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Creating Tomorrow's Water Resources Professionals by Integrating Education and Extension

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Abstract Text:

The Region 2 Water Quality Project has joined forces with Research in Education Applied to Learning (R.E.A.L.) Science to create a new method of science instruction called "Community-Project-Based Learning." R.E.A.L. Science is a nonprofit organization that provides a support system for innovative standards-based authentic science projects along with effective teacher in-service training programs in science education. Community-Project-Based Learning is a newer method of science instruction that incorporates the authentic practice of real scientists into the regular classroom setting. Community-Project-Based Learning identifies a real environmental problem in the community and works with the students to address these driving questions: Is there a real problem with our watershed? What is our contribution to the problem? If there is pollution in our watershed, how can we fix it? The project objectives include the students investigating various aspects of the natural environment on and around the school grounds, students documenting findings, and students communicating these findings to fellow classmates and the community. Working in teams the students design a solution to a problem and present these solutions to their classmates. The best solutions are selected and built on the school grounds.

Project objectives include the exploration of various aspects of the natural environment on the school grounds, the detailed documentation of findings related to these explorations, and the communication of these findings to the community members in the district. These projects expose students to the actual practice of scientists in the fields of ecology and environmental science and cover issues in geology, biology, chemistry, and applied mathematics. Lessons and activities are designed with classroom teachers to instruct students within the state standards-based curriculum. The students work together to address relevant environmental problems in their community. Students also have the opportunity to work with their teachers, parents, local scientists, and other knowledgeable members of the community to create a solution to a relevant environmental problem in their community. As scientists, the students assemble existing data, collect new data, and work with professionals from the community to fully understand the problem, while honing their skills. The final products of projects are watershed restorations and sites for community education.

Two pilot projects have been completed in New Jersey middle schools. Over 375 middle schools students have been instructed on environmental issues and stormwater management. Evaluation of the success of these projects can be conducted in a variety of ways. The completion of a watershed restoration project can be considered a performance-based assessment. Individual student reports, group presentations, and student notebooks can also be evaluated for depth of knowledge and content knowledge accuracy. Student notebooks can be used as an assessment of student growth in both critical reasoning strategies and environmental sciences knowledge. The New Jersey Core Curriculum Content Standards; 5.1, 5.3, 5.4, 5.5, 5.8, 5.10 and others, can be evaluated as they are achieved via traditional standardized tests. The results from these recent projects demonstrated

significant gains from pretest to posttest on measures designed to assess the content standards. All students achieved significant content knowledge gains by project completion. Community-Project-Based learning is science education with the ability to reach all students.

Impact Statement:

This program has the potential of occurring in more than one school in a district simultaneously. This will allow the teachers to foster cooperative efforts among young scientists in the various schools that are studying related topics. This also helps to provide social motivation for the students. Our young scientists learn to value accuracy and skills in reading, writing, and communication as they share information and data about their respective projects with their peers in other schools.