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CASE STUDIES

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THREE INNOVATIVE PRE-SERVICE TEACHER SCIENCE EDUCATION PROGRAMS

ASSET Inc. Inquiry Science Endorsement

Spearheaded by Bayer Corporation in 1992 in Pittsburgh, ASSET Inc. is a non-profit science education reform organization. Starting with five schools in two districts, ASSET today has grown to the point where it supports the core science curriculum and professional development in 38 school districts in southwest Pennsylvania, reaching more than 3,000 teachers and 63,000 students. ASSET also initiated the program in 35 school districts in eight surrounding counties.

Recent assessments, including those mandated by the National Science Foundation, show that ASSET is having a real, positive impact on student achievement in science. And, there is evidence that this impact is not only limited to science, but is crossing over to other subjects like English and math. Researchers believe that the students' achievement in these subjects is likely connected to the amount of professional development and standards-based inquiry materials used in ASSET classrooms.

Armed with this information, ASSET and its member school districts, along with partners Duquesne University, California University of Pennsylvania and Robert Morris University, created the Inquiry Science Endorsement (ISE). The ISE is designed to facilitate the preparation of prospective teachers at the undergraduate level for inquiry-based science education classrooms. To earn the ISE, K-5 teacher candidates must demonstrate their knowledge and skills in science content, methods and application to teaching. Ideally, these new teachers will enter local ASSET districts proficient in using a hands-on, inquiry-based approach to teach science.

Western Washington University Science, Mathematics and Technology Education Program

The Science, Mathematics, and Technology Education (SMATE) Program at Western Washington University (WWU) is dedicated to the enrichment and education of K-12 pre-service teachers. Under the direction of Dr. George D. "Pinky" Nelson, former astronaut and director of the American Association for the Advancement of Science's Project 2061, a dynamic group of faculty provide WWU teacher candidates with unique perspectives and talents from their academic disciplines.

The SMATE program is engaged in the reform of undergraduate courses in the respective disciplines as well as in education. Building on their research expertise, the faculty works as a multidisciplinary team while exploring how to provide the best training and support for future teachers. The program is a national model for improving teacher preparation.

Most recently, the SMATE program and its other partners in the North Cascades and Olympic Science Partnership received a five-year, \$12 million National Science Foundation grant, with the goal of advancing the teaching and learning of science throughout Northwest Washington state. According to Dr. Nelson, who also serves as the grant's principal investigator, "The vision of the partnership is to create a positive achievement spiral where improved teaching and learning in both K-12 and higher education results in ever-increasing science competencies for all students and teachers."

West Virginia -Handle on Science Project and West Liberty State College: Materials and Methods Courses

Spearheaded by Bayer in 1997, the *West Virginia (WV) - Handle on Science Project* is a science education reform program that provides extensive teacher professional development and implements National Science Resources Center curriculum materials in elementary school classrooms in 46 schools in five West Virginia northern panhandle counties, including Brooke, Hancock, Marshall, Ohio and Wetzel. The curriculum modules that the teachers use are housed and refurbished at the Materials Resource Center located at West Liberty State College's SMART-Center.

Over the years, the *WV-Handle on Science Project* relationship with West Liberty State College (WLSC) has continued to strengthen and grow, particularly with the School of Education. For example, during the first half of their senior year, all teacher candidates are required to take what WLSC calls its "Materials and Methods" semester. Students are paired with a local area teacher and spend two full days a week in a K-5 classroom, observing and teaching different core subjects. The other three days a week are spent in five separate "Materials and Methods" courses at WLSC in science, math, reading, language arts and social studies.

The WLSC "Materials and Methods" Science course professor, Tammy DeWitt, is a *WV-Handle on Science Project* teacher mentor and certified classroom observer for National Science Foundation required assessments. As a result, Professor DeWitt uses the *Project's* pedagogy and instructional materials to teach her students how to teach science. In addition, teacher candidates are required to fulfill volunteer hours in the Materials Resource Center and perform internships with many of the *Project's* teachers. What *WV-Handle on Science* and WLSC have found is that the pre-service teachers now are more comfortable and competent teaching science and the initial "science phobia," which was once prevalent, has subsided.