesson study experience is designed so that we are able to teach the same concepts at different grade levels, strengthening our understanding of where our students are coming from and where they will be going. Lesson study has definitely affected our teaching in many ways. For some of us, it has matured our teaching abilities by being exposed to the experiences of our Master Teaching Fellows. For others it has helped bring in fresh perspectives from our Teaching Fellows, changing how we think about planning lessons and how we make decisions regarding the content and the pedagogy of our lessons.
S/F 11
Title: Using Word Walls to Improve Mathematics and Science Performance among English Language Learners in Washington State
Presenter(s): Kara Jo Thornton, Current Noyce Scholar
Email: SmitKara@cwu.edu
Institution: Central Washington University
Project Discipline: Math & Science

Historically in Washington State, English Language Learners (ELL) perform lower than their mainstream classmates. According to the Washington State Office of Superintendent of Public Instruction, in 2011-2012 59.2% of all 7th graders met the state standards in mathematics; however, only 18.1% of 7th grade ELL students met standard. In 7th grade science, 66.4% of students met state standards overall with only 14.4% of ELL students meeting standard. This trend repeats across all grade levels. Providing information organization techniques to second language learners should facilitate their academic language acquisition and ultimately their success on standardized tests. The effect of word walls on student utilization of academic language in middle school science and middle and high school mathematics will be evaluated. Word walls are posters showing a new word, its meaning, and a picture. Center for Excellence in Science and Math Education researchers from Central Washington University will conduct action research in three classrooms that have low state math and/or science test scores and a high percentage of ELL students. Research will be conducted in two phases. In Phase I, students will complete an instructional unit without being exposed to word walls. During Phase II students will be exposed to word walls. Data will be collected during each phase by administering pre- and post-assessments. Analysis of the Phase I pre-tests shows low understanding and low use of academic language for students in all three classrooms.

S/F 12
Title: Chemistry: Student Confidence and Engagement
Presenter(s): Natalie Robinson, Current Noyce Scholar
Email: natrb14@gmail.com
Institution: Chicago State University
Project Discipline: Chemistry

Engaging students in learning chemistry concepts can be challenging. Laboratories and class activities are helpful with increasing engagement in the activity. However, recent experiences at a Chicago Public High School, where most of the students struggle academically, revealed that increased engagement did not necessarily lead to improved comprehension of the concepts. Upon reflection, many of the students appeared frustrated or uncomfortable with the lack of step-by-step guidance and structure which often accompanies the laboratory and learning activities. Many students required constant assurance that they were implementing the activity correctly, and a few refused to move forward without complete reassurance from the teacher. Although many of the procedures to complete the activities were straightforward, such as weigh the 20 grams of each bean or count the number of beans, most students were not willing to move forward through the procedures without support from the teacher. The student’s confidence level in their ability to do chemistry seemed to negatively impact their comprehension of the chemistry concept. Although engaged in the activity, most students were unable to make appropriate connections between the activities and the chemistry concepts being studied. Building the self-confidence was (and continues to be) extremely important, for these struggling students, as well as engagement.

S/F 13
Title: Student Teaching Abroad: Being the ‘Guinea Pig’ in a Country that Eats Cuy
Presenter(s): Katherine Lodder, Current Noyce Scholar
Email: kate.educ@gmail.com
Institution: Columbus State University
Project Discipline: Education

For those daring souls, there are many times when being the guinea pig is exactly what is expected. It is rare that this opportunity arises in a country that actually eats guinea pigs, but this is exactly what was afforded to me as my university’s first student teacher abroad. In Ecuador, this delicacy is known as “cuy” and can regularly be found roasting over a spit on street corners. Through persistence, tenacity, and a wonderful support system, I made it to these street corners and tasted Ecuador. Join me in a poster discussion on new program possibilities with student and teacher involvement, focused in study abroad.

S/F 14
Title: Using Design Thinking in Mathematics Education as a Process for Emergent Mathematics Teachers to Pose, Investigate, and Design Prototypes and Develop Solutions to Pedagogical Challenges
Presenter(s): Vanessa Harrison, Current Noyce Scholar, vanessa.harrison@yorkmail.cuny.edu
YongHong McDowell, Current Noyce Scholar, yong-hong.mcdowell@yorkmail.cuny.edu
Institution: CUNY York College
Project Discipline: Math

With Race To The Top (RTTT) changes in teacher evaluations and curriculum (Common Core State Standards), students and their teachers are increasingly asked to perform under stressful and demanding conditions. With this shift towards new reforms, mathematics teachers in New York City face the challenge of narrowing the curriculum in order to prepare students for statewide exams and attempting to connect the mathematical ideas to real life and meaningful applications. As emerging teachers we need to find a way to balance the needs of satisfying testing requirements without sacrificing the “so what?” and “how does
this count” (as often asked by our students) component of teaching so that we can increase our students’ appreciation for mathematics. We utilized the Design Thinking For Education Toolkit to define our challenge problem: How do we create a guideline for incoming mathematics teachers?: Learning from the field before entering the field; collect and analyze data; research and brainstorm themes; and develop prototypes related to our inquiry question. As part of the process, we interviewed several stakeholders that would directly benefit from a fresh perspective towards this challenge in mathematics education.

S/F 15
Title: Dowling College Robert Noyce Scholarship Program Phase II
Presenter(s): Vincent Jacaruso, Current Noyce Scholar
Email: vxj2@dowling.edu
Institution: Dowling College
Project Discipline: Science and Math

The Robert Noyce Scholarship Phase II Program at Dowling College provides funding for 6 juniors and seniors and 12 career-changers to obtain mathematics and/or science teacher certifications and additional professional development. Every Noyce scholar is paired with both a Principal Investigator (PI) as faculty mentor, who directs academic and personal interventions and advises students in selecting professional development, and a Phase I scholar who also provides mentoring and career-planning advice. Post-graduate activities include an annual four-session Noyce Seminar course, guest speakers, and workshops. Continuing professional development is at the heart of the program, and a fund provides money for all scholars to engage in a variety of valuable experiences. The importance of integrating research and education is addressed by providing opportunities for scholars to gain research experience and serve as mentors to high school students conducting research. Initiatives include the Noyce Summer Professional Development Workshops, the Noyce Summer Research Institute, and the Noyce Science and Math Academy for high school students. Every year scholars have participated in Dino Digs with the Marmarth Research Foundation of North Dakota, and have contributed to discovery of new fossil species. Each year the PIs and scholars organize a Noyce High School Science and Math Symposium. Students present their research at a poster contest and attend math and science workshops led by experts in their fields. The 2013 Symposium was held on April 12 and was attended by approximately 250 high school students, teachers, and judges. Feedback provided by the teachers and students has been very positive.

S/F 16
Title: Duke University Master of Arts in Teaching Program
Presenter(s): Christopher Hewitt, Current Noyce Scholar
Email: smokeyhewitt@gmail.com
Institution: Duke University
School Name & District Currently Teaching: Durham Public Schools, Durham, North Carolina
Project Discipline: Science and Math

The Master of Arts in Teaching (MAT) Program at Duke University is an intensive, one-year program that provides highly-qualified teaching candidates with both a master’s degree and graduate-level teaching licensure. Over the past seven years, the Robert Noyce Fellowship has been an integral part of the Duke MAT Program, funding a total of 35 math and science teaching fellows. The Duke Noyce Scholarship Program recruits and prepares highly qualified STEM graduates and mid-career professionals to be leaders in the fields of math and science education and to teach in high-needs school districts. The MAT degree requires a total of thirty-six hours of graduate credit—15 hours in one’s academic discipline and 21 hours in education coursework. As a MAT graduate student, Noyce Fellows gain unparalleled teaching experience through a rigorous 27-week internship at two different high schools within Durham Public Schools. Over the duration of the program, Noyce Fellows develop into highly trained and reflective teachers who excel as leaders both within the classroom and in the teaching profession. Of the first four cohorts of Duke Noyce Fellows, over 70% continued to teach following their two-year minimum commitment.

S/F 17
Title: Elon University Noyce Scholars and the Elon Academy
Presenter(s): Jaime Morin, Current Noyce Scholar
Email: jmorin4@elon.edu
Institution: Elon University
Project Discipline: Math

Following the planned closure of a local high school due to failing test scores and low graduation rates, Elon University became actively involved in improving the local school district by creating the Elon Academy, a college access and success program. The students recruited for this program are believed to show academic promise, would be the first in the family to attend college and may demonstrate financial need. Additionally, the scholars who participate in the Academy may struggle to reach their full personal and academic potential in high school. The purpose of the Elon Academy is to increase graduation and college attendance rates of students in Alamance County schools. Currently, there are 68 high school scholars and 62 college scholars, a total of 130 students participating in the program. The participating students come from diverse family and racial backgrounds. These students must apply during their freshman year and are admitted for the remaining three years of high school. During their time in the program, each student attends three, four-week long summer sessions, Saturday programs during the academic year and is assigned a College Access Team (CAT) mentor. Each CAT mentor is a full time Elon University student, the majority of whom are working on secondary educational degrees in math, social studies and English. Nationally, only 70% of stu-
SCHOLAR/FELLOW POSTER ABSTRACTS

S/F 18
Title: Bridging Theory with Practice: Integrating the iPad® and TI Nspire into the Science and Mathematics Classrooms
Presenter(s): Trabille Cobb, Current Noyce Scholar, Trabille@yahoo.com
Naadiya Hopkins, Current Noyce, Scholar, nhopkins@broncos.uncsfu.edu
Institution: Fayetteville State University
Project Discipline: Biology/Math

The use of technology in the science and mathematics classroom is a crucial component of pedagogical strategies. The framework TPACK, which is technological, pedagogical, and content knowledge, is powerful when coordinated simultaneously in instruction. See how Fayetteville State University’s (FSU) Noyce Scholars applied this framework through the use of information and knowledge gained from various workshops and seminars to practical applications within the classroom. FSU’s Noyce Scholars have attended numerous events ranging from campus seminars to National and Regional Conferences. The Scholars have used information acquired during these events, specifically relating to the iPad® and TI Nspire, to facilitate learning within the science and mathematics classrooms through collaboration with their respective Noyce Mentors. FSU Scholars will share what worked and how obstacles were overcome.

S/F 19
Title: Analyzing the US Teenage Gun-Related Murder Rate
Presenter(s): David Turk, Current Noyce Scholar
Email: dlturk747@gmail.com
Institution: Kennesaw State University / Bagwell College of Education
School Name & District Currently Teaching: Student Teacher, Maynard H. Jackson High School, Atlanta Public Schools
Project Discipline: Math

The culture of today’s students requires that lessons be interactive, investigative, and relevant. In disadvantaged, urban high schools, violence towards, and from, students involving firearms is a harsh reality. Giving students the tools and information to confront such a problem is beneficial not only for their mathematical learning but also because it provides them a springboard to discuss and understand complex issues, as well as enact change in their communities. This lesson gives 9th grade students teenage gun-related murder rates from across the US and asks the students to use all the tools they learned in the data analysis unit for common core coordinate algebra. The lesson is culturally relevant and cognitively demanding. It helped increase the students’ motivation and interest in the task compared to a similar, state-created task; further, the lesson also caused some students to extend the task and further research the issue.

S/F 20
Title: Visualizing Math for My Students
Presenter(s): Janet Bean, Current Noyce Scholar
Email: JBean@lsdvi.org
Institution: Louisiana State
School Name & District Currently Teaching: Louisiana School for the Visually Impaired
Project Discipline: Math
URL(s): lsvi.org

Receiving the designation of Noyce Scholar has not only provided financial benefit, but also helped affirm my decision to change professions. As a high school student, I loved my math classes and sought an area of study that emphasized numbers and ideas as opposed to people and relationships (engineering). As my life changed, I found I valued working with people and enjoyed forming relationships, but still loved math. Becoming a secondary math teacher has let me have it all! During my teaching training, I had the opportunity to work with students in a community-based classroom. Working with those students further defined my direction. I realized I wanted to teach math to students in special education. While I wanted to work primarily with middle and high school students, I also wanted to have the opportunity to work with younger students. At the Louisiana School for the Visually Impaired (LSVI), I found my dream job. We are a K-12 school for students who are blind or visually impaired. I currently teach students in grades 7-12, but regularly interact with our elementary students as well. My classes are small (largest: 7 students), affording me the opportunity to work with each of my students. Because the majority of them stay on campus, I have the chance to get to know them in extra-curricular activities as well. Sometimes I feel like a combination parent/teacher to them. My own two children, both in their twenties, have visited my classes, getting to meet their “brothers” and “sisters.” Being a Noyce Scholar has helped me make the financial adjustment to a teacher’s salary. It paid for expenses not covered by the state for me to complete the graduate classes and testing necessary to obtain an add-on certification in Visual Impairment. It allowed me to travel to visit my
daughter when she was studying abroad where I spent a day at a high school for visually impaired students in the Czech Republic. It has given me the freedom to personally purchase teacher editions of textbooks and desired materials without having to wait for the often laborious purchasing process that is part of working for a state agency. In my final year as a Noyce scholar, I hope to complete coursework in elementary math education. While I am certified to teach grades 6-12, I find many of my students struggle with basic math. I hope to gain understanding of the math they missed in lower grades to better prepare them to move forward in their upper level math classes.

S/F 21
Title: Computational Study of Equilibrating Tautomers of Thiazole-, Oxazole-, Benzothiazole- and Benzoxazole-substituted Phenylethenoles
Presenter(s): Lauren Stutts, Current Noyce Scholar
Email: laurenstutts@gmail.com
Institution: Mississippi State University
Project Discipline: Chemistry

The stability of the tautomers of substituted phenylethenoles have recently become of interest. While few studies have been performed regarding these molecules, they have attracted attention because they serve as a starting point for several synthesis reactions. Each phenylethenole has been substituted with thiazole, oxazole, benzothiazole, or benzoxazole. The tautomers are in the enol, keto, and enaminone forms. Computational studies were completed in the gas phase using DFT and MP2 methods of calculation. Experimental studies were completed in DCCl3 solution phase using NMR. Computational and experimental data were then compared. Comparisons were made between Keq and ΔG values.

S/F 22
Title: Kenan Master Teaching Fellows: Linking Research Experiences and Curriculum Development with Leadership
Presenter(s): Alexander Constas, Master Teaching Fellow
Email: aconstas1@gmail.com
Institution: North Carolina State / Kenan Institute for Engineering, Technology & Science
School Name & District Currently Teaching: Shughart Middle School
Project Discipline: Biology

The goal of the Kenan Master Teaching Fellows program is to select, build and support a network of highly trained and influential master STEM teachers as part of a concerted effort among several high needs school districts, local institutions of higher education and regional community organizations. In-service Kenan Master Teaching Fellows (KMTFs) from high-need schools in the eleven-county BRAC/RTF region have completed two-year fellowships and have now transitioned into their role as “master teachers” in their districts. Kenan Master Teaching Fellows have and will continue to engage pre-service programs in partner institutions of higher education as well as their respective school districts in the BRAC-Region to help cultivate and better equip the next generation of educators.

S/F 23
Title: Architects ‘R Us
Presenter(s): Tara Connelly, Former Noyce Scholar
Email: thagen79@gmail.com
Institution: Pacific University
School Name & District Currently Teaching: McAuliffe Regional Charter Public School, Framingham, MA
Project Discipline: Math
URL(s): http://glendale.directrouter.com/~mcauliff/index.php

Working as a member of an architectural team in 2040, Geometry students are competing against other companies to win the contract to design a state-of-the-art Expeditionary Learning Middle School for the given site. They presented their proposed design to Henry Scollard, Design Team architect member of the Institute of Contemporary Arts building (http://www.bendheimwall.com/press/article_InstituteContempArt-Oculus.htm), who awarded the contract. Their design had several requirements including geometric restrictions, cost budgeting and team and time restraints.

S/F 24
Title: Rio Salado College’s Innovative Noyce Scholars Post Baccalaureate Teacher Preparation Program
Presenter(s): Thomas Hagen, Current Noyce Scholar
Email: thagen79@gmail.com
Institution: Rio Salado College
Project Discipline: Math
URL(s): www.riosalado.edu/noyce

A nationwide shortage of qualified math and science teachers has led to sustained local, state, and federal efforts to recruit and retain additional teachers in these areas. The Rio Salado College (RSC) Science and Math Innovative Learning Environments (SMILE) Program for Encore Careers in Education supports the recruitment and training of 40 STEM professionals to aid their transition into teaching careers in 7th-12th grade math and science classrooms in Arizona. Working with STEM-related industries in Arizona, Rio Salado College identifies STEM professionals who are interested in transitioning to teaching careers and assists them in meeting eligibility requirements and applying to the program. Successful applicants complete a comprehensive 15-month teacher certification program (based on the college’s Post-Baccalaureate Teacher Preparation Program) with online course instruction and onsite student teaching experiences in conveniently located school districts. RSC will also provide mentoring and professional support to SMILE participants as they fulfill the required teaching commitment in high-need schools. The pri-
mary goal of the SMILE program is to increase the number and quality of math and science teachers available to high-need schools in Arizona. During the first year of the program nine Post-Baccalaureate STEM Professionals including myself have been recruited and have begun the program. Receiving a stipend of $16,500 helped me cover tuition, books, fees, and some living expenses. The concept behind this program is an incredibly good one. Helping people who are in the math and science fields to make the transition into teaching, and getting them into high needs classrooms makes me excited that someone had a great idea that came to fruition. My poster will highlight the program’s first year’s scholars, district partnerships, and industry partnership. I have a wealth of experience to offer students because I bring real life application from my career in the U.S Army Corps of Engineers for 22 years, technical coordinator for a local school district in New York, and owning a business while serving as a volunteer fireman for 11 years. Teaching will afford me an incredible opportunity to touch the future of our country and to share my life skills and community involvement with my students. While instilling an excitement about learning math, I also hope to provide a role model for students to emulate and to help students become contributing citizens in our communities. I plan to finish my student teaching this spring, and finish my Master’s in Education prior to beginning my teaching career this fall.

S/F 25
Title: Using Action Research to Measure the Impact of Problem-Based Learning on Students’ Content Knowledge, Skills, and Attitude towards Light Pollution
Presenter(s): Chris Midden, Master Teaching Fellow
Email: cmidden@roe30.k12.il.us
Institution: Southern Illinois University Carbondale
School Name & District Currently Teaching: Unity Point School District 140
Project Discipline: Science and Math Education

Research studies have reported the impact of Problem-Based Learning (PBL) approach on students’ science content knowledge and skills. However, there is a dearth of research on the use of Action Research (AR) as a framework for measuring the impact of PBL on students’ science learning. In this study, an Action Research was conducted on Light Pollution unit that was taught using PBL approach in one middle school science classroom. 27 students received instruction on Light Pollution through the PBL approach for a period of 5 days.

Three research questions guided this study: To what extent does PBL approach increase students’ knowledge about Light Pollution? To what extent does PBL on Light Pollution increase students’ scientific skills? To what extent does PBL on Light Pollution increase students’ attitude towards science? Results show significant differences between the pre- and post-tests on students’ content knowledge and scientific skills. However, results show that students maintained their positive attitude towards science. Qualitative results also suggest that PBL had little impact on enhancing students’ skills for asking and answering scientific questions. Based on these results and those in previous studies, it is evident that PBL has the potential to enhance students’ science content knowledge and scientific skills.

This study also suggests that Action Research is a potential framework for measuring the impact of PBL on student learning. These findings have implications on science teaching and learning, and teacher professional development.

S/F 26
Title: Weaving Together the Threads of Education
Presenter(s): Peyton Cox, Noyce Fellow
Email: PeytonCox@live.com
Institution: Stephen F. Austin State University
Project Discipline: Science

This poster of the Talented Teachers in Training for Texas (T4) program focuses on the intrinsic benefits of the organization, namely the building and development of a community of pre-STEM Educators. The theme of “Weaving Together the Threads of Education” will be highlighted by illustrating how every T4, or thread, comes together through the various programs that T4 offers. These programs will serve as the focus points through which the threads begin to interact. The interlocking of these threads symbolizes the weaving together of individuals into a fellowship—the educational tapestry. The focus points will start at pre-scholarship programs, particularly a NASA Teaching Experience and Teacher Job Shadow. These programs help to give individuals a foot in the door to an identity as a part of the educational community. Many T4 scholars participated in at least one of the opportunities even before stepping into the T4 Scholar community. After these activities, the threads will begin to overlap more regularly showing how, through our shared experiences, we grow closer as a community. Ultimately the threads will come together into a cloth, showing how the T4 program acts as a needle, knitting individual aspiring teachers into a greater whole and preparing them not just for an individual career but ushering them into a role in the educational community at large. Since isolation in the classroom often leads to teacher attrition, this program is developing teachers who not only contribute to the educational community but are much more likely to remain teachers for life. As the idiom states: united we state, divided we fall.

S/F 27
Title: Texas Leadership Initiative: Mathematics Instruction Transformed (Texas LIMIT)
Presenter(s): Penny Long, Master Teaching Fellow
Email: plong@nacisd.org
Institution: Stephen F. Austin State University
School Name & District Currently Teaching: Nacogdoches High School, Nacogdoches Independent School District

This poster project was created to share what has been done in the leadership initiative for mathematics teaching and learning. The TLI was a grant program that focused on providing professional development for mathematics teachers in schools that were identified as needing the most help. The focus was on developing leadership in those schools and providing professional development that would help those teachers become the leaders in their schools. The program was focused on three things: content knowledge, pedagogy, and leadership. The content knowledge and pedagogy focused on the National Council of Teachers of Mathematics (NCTM) Principles and Standards for School Mathematics and was delivered in a three-day workshop format. The leadership component was delivered in a one-day workshop format.

The goal of the project was to increase the number of mathematics teachers who were knowledgeable about the NCTM Standards and who could effectively teach mathematics using the NCTM Standards. The project was successful in meeting this goal by providing professional development to mathematics teachers who were knowledgeable about the NCTM Standards and who could effectively teach mathematics using the NCTM Standards. The project was also successful in increasing the number of mathematics teachers who were knowledgeable about the NCTM Standards and who could effectively teach mathematics using the NCTM Standards.
Master Teaching Fellows (MTFs) in the Texas Leadership Initiative: Mathematics Instruction Transformed (Texas LIMIT) project are being trained in the design and delivery of professional development in mathematics. MTFs are experiencing the process of identifying needs in their districts, researching solutions, and designing professional development strategies. In addition, MTFs are working with school administrators to plan implementation. Completed modules will be reviewed and made available to all Texas LIMIT MTFs.

**S/F 28**

**Title:** Plugging Teachers into Classroom Technology: A Collaborative Project of Noyce and STEM Academy Scholars  
**Presenter(s):** Nolan DeMent, Current Noyce Scholar  
**Email:** ndement13@neo.tamu.edu  
**Institution:** Texas A&M University  
**Project Discipline:** Math

AggieTEACH is a pre-service, undergraduate program at Texas A&M University that permits students majoring in a math or science related field to concurrently obtain a state issued secondary teaching certificate. This unique partnership consists of faculty members from both the College of Education and the College of Science, equipping students with an enriched and professional experience. The program’s focus is to produce highly qualified teachers in response to the national and state wide shortages in STEM subjects. Several of Texas A&M’s Noyce Scholars are members of the newly founded, STEM Academy, a program geared toward integrating technology in science and mathematics classrooms. Student participants in the STEM Academy are partnered with a local teacher in their related subject. Throughout the course of the semester, students attend the learning academy seminars where they learn about various technologies and strategies to implement them. These skills are then translated into the classroom where STEM Academy participants can receive professional and pedagogical feedback.

The STEM Academy began in June 2011 with 43 scholars and 22 mentors. The Colleges of Science and Education were awarded a Math, Science, and Technology Teacher Preparation Academy grant from the Texas Higher Education Coordinating Board. This grant provides funding for a STEM Teacher Preparation Academy focused on increasing the quantity and quality of mathematics and science teachers certified at the middle school and secondary levels by implementing a high quality, rigorous curriculum that uses cutting-edge technology, focuses on STEM content, and creates a community where in-service and pre-service teachers work in unison to grow academically and professionally. Through these funds, the program continued to explore various educational technologies including motion sensors, probes, iPads, and Camtasia video editing software.

The program began by introducing the basic functions of SMART technologies, including SMART Board and SMART Notebook. After learning about the many uses of iPads in the classroom, scholars and mentors began creating video lessons using Camtasia and SMART Notebook. The Academy concluded with a focus on professional development that included classroom management, social media and questioning techniques. Since its inception into AggieTEACH, the program has experienced significant growth in size and quality, providing invaluable professional experiences for pre-service teachers. Noyce scholars continue to implement skills and techniques acquired through these programs into local and state-level instructional technology-based projects.

**S/F 29**

**Title:** Noyce Scholars in the Community  
**Presenter(s):** Shelbey Salazar, Current Noyce Scholar  
**Email:** shelbey.salazar@ttu.edu  
**Institution:** Texas Tech University  
**Project Discipline:** Math  
**URLs:** www.depts.ttu.edu/stem/noyce.php

The poster showcases the effects that Noyce scholars have on the local K-12 community. A part of the Noyce program’s vision is to create competent teachers that can become great resources for schools. Community involvement is a major aspect that is encouraged throughout the entire program. Scholars in the undergraduate phase of the program are already beginning to make a difference in communities during their summer K-12 outreach experiences. Tex-Prep, Science—it’s A Girl Thing, and focused tutoring are just some of the examples of Noyce scholars in action. These programs not only encourage children to explore the areas of math and science, but allow for scholars to refine their skills. This experience, coupled with the Noyce coursework and seminars, will allow scholars to substantially improve the teaching of math and science at local high needs schools. In conclusion, Noyce scholars are not only developing into great teachers but have the resources to be positive community activists.

**S/F 30**

**Title:** Seeing the Hexagon: Exploring Visual Geometries  
**Presenter(s):** Jorge Flores Gamboa, Current Noyce Scholar  
**Email:** jorge92flores@berkeley.edu  
**Institution:** University of California, Berkeley  
**Project Discipline:** Math

Some of the most rich and interesting educational experiences can come from prior elementary knowledge; in fact, an educational activity that demands a student to be able to use all the knowledge in her or his mathematics arsenal is the very kind that promotes higher understanding, pushing the student’s knowledge into near mastery. I challenged a group of high school Precalculus students to find the shape (a hexagon)
created by rotating a cube filled with water on one of its corners and looking at the cube from the top down. This type of spatial visualization question invited students to step away from the curriculum of only homework and testing and to think in a different fashion about math. The students ended up presenting their assumptions and possible answers to the question with fierce diligence to find the answer. Certainly by the end of the lesson, the students had engaged their creativity and outlook towards math in ways they had never thought they would.

S/F 31
Title: Performance-based Assessment of UCSB Noyce Teacher Candidates
Presenter(s): Cody Foster, Current Noyce Scholar
Email: codycfoster@gmail.com
Institution: University of California, Santa Barbara
School Name & District Currently Teaching: Santa Barbara Unified School District
Project Discipline: Biology

The Teacher Education Program at the University of California Santa Barbara has used PACT, one of several state performance-based assessments, to determine if the teacher candidates are prepared to enter their own classrooms. This year we are field testing a national performance-based assessment, edTPA. Our poster will contain insights from our experience, including that of one of our Noyce Scholars.

S/F 32
Title: Methods to Support English Learners in Math and Science Classes.
Presenter(s): Jennie Martella, Current Noyce Scholar and Mariah Vega, Current Noyce Scholar
Email: jennie.m.martella@gmail.com
Institution: University of California, Santa Cruz
School Name & District Currently Teaching: Shoreline Middle School, Live Oak Elementary School District / Watsonville High School, Pajaro Valley Unified School District
Project Discipline: Biology and Math

In the 2010-2011 school year, California’s public schools served 1.4 million English Language Learners, which is roughly 23 percent of the entire public school population. On top of this, an additional 14 percent of students speak a language other than English at home. These students are divided into 52 different language groups, the most prevalent of which is Spanish. As a result of this language diversity, it is important for California school teachers to structure their curriculum to support the language acquisition needs of this high proportion of students. In math and science particularly, this support is of utmost importance because both fields of study have many content-specific vocabulary terms on top of the always present academic vocabulary. In this poster, we will share how we structure our lessons to fit these needs at both the middle school and high school level. Guidelines presented by Pauline Gibbons, Jeff Zwiers, and Judit Moschkovich have provided the most influence on our teaching practices. These guidelines stress the importance of recursive teaching, classroom dialogue, visual modeling and multiple representations, and additional strategies.

S/F 33
Title: Technology in the Classroom: Implications for Student Attitudes About Learning Science
Presenter(s): Brooke Wittleder, Current Noyce Scholar
Email: brooke.wittleder@colorado.edu
Institution: University of Colorado at Boulder
Project Discipline: Geosciences, Biology, & Chemistry

Technology has become an essential tool in the science classroom, not only in regard to its ability to enhance lesson content but also in regard to its potential to engage students in learning. In this study, a team of veteran, novice, and prospective secondary science teachers explored the role of simulations and computers across different disciplines of science and their influence on student attitudes toward learning science. Specifically, the study was designed to address this research question: Do student attitudes towards learning earth science, chemistry, or biology change with the use of PhET simulations? In each science discipline, one class of students completed a lesson using interactive, University of Colorado research-based PhET simulations while another class completed the same lesson without the use of these simulations. After finishing the lessons, students completed a short survey about their attitudes towards learning science that included both scaled and open-ended responses. We found that the majority of students in the study agreed or strongly agreed with the statement “I enjoy working on computers to complete activities in science class,” indicating that one role of technology in the classroom may be to increase student motivation when learning. Additional results and implications for teaching will also be presented. This research is a part a pilot study conducted through CU-Boulder’s new Teaching to Learn project.

S/F 34
Title: Teaching to Learn: Using iPads to Transform Physics Students’ Roles
Presenter(s): Susan Nicholson-Dykstra, Master Teaching Fellow
Email: Susie.dykstra@gmail.com
Institution: University of Colorado at Boulder
School Name & District Currently Teaching: Northglenn High School, Adams 12 Five Star Schools
Project Discipline: Physics
URL(s): Northglennhs.org /Adams12.org

With the explosion of tablet technology and e-Resources available to students who are digital natives, it is vital that teachers develop strategies for purposefully incorporating these resources into the learning experience. In this study, iPads were
SCHOLAR/FELLOW POSTER ABSTRACTS

utilized as tools for students to teach, create, synthesize and apply ideas in a physics classroom. This research investigated the impact of a 1:1 iPad environment on student achievement, engagement, agency, and attitude toward science in an urban science classroom. Students who utilized iPads to create teaching tools, such as screencasts, animations and other digital models, report an increased sense of pride in their product and confidence in their understanding of the content material. Ongoing investigations are being conducted to determine whether student achievement is consistent with student perception of content mastery. The project was partially funded by NSF grant DUE 934921 and Northglenn High School, Adams 12 Five Star Schools.

S/F 35
Title: Illustrative Mathematics
Presenter(s): Evyn Hackett, Current Noyce Scholar, evyn.hackett@ucdenver.edu
Robyn Kinney, Current Noyce Scholar, robyn.kinney@ucdenver.edu
Institution: University of Colorado, Denver
Project Discipline: Math

As part of a one-credit hour readings course, the mathematics scholars in the Rocky Mountain Noyce Scholars Program participated in a pilot project known as the Pre-Service Teacher Task Study Project. Along with preservice teachers from four other universities, we gained experience (a) working through tasks from the Illustrative Mathematics Project related to the Common Core State Standards with respect to geometry, (b) critiquing tasks written by others, and (c) writing tasks and responding to feedback given by others. As such, we were introduced to the Illustrative Mathematics professional community of educators. In this poster, we provide details of the pilot program, sample tasks we wrote, and share our thoughts on this learning experience.

S/F 36
Title: Building a Community of Math and Science Scholars
Presenter(s): Eileen Yakish, Current Noyce Scholar
Email: eileen.yakish@ucdenver.edu
Institution: University of Colorado, Denver
Project Discipline: Biology, Chemistry, Environmental Science, Physics
URL(s): clas.ucdenver.edu/PULSE_Noyce

The Robert Noyce Teacher Scholarship Program supports two scholarship track programs at the University of Colorado Denver. The goals of both programs are to recruit and prepare students for secondary science teaching careers in settings that have the greatest need for excellent teachers. Whereas the Rocky Mountain Noyce Scholars Program supports undergraduate and post baccalaureate students in mathematics, the P.U.L.S.E. Noyce Scholars Program supports undergraduate and post-baccalaureate students in the sciences, including biology, chemistry, environmental sciences, and physics.

As part of the learning progression for Noyce Scholars, we attend a biweekly seminar series that is also attended by the principal and co-principal investigators on both grants, as well as one of our Noyce mentors—a master teacher with a STEM background and strong professional roots in the Aurora Public Schools, our partner school system. These meetings are often attended by the external evaluator for both projects as well. As a result of our seminars, we have explored a variety of topics including: equity vs. equality, transforming the classroom, English language learners, teaching controversial topics, induction into teaching. Through these informal meetings, the two Noyce Scholars Programs have built a community of teaching scholars. Seminar structure, topics, activities, and outcomes will be discussed.

S/F 37
Title: Modeling the Growth of the Kukui Nut Tree: Place-based Math in a Hawaiian Context
Presenter(s): Virgilio Viernes, Current Noyce Scholar
Email: vvj@hawaii.edu
Institution: University of Hawaii at Hilo
Project Discipline: Math

The Hawaii Noyce Teacher Scholarship (HiNTS) program presented “Math Day 2013: The Amazing Race,” which included 4 math activities in the context of various cultures throughout the globe. In constructing these activities, the HiNTS scholars emphasized place-based mathematics. Particularly, students participating in the activity “Of pH and Plants” discussed the relationship between the pH level of soil and the plant growth of the kukui nut tree—a plant that plays a significant role in native Hawaiian culture. Using TI-84 calculators and pH probeware, students collected data, modeled math, and explored concepts like correlation and best-fit curves. Through this activity (along with the other activities of Math Day 2013), students saw the intimate connections among place, culture, and mathematics.

S/F 38
Title: Engaging High School Students in Geometry: Houston Cone-icles
Presenter(s): Gloria Carrillo, Current Noyce Scholar
Email: gloria.carrillo19@yahoo.com
Institution: University of Houston
Project Discipline: Math

This poster will showcase how a Noyce Scholar at the University of Houston was able to engage area high school students in a geometry lesson over the surface area of cones. This 5E lesson engages students through introducing the concept of surface area through gift wrapping ideas. Students explored making different cones when given pre-cut circles and assigned arc lengths. This culminated in their deriving a formula for the surface area of a cone. The students presented their cones and findings to the class as well as their formulas. This early teaching
experience in a high school mathematics class was integral in the pre-service teacher preparation.

S/F 39
Title: Teaching Quantum Mechanical Properties in the High School Setting
Presenter(s): Geoffrey Hart, Current Noyce Scholar
Email: ghart2012@gmail.com
Institution: University of Houston
Project Discipline: Physics

Physics in the high school setting tends to focus on the Newtonian physics, originating 300 years ago. With modern knowledge growing at an exponential rate, the high school curriculum has begun to incorporate new content. The Texas Essential Knowledge and Skills (TEKS) has, for the first time, incorporated the Photoelectric Effect into its curriculum. This poster include statistical results of first-time implementation of this content through an inductive, student-driven lesson and concludes that the content is suitable for a high-school learning environment.

S/F 40
Title: Traditional Mathematics Instructions versus Technology: A Comparison of Integrating Two Methods of Teaching in Geometry
Presenter(s): Ilian Rojas, Current Noyce Scholar
Email: yes_irojas@yahoo.com
Institution: University of Houston-Downtown
Project Discipline: Math

The purpose of this research is to integrate digital technology into secondary mathematical classrooms. The software that will be used is called Geometer’s Sketchpad (GSP). This software can be used for different levels of mathematics such as Geometry, Algebra, and Pre-Calculus. A control group and experimental group of students will take a pre-test, followed by a lesson and post-test. The pre-test will cover certain topics previously mentioned. During the lessons, they will a have a set of activities. Then they will continue with a post-test that consists of the material they have covered. Two different methods of teaching this material will be utilized; the Geometry Standards in the CCSS (Common Core State Standards) and the Van Hiele’s Model for Geometry. The Geometry Standards in the CCSS will be taught through the traditional method. On the other hand, the Van Hiele’s Model for learning Geometry will be using the GSP software. By comparing the traditional method vs. software package method the results of the study should reveal that by the students operating the software it will help them have a better understanding of the material and have a positive feedback about activities. In addition, a questionnaire will be given for both methods in order to determine and state which method the students prefer. Lastly, a survey for college students who are declared in Applied Mathematics will be conducted to view if they have ever used technology in secondary educational classrooms. This data will be used to obtain their opinions regarding if technology would had been useful to these students in the secondary level of education.

S/F 41
Title: A Comparison Between a Wetland Mitigation Bank and a Natural Wetland using Shannon’s Index
Presenter(s): Angela Rosales, Current Noyce Scholar
Email: arosarosales@aim.com
Institution: University of Houston-Downtown
Project Discipline: Biology

Diatoms can be used to measure succession in a mitigation wetland community. Previous research compared Greens Bayou Wetlands Mitigation Bank (GBWMB), a man-made wetland, and Anahuac National Wildlife Refuge (ANWR), a natural wetland, using the total Diatom count and the number of genera present as indicators. Shannon’s Index was one measure of comparison used, but the value of the Shannon Index was reduced by the lack of counts from multiple samples for each site in the comparisons. In this study, we investigated the impact of multiple samples on the value of the Shannon Index as a measure of progress of how GBWMB has become similar to ANWR. Shannon index is an index that can be used to identify genera diversity in a community. Shannon’s Index accounts for both abundance and evenness of the genera present in both locations. In this study, 0.1g samples were used to generate data for Shannon’s Index calculations. The expectation is that these values will give a truer signal for the comparison of the GBWMB to the ANWR.

S/F 42
Title: Lava Lamps: Turning Up The Heat
Presenter(s): Meredith Herdter, Teaching Fellow
Email: mpherdter@gmail.com
Institution: University of Massachusetts Amherst
School Name & District Currently Teaching: Greenfield High School 8th Grade Academy
Project Discipline: Middle School Science

We all want ways to connect the different worlds of science, but finding the inspiration to build a connection seems to be the most difficult. So we need to do what scientists do best, make observations and we will find many things to inspire young people to think deeper into the world of science. Observing different phenomena is what led me to using a lava lamp to make a connection between the ways heat transfers and plate tectonics. Lava lamps are that lost toy that most of us had when we were younger but were sold at the summer garage sale or donated to the thrift store. Many of our students have no idea what a lava lamp is, especially those who are not originally from the United States, but they are a beautiful thing when it comes to discussing heat transfer. For this poster I would like to share my plan of using inquiry and lava lamps as a way to introduce heat energy and plate tectonics. Heat transfer in the form of conduction,
convection, and radiation, along with plate tectonics, are all part of the Massachusetts Science Education Framework and what a magnificent thing to connect them all. When students are interested by a toy or, in this case, new phenomenon, they tend to be more engaged in the lesson and the topics being covered. That is exactly what I found when I brought in a lava lamp from my childhood and let students make observations. I then brought in a few materials from CVS and let students explore with the different substances and make statements regarding density, volume, and temperature. They were able to build their own lava lamps and were able to see how heat moves. The students were very interested to try different things and see what happens when certain variables were changed; this led to conduction, convection and radiation, which ultimately led to plate tectonics. We discussed methods by which the earth was made and how the plates actually move. This was a discussion led by the students, where they came to their own conclusions that heat was the overall factor that drives the earth's systems. Simple things can lead to very inspiring moments for students. Allowing them to get their hands dirty allows for some engineering and problem solving. All of these things need to be covered within one year in Massachusetts and using inquiry and lava lamps led our students to a world of discovery and exploration in the science classroom.

S/F 43
Title: Project-Based Learning: Flipping the Classroom to Teach Anatomy and Physiology
Presenter(s): Eric Hayes, Former Noyce Scholar
Email: ehayes@ashland.k12.mo.us
Institution: University of Missouri
School Name & District Currently Teaching: Southern Boone
High School, Southern Boone School District
Project Discipline: Anatomy and Physiology
URL(s): http://ashland.k12.mo.us

This project describes the technique of using case studies, interactive animations, and student presentations to teach anatomical concepts at the high school level. When given the opportunity to explore diseases associated with the human body, students become more engaged in their learning and are able to recall the information on assessments. This particular investigation takes place during the urinary system unit where students are assigned a case study and must identify the causes, symptoms, tests, treatments, and prognoses of a urinary disease. After diagnosing the case, students create a visual representation of their disease to present to the class using a variety of mediums including posters, models, and animations. By flipping the classroom and allowing project-based learning, the students begin to take responsibility for their learning while teachers can remain an active guide.

S/F 44
Title: UNCG's Project ExSEL Examines the Efficacy of Service Learning for Pre-Service Science Education
Presenter(s): Chelsea Joyce, Current Noyce Scholar
Email: cnjoyce3@uncg.edu
Institution: University of North Carolina, Greensboro
Project Discipline: Science

Project ExSEL, the Robert Noyce Teacher Scholarship Program at UNCG, requires that interns and scholars do service learning in the area of science and science education, either in the summer or during the semesters of receiving the stipends or scholarships. The efficacy of this requirement is being studied with surveys from the past and current recipients of the stipends/scholarships to assess the value and importance to pre-service science teacher preparation. In addition, the type of service learning; the amount of time or number of hours; the type of supervision; the type of research; the target audience; and methods of reflecting on the experiences will be presented. One pre-service teacher’s experience will be offered by a scholar who has chosen to work at the Greensboro Science Center in a variety of capacities, teaching all ages about the animals and habitats at the center. She will reflect on the experience as a component of ExSEL and pre-service teacher training.

S/F 45
Title: Science Research Techniques Curriculum Development
Presenter(s): Jill Crookshanks, Former Noyce Scholar
Email: jillcrookshanks@yahoo.com
Institution: University of Northern Colorado
School Name & District Currently Teaching: Northridge High School
Project Discipline: Biology

Curriculum development is the most important component of today’s education system. This is due to the fact that the teacher decides what are the most important parts of any subject and determines what are the most significant and essential curriculum materials that learners receive. This is why collaboration with other teachers and constructive criticism are essential when developing new curriculum. When developing the curriculum for the Science Research Techniques (SRT) class at Northridge High School in Greeley, CO, collaboration with the STEM Magnet coordinator and the science and math curriculum administrator was crucial to develop and have a clear sense of what the students should leave this class knowing. The SRT class is required in order for students to graduate with a STEM Magnet endorsement and even though it had been taught in the past, there was no set curriculum established. The STEM Magnet coordinator, administrator, and I met several times to determine what would be an appropriate and rigorous enough curriculum to teach our students, and more importantly, what sort of knowledge and skills we wanted our STEM endorsed students to leave Northridge High School knowing. It was determined that
the main focus of this class was to teach our future science and math leaders to be able to write scientific papers with the correct APA formatting before leaving high school. This will give the STEM endorsed students an advantage when taking their first science class in college. Two formal lab reports and a final completed STEM Magnet project with a final lab report are now requirements of the SRT class to receive a passing grade. Practicing these writing skills using APA format and practicing how to use Excel to create college level graphs will be an essential knowledge base to have when entering the science or math field in college. The presentation will compare the past SRT curriculum with the current one and determine the quantity and quality of completed STEM projects. Also, students' attitudes survey results from the current and previous course will be shared and compared.

S/F 46
Title: PR Master Math Teacher Program
Presenter(s): Yamily Colon, Teaching Fellow
Email: yamilycolon@hotmail.com
Institution: University of Puerto Rico at Rio Piedras
School Name & District Currently Teaching: School: Ramon Power Giralt / District: San Juan
Project Discipline: Math
URL(s): http://alacima.uprrp.edu/MMT

The Puerto Rico Master Math Teacher Program will certify ten 7-12 grade mathematics teachers who teach in high-need school districts, as Master Math Teachers (MMT) through the University of Puerto Rico Rio Piedras Campus Division of Continuing Education. The intensive professional development program includes inductive and deductive reasoning, mathematical models: linear, quadratic and exponential, and the integration of math education and research. The experience as a MMT fellow includes professional development to other teachers, designing activities and performing action research; thus preparing the MMT to design, modify and transfer activities to the classroom and perform action research to improve student's understanding of math concepts.

S/F 47
Title: Conceptual Change through Scientific Inquiry: Floating and Sinking in Fresh and Salt Water
Presenter(s): Arlyn Kilduff, Current Noyce Scholar
Email: arlynkilduff@gmail.com
Institution: University of South Florida
Project Discipline: Biology

The conceptual change model allows students to become aware of their preconceptions of scientific knowledge and ultimately resolve and accommodate correct information on the subject. This model can be used for a wide variety of ages starting in primary school through higher education. Conceptual change occurs through a series of consecutive steps. One method of employing these steps is to have students engage in scientific inquiry. An example of conceptual change through scientific inquiry can be shown by teaching density. Density is a difficult concept for students to understand, especially how it relates to water. First, students must become aware of their knowledge by thinking about a concept and making predictions. Allowing students to work with fresh and salt water and see how objects react differently will force students to use their prior knowledge, justify their reasoning and commit to that outcome. Second, students share those outcomes either with the class or a smaller group of students. Third, students test their predictions through an inquiry activity. Students will experiment on the two types of water by placing various objects in the water and making observations. Through this testing the results will lead students to conclude that salt water has a greater density and that density affects how objects float in water. Fourth, students will work to resolve any conflicts created by the activity. Through students' observations during the activity, they will accommodate these new experiences into their existing framework of the concept of density and water. Finally, the students will use the new knowledge to create connections between scientific concepts and further increase their scientific knowledge. For example, students' new knowledge on density could be applied to buoyancy and its implications on boat design. This activity will give students a concrete representation of density and its effects on water. Through this process of scientific inquiry, students will have a better understanding of the natural world and how scientists investigate natural phenomena.

S/F 48
Title: A Project-Based Instruction Unit in Mathematics
Presenter(s): Christina Mullinax, Current Noyce Scholar
Email: wvf844@mocs.utc.edu
Institution: University of Tennessee at Chattanooga
Project Discipline: Math

Project-based instruction is widely discussed in education circles as an engaging method of instruction that creates new pathways of learning. Projects involve issues and problems that the students can address through the study of their subject and for which they will eventually find their own solutions. Finances are an issue that is often discussed and constantly in the news, but few students have an understanding of the mathematics involved in decisions such as which car they should buy, how they should use their credit cards, and other money-related matters. This seventeen-day unit contains two projects: an individual portfolio and a group business presentation. In addition, there are a variety of other teaching strategies including cooperative learning, inquiry-based instruction, role-playing, and case studies. The learning outcomes include students gaining an understanding of the financial and economic-related mathematics, but also understanding the terms and processes that they will go through when they make decisions relating to purchasing houses and utilizing credit cards.
**S/F 49**  
**Title:** Investigating the Implementation of Numeracy Strategies in the High School Classroom and Its Effect on Students’ Number Sense  
**Presenter(s):** Abigail Delvaux, Teaching Fellow  
**Email:** adelvaux@utk.edu  
**Institution:** University of Tennessee Knoxville  
**School Name & District Currently Teaching:** Central High School, Knox County School District  
**Project Discipline:** Math  

In a quasi-experimental project, numeracy strategies were implemented two times a week for five weeks in two ninth grade Algebra I classes to determine if the students’ number sense would improve as well as their self-confidence in mathematics. Six topics were taught and discussed in depth: adding and subtracting integers, multiplying and dividing integers, adding fractions, multiplying and dividing fractions, percentages, and fraction comparison. Research driven strategies were used when teaching each topic. And during each fifteen minute numeracy lessons, students were not allowed a calculator. The results showed a 124% increase in numeracy skills, and the surveys indicated an increased self-efficacy towards mathematics.

**S/F 50**  
**Title:** WIP Physics Camp: Informal Physics Education for Middle School Girls  
**Presenter(s):** Georgia Stuart, Current Noyce Scholar  
**Email:** georgia.stuart@utdallas.edu  
**Institution:** University of Texas at Dallas  
**Project Discipline:** Physics  
**URLs:** wipphysicscamp.wsautd.com  

The WIP Physics Camp for Girls at the University of Texas at Dallas is a free, week-long camp for middle school girls focused on inspiring girls to pursue physics. In the ten years it has been active, the camp has introduced over 200 girls to a variety of topics in physics, from mechanics to optics to electricity. This year, the camp will hold three sessions of 20 girls.

**S/F 51**  
**Title:** Using Primary Endosymbionts as a Tool for Constructing Potato Psyllid (Bactericera cockerelli) Phylogenies  
**Presenter(s):** Jessica Woodruff, Current Noyce Scholar  
**Email:** wood815@gmail.com  
**Institution:** University of Texas at Tyler  
**Project Discipline:** Biology  

Potato psyllids (Bactericera cockerelli) feed on the phloem of several solanaceous plants and are capable vectors of a phytopathogen that affects agriculturally significant crops. Within psyllids are many prokaryotic endosymbionts that are vertically transmitted to subsequent generations. In this study, evolutionary and coevolutionary phylogenies of the potato psyllid were examined using a comparative analysis of host and primary endosymbiont phylogenetic trees. The primary endosymbiont of potato psyllids, Candidatus Carsonella ruddii (CCr), is located inside specialized host cells called bacteriocytes and is essential to the survival of its host. The endosymbionts produce necessary amino acids missing from the potato psyllid’s diet. Individual potato psyllids collected from 2009 to 2011 were selected based on collection, location, and date. From these psyllids and their corresponding endosymbionts, DNA fragments of several different ribosomal protein components were amplified. Each amplified DNA product was then purified by ethanol precipitation and sequenced using the Sanger method. The resulting sequences were used to build the comparative phylogenies of the psyllid host and primary endosymbiont.

**S/F 52**  
**Title:** Investigating the Technological Chemistry Learning Environment through the Student Perspective  
**Presenter(s):** Amy Moore, Current Noyce Scholar  
**Email:** moorea8@winthrop.edu  
**Institution:** Winthrop University  
**Project Discipline:** Chemistry  

Education and technology over the past few decades have become increasingly entwined. Due to the profound influence that these electronic learning environments are having, critical evaluation of effective strategies and best practices are necessary. This study aims to explore how students perceive the online chemistry learning environment. This ongoing study has involved actively redesigning an introductory/preparatory chemistry and problem solving college class by incorporating technology in a way that maximizes the beneficial aspects of student engagement using student perception data collected via multiple surveys over the last 9 months. Overall, this study focuses on our investigation on how and if electronic material can replace traditional pedagogical methods. We hypothesize that this is only possible if the instructor is capable of anticipating student pitfalls; implementing strategies to improve comprehension, problem solving, and analytical skills; and foresee problems that may arise in an electronic learning environment. As such, to date we have focused our efforts on investigating student perceptions to address each of the aspects as the first major stage of this overall project. This study has looked at how students have shown us that they want to learn and be engaged in chemistry through an electronic learning environment.
Title: Xavier University NSF Robert Noyce Scholars Program
Presenter(s): Wes Watts, Master Teaching Fellow
Email: weswatts@ymail.com
Institution: Xavier University of New Orleans
School Name & District Currently Teaching: New Orleans Public Schools
Project Discipline: Science

The poster will highlight the two programs that are being implemented at Xavier University. One uses the Master teachers program to help teachers become nationally board certified. The other, the Fellows Teaching Scholars program, helps fellows become certified in special education.
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