Chapter 9
Developing a Web Application for the Integration of Real-World, Scientific, Problem-Solving into the Secondary Classroom

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EXECUTIVE SUMMARY

In the 21st century, digital natives, born into a world of omnipresent technology, spend much of their lives online. However, many teachers still see the use of educational technologies as a challenge (e.g., Ertmer, 2005; Li, 2007). The authors propose that the familiarity and ubiquity of these media offer a valuable way to engage students in meaningful learning. In the last decade, the National Science Foundation has invested heavily in bringing technology into the K-12 classroom by funding an array of cyberlearning applications to investigate how they can transform

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student learning. Model My Watershed is one of those experimental platforms that integrates online learning with an understanding of the physical world within an interdisciplinary framework. This case study documents the development of this application from concept through implementation and beyond. It provides insights into the challenges of application design and deployment for those entering the world of cyberlearning design.

ORGANIZATION BACKGROUND

Stroud Water Research Center was founded in 1966 and is one of the few organizations in the world devoted entirely to the study of streams and rivers. As a world-renowned scientific research center, in 1992, the Center established an Education Department to reach public audiences and 5th-12th grade students and teachers. For the last 20 years the Center's educators have engaged students, teachers, community groups, and others in a variety of hands-on, boots-in-the-water programs that teach both science and stewardship of fresh-water resources. Most of the funding for research at the Center comes from grants through the National Science Foundation (NSF). However, until recently, the Center's boots-in-the-water programs were the primary revenue source for the Education Department. With declining school budgets, the Department was no longer able to cover its expenses through such paid programming.

SETTING THE STAGE

Since education efforts began at the Center, the Education Department staff focused on in-person, outdoor, environmental education experiences. Despite some organizational ambivalence, the Center's administration was interested in expanding the scope and reach of its educational efforts to include innovative ways to reach new audiences. A Center-wide, strategic planning effort led to a decision to seek a new Director of Education who would develop a broader vision for education programming. The planning effort also resulted in the recommendation to hire a Ph.D.-level scientist to lead the Education Department, with the expectation that the new education director would function as a peer to the research scientists and would explore external funding opportunities based on ongoing research undertaken by the Center. Consequently, in 2007, after an intensive evaluation of its needs, the Center hired a new Director of Education with the expectation that she would bring the department's activities on par with the research departments, both intellectually and financially. This has resulted in a shift of focus towards large-scale grant-funded projects that explore the potential to reach new student populations via cyberlearning applications