Effective school leaders create school environments that nurture new teachers to succeed at teaching. The research report, *Supporting New Science Teachers: What School Leaders Can Do*, by Drs. Donna R. Sterling and Wendy M. Frazier at George Mason University identifies changes that can occur to better support new science teachers as they start teaching. The National Science Foundation funded research suggests the following policies and practices for establishing adequate support:

- Nurture new teachers in a supportive school environment where teachers help each other and the entire faculty is focused on helping students.
- Establish a plan and identify a person or team to provide new teachers with an orientation to the school, policies, and procedures.
- Provide teaching resources including teaching supplies, computer equipment, and science equipment, along with a person to demonstrate effective equipment use.
- Provide an in-class coach/mentor to support the new teachers while learning to teach, such as a retired science teacher with experience teaching the same content area as the new teacher who has time to observe the new teachers teaching over an extended period of time and suggest how to more effectively impact student learning.

Nationally, there is a growing shortage of science teachers. As a result, many school districts are forced to hire teachers with science degrees but little training or experience in teaching. These ill-prepared, new science teachers face the extra challenge of discovering how to teach on their own. Without effective support, research shows that 66 percent of these new teachers will quit the profession within three years (Darling-Hammond, 2000, 2003). A copy of the report can be found at: [http://cehd.gmu.edu/crest/researchprograms/nstsn/](http://cehd.gmu.edu/crest/researchprograms/nstsn/)

On January 14, 2010 the Board of Education approved the proposed revised *Science Standards of Learning* for Virginia Public Schools. Among the changes is an increased emphasis on the nature of science. The revised standards can be reviewed at: [http://www.doe.virginia.gov/testing/sol/standards_docs/science/review.shtml](http://www.doe.virginia.gov/testing/sol/standards_docs/science/review.shtml)

The locally scored portfolio assessment for students with disabilities, the Virginia Grade-Level Alternative (VGLA), will be replaced by a new online test starting with mathematics in 2011-2012 and reading in 2012-2013. The new online assessment, the Virginia Modified Achievement Standard Test (VMAST), is designed for students with disabilities who are learning grade-level content but cannot fairly be held to the same achievement standards as their nondisabled classmates. VMAST test items will include supports and simplified items in reading and mathematics. More information can be found at: [http://www.doe.virginia.gov/news/news_releases/2010/apr22.shtml](http://www.doe.virginia.gov/news/news_releases/2010/apr22.shtml)

For children entering grades 5-7 this summer, CREST offers two science camps – “Forensic Crime Solvers” July 12-23 and “Space Robotics” August 2-13. Tuition is $200/session. CREST utilizes camp experiences to provide science enrichment experiences for our community’s youth while providing an authentic context for training teachers in how to effectively use problem-based learning to teach science. Camp details and registration are posted on the CREST website. [http://cehd.gmu.edu/crest/camp/](http://cehd.gmu.edu/crest/camp/) For further information, contact Wendy Frazier at wfrazier@gmu.edu
U.S. – Russia Teacher Professional Development

Co-PI's Wendy Frazier (CREST) and Rebecca Fox for were awarded U.S.-Russia Teacher Professional Development Project (USRPD) for Language, Science, Technology, and Mathematics teachers from the Bureau of Education and Cultural Affairs, Department of State. The theme of the project is “teacher leaders think systematically about their practice and learn from experience.” With a focus on reaching teachers from unserved areas of Far East Russia, applications are currently under review to select 10 science, technology, and mathematics teachers and 10 English foreign language teachers to receive four weeks of professional development in Fall 2010 in the United States. Their experience will include field visits to Thomas Jefferson High School for Science and Technology (TJHSST) (lead teachers: Betsy Sandstrom and Jim Jarvis). American secondary school teachers will attend professional development for two weeks in Far East Russia in Spring 2011. Follow-on includes an alumni awards program to support on-going collaboration and a workshop conducted by Russian participants for colleagues in Summer 2011. Our in-country partner for the project is Ms. Elena Novikova, School Director of Asia – Pacific School (http://www.atsh.ru/) in the city of Vladivostok in Primorsky Kray of Far East Russia. Additional CEHD faculty participating in the creation and implementation of this grant are: Bev Shaklee, Sheryl Cozart, Debra Sprague, and Margaret Hjalmarson. Our continuing thanks to Jim Jarvis and Betsy Sandstrom from TJHSST for their collaboration on this project. For more details about the project, please see http://cehd.gmu.edu/usrtpd

Being a Graduate Research Assistant

by Elizabeth Baynard

This year I have had the opportunity to work with outstanding researchers and educators at CREST. Applying the skills and knowledge from my PhD coursework in an authentic context has inspired me. Collaborating on data analysis projects, manuscripts, and student projects has not only strengthened my research skills, but also taught me to enjoy the process. Working with the latest technology and data analysis techniques has helped me focus my future endeavors. I am aware of techniques and instruments that can shape my future research, such as a unit matrix or teacher belief q-sort. Calculating inter rater reliability as I worked with researchers to evaluate an instrument was surreal. I was able to experience research, not just read about it. Using NVIVO, SPSS, and new applications of excel has deepened my understanding of both quantitative research and qualitative research. Prior to my work as a GRA I was unaware of the long term benefits inherent in educational research. I am now keenly aware of the power of data. The trends and patterns that have emerged through analysis shed light on a new understanding of education. I am excited to continue my work with CREST and look forward to new projects next year.

Awards

- Jason Calhoun is a recipient of one of the 2010 NARST Jhumki Basu Equity Scholars Awards from the Equity and Ethics Committee of NARST. The award is accompanied by $750 for travel expenses incurred to attend NARST 2010.
- Liz Baynard received a travel scholarship from CREST to the National Association for Research in Science Teaching conference in March in Philadelphia, PA.
- Christie Wolfgang received the spring 2010 Science Education Leadership Program Award for Science Education master’s degree students.
- Wendy Frazier received the Science Educator Award (non K-12) from Virginia Association of Science Teachers in November 2009. This annual award recognizes the accomplishments of one non K-12 science educator “who has made a difference.”

Student Funding

Liz Baynard received a 20-hour graduate research assistantship to assist with CREST activities and to conduct research on the New Science Teachers’ Support Network.

Science Doctoral Students Work in Elementary Schools

The SUNRISE program (Schools, University 'N' and Resources In the Sciences and Engineering) is a partnership with the Volgenau School of Information Technology and Engineering and the College of Education and Human Development for doctoral students working on degrees in science or mathematics. This NSF GK-12 program is aimed at partnering STEM (science, technology, engineering, and mathematics) graduate students with elementary school teachers to assist them with science lessons. Seven schools in three school divisions (Fairfax County, Manassas Park City, and Alexandria City Public School) are partnering with Mason on this project. For more information visit http://sunrise.ite.gmu.edu.
In Mason’s advanced science methods course (EDCI 673) future secondary science teachers learn how to use educational technology in teaching as part of their licensure requirements. Many thanks to the following inservice teachers from Fairfax County Public Schools for teaching preservice teachers about various content-specific technologies used in science classrooms during Spring 2010: Tony Rugari (physics) Edison HS and Julie Grunwald (biology) Robinson HS.

Dr. Mollianne Logerwell (PhD 2009) continues to share her expertise with the Mason community by teaching science methods courses for preservice elementary and secondary teachers, as well as general curriculum courses for preservice/inservice secondary teachers. In addition to her teaching load this summer, Dr. Logerwell will direct CREST’s Forensic Crime Solvers camp in July. Many thanks to Dr. Logerwell for her continuing dedication to Mason and CREST.

As an institution dedicated to preparing doctoral students to be leaders in science teacher education, CREST recognizes the importance of providing adjunct teaching opportunities to doctoral students. This summer, Liz Baynard will co-teach science methods for the elementary classroom (EDCI 553) with Dr. Wendy Frazier. Additionally, they will continue a research study on the impact of poetry integration on preservice elementary teachers’ confidence, understanding of the nature of science, and science teaching practices. Please contact Donna R. Sterling (dsterlin@gmu.edu) if you are at the doctoral or post-doctoral level and wish to co-teach and/or serve as an adjunct professor in science education.

Science education faculty members in Virginia get together between the Virginia Science Education Leadership Association and Virginia Association of Science Teachers conferences to talk about science education in Virginia. Most science education faculty members across the country are the only person on their faculty that teaches science teaching methods courses. These meetings are a chance for faculty to get to know each other and share research and methods for teaching science.
Elementary Science Education

If you are interested in initial teacher licensure you should attend a “Think You Want to be a Teacher” information session. Registration for information sessions on our elementary programs is available at: http://cehd.gmu.edu/admissions/infosessions/
The deadlines for admission are October 1 and February 1, and the website for admissions information is: http://gse.gmu.edu/programs/elementaryed/admissions/ or contact Carol Ardon (sardon@gmu.edu).

PhD and Masters Degrees in Science Education for Experienced

Mason offers two advanced masters degrees for experienced science teachers and a doctoral degree in science education. Graduates are prepared for careers as school or central office leaders, curriculum and instructional materials developers, state or national agency leaders, college or university faculty, college or university researchers, or professional organization leaders. If interested in these programs in science education for experienced teachers, please read about these programs online (URLs are listed for specific programs at the end of this newsletter) and contact Donna Sterling at dsterlin@gmu.edu for more information. Admission to the masters programs is open each semester and the doctoral program every couple of years.

CREST Research Projects

The Center for Restructuring Education in Science and Technology (CREST) at Mason is designing studies, gathering data, and working on analyses of teaching and learning science. Current studies are investigating how pre-service teachers prepare for teaching science; how provisionally licensed teachers are best supported in the first few years in the classroom; how elementary teachers can increase student learning, teacher effectiveness, creativity, and ways of knowing in science; and the impact of cross-cultural exchange on teachers’ beliefs and practices with particular emphasis on unserved populations.

Program Information on the Web

Initial License with Masters in Elementary Education
http://gse.gmu.edu/programs/elementaryed/

Initial License or Masters in Secondary Education
http://gse.gmu.edu/programs/secondaryed/

Mason’s College of Education and Human Development offers a variety of degree programs involving science education. Here are links to the initial teacher licensure programs:

- Masters in Science Education Leadership (includes coursework toward administration and supervision license)
  http://gse.gmu.edu/programs/science/

- Masters in Advanced Studies in Teaching and Learning Science
  http://gse.gmu.edu/programs/astl/

- Doctorate in Science Education Leadership
  http://gse.gmu.edu/programs/science/

Center for Restructuring Education in Science and Technology

The Center for Restructuring Education in Science and Technology (CREST) at George Mason University, focuses on providing quality science, mathematics, and technology education from early childhood through adulthood.

Director: Donna R. Sterling
Associate Director: Wendy M. Frazier

For information check online at:
http://cehd.gmu.edu/crest/

To subscribe to this enewsletter, email wfrrazier@gmu.edu with “subscribe Science Education News” in the subject line.

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