Abstract

The Woods Hole Oceanographic Institution (WHOI) is currently exploring several models of education outreach and report here on four of these models. Web-based initiatives are designed to immerse teachers and students in the process of oceanographic research and exploration and offer models for interactive distance learning. Professional development workshops for teachers serve to increase understanding of oceanographic topics by providing access to scientists and cutting edge oceanographic research. Connecting teachers and scientists through content-rich workshops is only half of the equation. As a partner in the New England Regional Center for Ocean Science Education Excellence (NER-COSEE), we are developing “reverse workshops” that provide a forum for scientists and educators to discuss methodological needs and constraints when incorporating scientific research into the classroom. This effort will help inform scientists and educators as they explore future outreach activities. The final model actively involves teachers in scientific investigation and will provide tools to integrate this experience into their curricula. We will continue to evaluate the effectiveness of these programs and determine the best methods for bringing scientific research into the classroom.

NER-COSEE Research Workshops

The New England Regional Center for Ocean Science Education Excellence (NER-COSEE) seeks to strengthen the New England region’s capacity to develop and provide high-quality ocean science education in both formal and informal settings. Through WHOI’s involvement in the NER-COSEE, we are developing “reverse workshops” that design workshops to elicit discussions of challenges they face in incorporating this experience into their curricula. The goal of these workshops is to identify opportunities for scientific research to become involved in educational activities that have the greatest impact on ocean science education. A key component of this project is the focus on high-quality evaluation and the commitment to determine best methods for ocean science education.

The reverse workshop model is based on a WHOI pilot program that brought researchers and teachers together to discuss the realities and constraints of both classroom teaching as well as scientific research. An activity used to facilitate discussion has lead to the development of a needs assessment survey for teachers and has initiated the next steps for documenting the needs of the research community.

The intent of this project is to foster interactions between the research and education communities, and catalyze formation of lasting cooperative networks that will meet New England’s ongoing needs for ocean science education.

Teacher Immersion Projects

WHOI’s Teacher Fellowship Program involved teachers working with scientists over the course of 10-weeks during the summer. Teachers made a two-year commitment and became active participants in the research activities of the lab. Although this involvement enabled them to increase their knowledge of the scientific process, the long-term commitment dissuaded participation. An attempt to create this same sense of intimate involvement in science while addressing the needs and realities of what teachers are able to participate in has lead to the development of the Coast to Classroom project.

In the Coast to Classroom project, teachers will participate in all aspects of a scientific investigation from collecting samples in the field to analyzing data. A key component of this project is that the teachers will only need to commit to a few days over the course of a year.

The Project Team: The Project Team consists of three ocean scientists and two educators. The primary goal of the Project Team is to facilitate communication between the scientists and educators.

In addition to the background and written content provided, teacher educators interested in increasing the availability of oceanographic materials to schools from the project were offered a video and still images from sea, and are drawn by the high level of interactivity the video and still images from sea, and are drawn by the high level of interactivity of the site make it an exciting educational tool. The students show particular interest in the live aspects of the site. This project initially focused on Hawaiian schools, but has expanded to include schools from around the world.

Experiential Learning: The project goes live from sea once or twice each year. In addition to the background and written content provided, teacher educators interested in increasing the availability of oceanographic materials to schools from the project were offered a video and still images from sea, and are drawn by the high level of interactivity of the site make it an exciting educational tool. The students show particular interest in the live aspects of the site. This project initially focused on Hawaiian schools, but has expanded to include schools from around the world.

Challenges

• Reach

The workshops are designed for teachers interested in hearing about current ocean research, and those who attend are largely self-selected and repeat visitors. It is hoped that they will be able to expand the reach of this program to a broader range of participants.

• Presenters

The researchers who participate as presenters at our workshops do so voluntarily. As the program continues into its 3rd year, the challenge will be to continue to expand researcher involvement.

• Topic

Hand-in-hand with selecting presenters is selecting topics with broad interest and applicability to classroom teachings while keeping content at the correct level for most audiences.

The Topics in Oceanography workshops provide a useful way for WHOI scientists to present current research to educators, encourage the use of existing resources, and provide teachers with access to cutting edge oceanographic research. The workshops represent a “win-win” situation for educators interested in increasing their knowledge base and researchers looking for a way to interact with the educational community.

Lessons Learned

• Collaboration

While it is essential to have scientists passionately involved in this effort, it is equally important to collaborate with those responsible for translating the scientific endeavor for an K-12 audience: teachers, web designers, illustrators, photographers, technical staff, and outreach personnel.

• Planning

As most teachers need several months lead-time to incorporate the live site into their curriculum, it is important to select a cruise early enough to promote it to teachers.

• Motivation

An unexpected outcome of the live-from-sea sites was the fact that family and friends of those onboard had first-hand access to their lives and work at sea. This benefit motivated further involvement in the project of everyone onboard.

• Challenges

• Time

When the site is live, it is a very time-intensive process for both those working on the ship as well as the shore-based web person.

• Technology

In addition to the technical challenges of transmitting from remote locations far at sea, there are often obstacles to viewing and using the sites in the classroom as access to computers varies across the country.

• Evaluation

Although web statistics and user information is collected, the information is not particularly useful or easy to interpret. Since it is difficult to know who is using the site as a classroom tool, evaluation of the impact of the site is complicated.

Based on these positive feedback to the site from educators, the “Live” aspect of the site make it an exciting educational tool. The students show particularly interest in the videos and still images from sea, and are drawn by the high level of interactivity of the site. Even when not “live”, the site continues to serve as a useful resource for both K-12 education as well as scientists who use the site to help explain their work to the public.

Models For Involving Scientists in Outreach Efforts: A Multi-pronged Approach

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