A SERVICE-LEARNING PROGRAM AND ITS ROLE IN WATERSHED MANAGEMENT

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This paper describes Virginia Service Training for Environmental Progress (STEP) as an example of an internship program that integrates student service-learners into community-based watershed management projects. Since its inception 15 years ago, Virginia STEP has recruited and trained 70 interns, who have completed 47 projects. In this article, the authors share some of the program's successes and shortcomings.

The paper is divided into five sections. The first section provides background and historical information about the STEP program. The second section provides examples of how the program has benefited different communities hosting STEP interns, followed by a section on how the program has benefited the interns. The fourth section describes challenges faced in the administration of the program. The final section explains the role STEP plays in the development of watershed management professionals.

BACKGROUND AND HISTORY

Virginia Service Training for Environmental Progress (STEP) is a service-learning program at Virginia Polytechnic Institute and State University (Virginia Tech) that offers students practical work experience about environmental issues. The program combines service and learning by having college students provide technical assistance to community groups while the students learn about local, real-life environmental issues and strengthen their technical, analytical, and communication skills.

Virginia STEP, originally named the Student Environmental Health Project (STEHP), was launched in 1985. It was modeled after the Vanderbilt University (Nashville, Tennessee) STEHP program, which began in 1980. The original goal of the Vanderbilt program was to combine student training with community health service. By 1991, both STEHP programs had adopted the name STEP to reflect more clearly the broader mission of community service and "on the job" training in the environmental field.

From 1985 to 1996, Virginia STEP was coordinated through two Virginia Tech departments, Civil Engineering and Urban Affairs and Planning. In 1996, the administration of Virginia STEP was transferred to the Virginia Water Resources Research Center (Water Center). As a program of the Water Center, STEP has access to resources at Virginia Tech and at other colleges and universities in Virginia. One of the most important resources is the Virginia Tech Service-Learning Center that coordinates service-learning programs at the university.

Since its inception, STEP has addressed an array of environmental issues that include drinking water supplies, surface and ground water quality, and solid-waste management. Although not all STEP projects incorporate a watershed approach, many do, and all at least examine a component of the watershed. As a priority, STEP aims to assist communities with limited financial and technical means, but any community faced with water-related problems can solicit STEP assistance. With the exception of three projects in West Virginia and one project in Tennessee, all STEP projects have been carried out in Virginia.

Community selection for STEP projects is based on the needs of the community and the ability of STEP to meet those needs. Host groups generally are non-profit, community-based organizations, but STEP collaborates with local governments and other educational institutions as well. Host groups provide room and board and on-site supervision for the STEP interns. Site supervisors and other community leaders assist the STEP staff in developing a plan of work for the interns.

Most STEP interns have been rising seniors or students who had just completed their bachelor's degree. On

occasion rising juniors and graduate students have participated as interns. The internship availability is announced each year. Applications are accepted from any state as well as from foreign countries, but Virginia residents and students in Virginia schools receive priority for the available internship slots. Students from any discipline may apply, but applicants should have an interest in biological or environmental sciences, environmental policy and planning, political science, community development, or related areas. Applicants are assessed on academic performance, writing ability, field research experience, volunteer service, and a willingness to work and live in a host community that could be very different from their own.

An approximately 50-hour training program is provided to the interns before they go to their respective communities. The training encompasses aspects of water quality, monitoring, policy, environmental education, and safety practices. Virginia's diverse water environments – ground water aquifers, surface waters, freshwater wetlands, marshlands, estuaries, and coastal waters – and methods of sample collection, analysis, and interpretation of physical, chemical, and biological water monitoring data are discussed. Students are instructed on the value of neutrality in regard to the issues and problems, and it is stressed that their study conclusions should be based solely on the results of findings and analyses. Training time is also devoted to learn how to communicate and work with community groups and individuals. The initial training is supplemented with a mid-summer retreat to discuss the students' progress and needs, and to go over in detail the format for the students' final project reports. Field trips and career exploration seminars have also been a part of the mid-summer retreat.

Upon completion of the summer-long projects, the interns have completed tasks that address specific community problems and have documented their findings in a report for the community. The interns often make an oral presentation of their findings at a community gathering. A wrap-up session at the end of the summer allows the interns to evaluate their experience. Survey forms sent at the completion of the project allow the community groups to voice their opinions of the experience.

BENEFITS TO THE COMMUNITIES

Since its inception, 70 Virginia STEP interns have completed 47 projects. The STEP projects are designed to meet specific needs of the hosting community. For instance, within any given summer, two STEP interns may be investigating the biodiversity within a stream, while another intern in a different community studies possible contamination of drinking water, and a fourth intern helps another community understand an EPA emergency cleanup effort. In several communities, STEP interns have helped establish baseline data where past water monitoring was limited. More than one community has also requested help in training citizen water monitors, and other groups have requested help with education programs. Three examples of accomplishments achieved by interns are described below.

A 1991 STEP intern worked with the local soil and water conservation district on Chestnut Creek, a tributary of the New River in southwest Virginia. The intern completed a land use inventory for the upper part of the watershed and monitored the creek and its tributaries for point and nonpoint sources of pollution. The results indicated excessive sediment loads to the creek during high stream flows. Based in part on the intern's findings and report, the United States Soil Conservation Service, now known as the Natural Resources Conservation Service, decided to include the watershed in its Land Treatment-Watershed Protection Program.

In 1998, two STEP interns worked with various community groups to restore and enhance an existing freshwater wetland for use as an outdoor educational facility in Glade Spring, Virginia. Site plans were developed and alterations were made, including the installation of a livestock crossing guard and fencing, berm construction, drainage removal, and tree plantings. A coalition of the Adopt-A-Watershed program, the local soil and water conservation district, local high school, local college, Virginia Cooperative Extension and others was formed to continue the wetland enhancement and maintenance and to develop citizen and K-12 educational programs.

A 2000 STEP intern working in Wise County, Virginia assisted Hands Across the Mountain, Inc., a non-profit organization, with an environmental education program in the Upper Powell River watershed. The intern implemented a public outreach program about watersheds in general and about two specific community-sponsored projects: 1) the cleanup of seven illegal dumpsites along the Powell River, and 2) a septic system evaluation and subsidy program for needed repairs for 125 homes. The ultimate goal of the hosting group is to obtain citizen consensus in the development and implementation of a comprehensive strategic watershed plan.

Most host communities have been pleased with the work accomplished by the STEP interns, and several have requested assistance from STEP for subsequent

projects. A site-supervisor expressed his experience working with a 1988 intern as follows:

> "*We told her what we wanted, where we wanted it done, and how many water samples to take. She took it from there and proceeded to take [the County] by storm. She found her way around our country roads and found homes, wells, springs, creeks, and streams even our natives would be hard pressed to locate. She introduced herself to public and company officials in the water and coal business and elicited detailed information about both. Her report was very readable and contained information of use to both the county government and the citizenry at large."*

An environmental planner made the following observation about a STEP project:

> *"The study was valuable for several reasons. First, the county can now point to evidence that water quality problems can be associated with some of their allowable land uses as well as non-land-use variables (such as well type). Additionally, baseline information for future environmental surveys has been established. Finally, the very act of providing well thought-out data for the county's policy document will demonstrate the value of data for future county needs."*

BENEFITS TO THE INTERNS

STEP applicants usually express a desire to gain job-related skills, and the hired interns have consistently commented that the internship helped their career development. A 1990 intern wrote, "*Topics ranging from community politics to environmental law to scientific analysis of water were studied, giving me an incredible breadth of exposure to the environmental field."* Upon completion of the internship, students improved their job related skills, such as organization, time management, and communication. One community member explained that from his perspective, the interns were *"challenged to perform using interpersonal skills, independent schedule and task development, data collation, and comparative analysis in an environment offering little direct supervision – all vital skills they will need in today's workplace."*

By working in a community, the interns do more than gain experience using scientific methods. They also learn about working with other people. A 1986 intern stated, "*From my ten-week experience, I have learned that knowledge is not always blurted out, but is reserved and quiet. I have learned to let others lead the conversation, so as not to offend the ideas and knowledge of other concerned parties. I have also learned the importance of being a good listener."*

STEP interns typically appreciate being given the chance to learn through field research experiences, by working with other specialists, and by making their own decisions. *"Though I certainly learned plenty through reading and writing, much of what I learned last summer came through interactions with my site supervisor and members of the community,"* commented a 1991 intern. Another 1991 intern stated, *"This internship taught me a lot about the environment and policy concerning the environment that cannot be learned in a classroom. Hands-on experience in the field and in the laboratory helped me better understand how the environment works and is threatened. Working with [the community group and the community] taught me a great deal about environmental policy and the problems communities face from those policies."* A 1990 intern observed, *"It was very enlightening to see how politics, community organization, environmental law, and scientific knowledge relate in the scenario of solving environmental problems."*

Other benefits to the interns often surprise them, such as gaining an unexpected awareness about themselves, other cultures, and the world. "*Not only did this program teach me about environmental issues, but it also taught me a lot about myself,"* said a 1993 STEP intern. A 1999 intern remarked, *"This summer I was exposed to a community very different from anything I had experienced before. Everything from the way they dressed and talked to the things they ate and did for recreation were different."* Another intern explained she *"was not aware that people were drinking water that was unsafe and potentially dangerous to their health. I previously assumed everyone had access to safe water and was connected to some source of potable water."*

The knowledge gained and the appreciation shown by the communities leave a lasting impression. A 1986 intern remarked, *"This turned out to be some of my most memorable experiences. I visited people's homes from one-room shacks to large mansions . . . . From talking with them I was able to learn a lot about the area, farming and life in general. I think from talking with me they were able to learn a little about the importance of clean groundwater and how fragile it is."* A 1991 STEP intern remarked, *"Being able to have some input into the improvement of someone else's corner of the world, no matter how small, is a very unique situation. The feeling of gratitude that is felt when a community member expresses his or her thanks for the job that you are doing cannot be put into words."*

The growth gained by the STEP interns through their internships is evident to themselves, the community in which they work, and the STEP staff. One 1987 site supervisor said, *"I can say with complete honesty that our intern came away a changed person, wiser, more confident, and possessing an awareness that cannot be simply measured, or that a classroom could provide."*

After completing the STEP internship (and frequently school), many interns begin a career in the water profession. For example, a 1989 intern works as a water resources manager for a Virginia county government, where he is responsible for the overall administration of the county's water protection programs, implementation of the Water Protection Ordinance, and responses to citizen questions and concerns. A 1991 STEP intern served as Virginia's first statewide citizen volunteer monitoring coordinator for the Virginia Department of Environmental Quality, and a 1995 intern works as a watershed manager for the Virginia Department of Conservation and Recreation. Former STEP interns that work as water professionals provide excellent insight into the current skills needed by water professionals and can provide good advice on ways to improve the program.

LESSONS LEARNED

The STEP program has experienced its share of growing pains. Changes to the program have been made when necessary, and other changes will be needed as the program evolves to meet the needs of students and communities.

Advance preparation by all participants (communities, interns, STEP staff) appears to be the key to accomplishing the goals set forth by the program. The STEP staff must have a strong understanding of the program goals and capabilities and needs to initiate a meeting with the community groups several months before the interns are hired. After the study objectives are identified, a realistic work plan should be developed in a cooperative effort among STEP staff, the community, and the interns. All parties need to agree on the desired outcomes prior to the arrival of the interns in the community.

Careful selection and placement of interns is critical as well. The interns must be well trained in order to lessen the frustrations of not knowing how to complete a particular aspect of the project. Finally, the STEP directors, in cooperation with the on-site supervisors, must regularly examine the interns' plans, progress, and documentation to ensure meeting primary objectives of the program; i.e., significant learning by the students, valuable service to the community, and proper management of STEP's funds.

In the first year of the program's existence in Virginia, one host community changed its work plans between the time the staff met with them and the time the interns arrived. This caused confusion for the interns. From this experience, the STEP staff suggested that specific written contracts be signed between all groups involved in the planning and implementation of the project. It was suggested the contract should identify the specific objectives of the project, an initial work plan, and the desired end product, plus establish the hierarchy of authority over the interns. Since then, the STEP staff has worked more closely with the community groups, and this type of situation has not continued to be a problem for the program.

The objectivity of student research and data provided to communities must always be stressed. In 1988, the interns at one site were asked to leave the community during the last week of their internship because their findings were not showing what the community wanted. Since that time, the STEP staff has not only stressed the neutrality of the program to the interns but also to the community groups hosting the interns. No problems similar to this one have since arisen.

In 1989, an unfortunate automobile accident injured two interns on the way to their work site. One sustained a broken leg so was unable to participate in the program as planned. Because STEP is a program at Virginia Tech, the interns are hired as state employees and are covered by the state's workers compensation plan. Likewise the university's liability insurance would be administered in the event of a lawsuit (a situation which fortunately has never arisen for the program). The directors of STEP are responsible for knowing and following the risk-management program at the university.

Some issues have plagued the program on more than one occasion. Because STEP brings together people who do not know each other and are usually from different backgrounds and have different views of life, personality conflicts arise from time to time. This is most likely to occur between two interns working together at a site or between the interns and their site supervisor. These issues are addressed at the site visits and intern training. Tolerance for others is stressed, and the staff works with the involved parties to mediate a solution. A 1993 intern attempted to look at the bright side of his less than desirable situation, saying, "*My internship required me to work hand-in-hand with a partner and site supervisor, whose values were not*

consistent with my own, as well as in some adverse living conditions . . . . [This provided] me with first-hand experience in compromising and dealing with difficult people and situations."

Financial stability remains the largest stumbling block to the program. For 1999-2000, the estimated cost per summer intern was approximately $5,000. Typically, the local sponsor provides room and board, with STEP covering other costs including student wages (approximately $2,000), travel, etc. The above figure does not include faculty and administrative costs. At present, Virginia STEP is supported through external grants along with in-kind support from Virginia Tech and other organizations. The need for funding frequently limits the number of interns that STEP can hire and the number of communities it can assist. To a lesser extent, financial constraints can also limit the program's effectiveness – for example, the number of water samples to be analyzed for a project may be decreased owing to financial constrains. Each year, a significant portion of STEP staff time that could be directed toward program development and implementation is consumed by fundraising activities.

STEP'S ROLE IN DEVELOPING EFFECTIVE WATERSHED MANAGEMENT PROFESSIONALS

In recent years, management at the watershed level has grown in popularity as a way to solve water-related problems and to protect water quality and quantity. For example, across Virginia citizen-led, watershed-based conservation roundtables are being formed, and state agencies are increasingly managing waters at the watershed level. In order for water professionals to work at the watershed level, they need a comprehensive and interdisciplinary education. They must be able to integrate sound watershed management practices with the goals and values of the watershed stakeholders.

To prepare students for entering watershed management professions, colleges and universities need to integrate watershed management into their curricula in an interdisciplinary fashion. There is also a stronger need for hands-on-learning in a community environment and more rigorous development of problem-solving skills. To meet these needs, colleges and universities need programs such as STEP.

Through its internship program, STEP will strive to provide an educational experience that holistically meets the goals of watershed management. STEP will continue to give its interns "real-life," environmental problem-solving experiences that provide a valued service to Virginia's communities through watershed management projects. STEP will work to promote the development of university-community-agency partnerships in watershed research and education. Finally, the program will continue to seek and respond to feedback from community partners, and current and former STEP interns.

AUTHORS

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