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KELLOGG BIOLOGICAL STATION TO USE \$1.2 MILLION NSF GRANT IN PARTNERSHIP WITH SCHOOLS TO IMPROVE SCIENCE TEACHING

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HICKORY CORNERS, Mich. - In Michigan, as in most states, the difficulty of finding and retaining qualified teachers, especially in urban and rural public schools, is felt most keenly in the scarcity of science teachers.

To address the problem of retaining science teachers, scientists from the Michigan State University Kellogg Biological Station (KBS), together with MSU College of Education faculty members, have forged a new long-term partnership with area science teachers and administrators.

Armed with a three-year, \$1.2 million grant from the National Science Foundation (NSF), the KBS Long Term Ecological Research (LTER) in Field-Crop Agriculture project has enlisted 10 rural school districts in southern Michigan in the KBS K-12 Partnership, a unique program aimed at improving both science teaching and teacher retention.

"Without a coordinated and significant plan for continued professional growth, educators plateau in their careers and can't continue to meet the challenges presented in changing classroom environments," said Jim Gallagher, professor of teacher education in the College of Education and an advocate of teaching science for understanding. "Our premise is that teachers who have access to the most current knowledge and technology, who are skilled in the pedagogy of teaching for understanding, and who have effective mentoring will be more likely to continue as educators."

Each year, 60 lead teachers - two from each school district's upper elementary, middle and high schools - will participate in workshops during the school year. The Kellogg Biological Station will provide a science content component conducted by KBS LTER scientists, and MSU science education faculty members will lead the science teaching and leadership components. The workshops will provide teachers with a deeper knowledge of how science is conducted and how hands-on science is best taught.

An informational workshop about the project will be conducted Wednesday, Sept. 26, with six additional workshops scheduled throughout the school year. The workshop will be held from 8 a.m. to 3 p.m. in the KBS Auditorium.

"The KBS K-12 Partnership promotes improved science teaching by providing the teachers with in-depth exposure to specific science topics in ecology and in-depth training to teach science for understanding," said Mike Klug, KBS director and project director for the KBS K-12 Partnership.

Another element of the partnership includes two weeklong Summer Science Institutes. All secondary science teachers in participating school districts will be invited to attend the first week, June 24-28, focusing on science content and teaching methodology. Lead teachers will be invited to a second week in mid-August, designed to provide a deeper exposure to new science teaching methods and training in educational leadership.

The KBS K-12 Partnership also calls for graduate students to serve as resources to the schools and as an interface between KBS faculty members and the teachers. These building-level scientists are advanced doctoral students who will interact with teachers in each district about once a week.

"Few new teachers and still fewer veteran teachers have extensive training in experiment-driven science education," Klug said. "We believe that a lead teacher plus building-level scientist combination will provide the week-to-week support needed by other teachers to implement an effective inquiry-based science curriculum."

Marty Green, an eighth-grade teacher of earth science at Plainwell Middle School who serves as a liaison between the KBS faculty and the K-12 teachers, noted that the relationship between the KBS LTER researchers and the teachers was key to the partnership's success.

"You can't simply tell teachers how to do something. You have to establish a dialog with the teachers and staff before they'll open up," said Green, who is the Michigan Science Teachers Association's 2001 Michigan Middle School Science Teacher of the Year.

The KBS K-12 Partnership is an expansion of a highly successful pilot project initiated at the KBS LTER two years ago. Phil Robertson, director of LTER, applied for \$15,000 in NSF funding available through the national LTER Schoolyard Ecology Program to establish a liaison with schools. In 1999, the KBS LTER began working in partnership with middle school teachers in four local school districts - Plainwell, Gull Lake, Galesburg and Delton Kellogg - to establish the Scientific Literacy Program.

"We chose a unique tack," Robertson said. "Rather than conduct field trips or classroom demonstrations for students, we chose to help science teachers and began by asking them what ecological science they wanted to know more about. Such outreach is endemic to the land-grant mission of the KBS LTER.

"The really exciting part to me as a scientist is that ultimately we're making science exciting and accessible to future stakeholders," he said. "We're working to increase the science literacy of Michigan students. Most scientists don't get the opportunity to have such an impact at the K-12 level."

The pilot program appears to have had a huge impact. Plainwell Middle School received the Michigan's Best Excellence Award from the Michigan Association of School Boards as the result of its dramatic improvement in student achievement in science. From 1998 to 2000, the school saw the percentage of its students passing the Michigan Education Assessment Program (MEAP) 8th grade science test leap by 160 percent. The expanded program will be a more rigorous test of the education model.

"The MEAP score may be a fluke," Robertson said. "We won't know for sure until we have a longer term record with more districts. In that sense, this is an experiment. If this model works, however, it could be transferable to industry or other places where you have scientists interacting in extending knowledge into the community."

Use of technology in the classroom will be at the core of the KBS K-12 Partnership. Teachers will be introduced to Web resources, presentation materials and a wide variety of KBS research information on the LTER Web site.

"I can't begin to describe what a wealth of resources and knowledge we have available to us through KBS," Green said. "It does a lot for morale among teachers and changes the role of the teacher in the classroom - you are a learner right along with your students."

"Probably the most important thing that teachers take away from this is enthusiasm," Robertson said. "It makes the biggest difference in their science teaching."

KBS is MSU's largest off-campus education complex and one of the country's premier inland field stations. Located between Kalamazoo and Battle Creek, the 4,065-acre station includes Kellogg Bird Sanctuary, Kellogg Farm, the Kellogg Biological Laboratories, the KBS Conference Center, Extension and Outreach offices and the Lux Arbor Research. KBS' mission is to develop programs in research, education and extension directed toward a comprehensive understanding of natural and managed ecosystems and the conservation of natural resources.

For more information about KBS, visit <http://www.kbs.msu.edu/>

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