Investigation of Social Neuroscience for the Benefit of Conservation Biology

Introduction

As one of a group of idealistic graduate students at the University of Wyoming in the early 1990s, I paid close attention to the growing call for scientists to work with the general public on real-world problems (Brewer et al. 1997). Even then, I could see that it would be difficult to engage the public in a meaningful dialogue about the environment if policymakers and others did not have a basic understanding of the science we do. The serious environmental problems we face in the twenty-first century will not be solved solely by collecting more data—results that may never make it into the hands of decision-makers. We do not have the time to wait for our discoveries to "trickle down" to the public through the filters of textbooks and other media. We must take more responsibility for translating the results and significance of our research in a way the public—our families, neighbors, and communities—can understand.

This is an exciting time to take on the challenge of charting new directions for the education section of Conservation Biology. As the new education editor, I plan to focus our attention on the successful practice of conservation education—the practical nuts and bolts of connecting teaching with learning to cultivate conservation literacy. In the coming few years, there will be fundamental questions to discuss and answer in this section of our journal: (1) What do we want conservation biologists to know and be able to do? (2) How can we successfully translate new conservation knowledge for the benefit of the general public? (3) How will we know if these educational methods and approaches have been successful? All these questions about teaching and learning, long ignored by many in the academic science community, are critical to the future of conservation biology and for that reason will be major emphases of future articles. Upcoming columns and contributed papers will explore new horizons in conservation education, feature national and international programs and approaches that work, and document educational effects with data.

Conservation Education: No Longer Business as Usual

What do we want conservation biologists in the twenty-first century to know and be able to do? It has been argued that one of the most important responsibilities educators have is helping students learn to make defensible judgments about vexing problems (King & Kitchener 1994). Whether or not our students ultimately become teachers, it is critical that we ask ourselves what changes are needed in the training of conservation biologists so that they can more knowledgeably contribute to social decisions related to the environment. Business as usual in conservation education at all levels may not be sufficient to address future environmental questions, issues, and problems. Just as the field of conservation biology has evolved and matured over the last few years, I argue that our understanding of how to better connect teaching with learning has evolved and matured as well. Our challenge, then, is to craft curricula and pedagogical strategies in which thinking skills and conceptual understanding are inextricably linked.

Most agree with E. O. Wilson that environmental solutions require cooperation among professionals long separated by academic and practical tradition (Wilson 1992). Nonetheless, consensus has not yet been reached on the most effective ways for students to learn how to integrate knowledge and to develop the processes, skills, and attitudes necessary to make substantive contributions to the field of conservation biology. Clearly, opportunities to work as part of a multidisciplinary team, in the context of small groups, classrooms, departments, and a given field as a whole, are imperative in the preparation of future conservation biologists. But there are other real-world learning opportunities to consider as well.

For example, although science provides a critical lens for evaluating complex environmental issues, the social sciences, humanities, arts, and law all provide additional lenses through which we can approach and understand these issues. In the future, we must consider how new approaches to conservation education can incorporate "metadiscipline" training to ensure that professionals are better informed and more skilled in translating information across disciplinary boundaries. One exciting area for research is to identify the "transdisciplinary" concepts and processes needed in the curricula of future professionals and an environmentally literate public (Berkowitz et al. 1997).

It is particularly heartening to note that graduate students and new post...
doctoral associates are actively looking for training on “how to teach.” These new conservation professionals are eager to participate in workshops on teaching at future meetings of the Society for Conservation Biology. The types of training our students and post-docs want include learning basic teaching strategies (both for pre-college and college students) and learning how to design a course and create and use case studies in teaching. Their enthusiasm and expressed interest in teaching bodes well for the future of conservation education and biology.

Capturing the Public’s Imagination and Understanding

It is important to ask ourselves how we can successfully translate new conservation knowledge for the benefit of the general public. Specifically, we need to determine the most effective ways of translating the science of conservation biology in a way that stimulates the attention, imagination, and action of the general public. The audience for conservation education is broad, including current and future professional conservation biologists, teachers and their apprentices, students, legislators, policymakers, and citizens from all walks of life. To what extent do we understand how political, social, economic, and legislative forces and movements influence how successfully we cultivate conservation literacy in these different segments of the audience? And how do conservation biologists bring the results of their research to an educated lay audience?

In The Log from the Sea of Cortez, John Steinbeck (1941) wrote that he had never heard of a single great scientist who could not discourse freely and interestingly with a child. I argue that all scientists should be so skilled; but if this is our goal, then new educational approaches are clearly needed. Modeling and practicing these new approaches with our students is one step toward communicating the science we do beyond our scientist peers. Another step is to require graduate students to write one chapter of their thesis or dissertation that “translates” the results of their research for a nonscientific audience. I believe that sharing the results of our science beyond the ivory tower should be a critical part of the researcher’s role in promoting scientific literacy—communicating about science in a way that captures the imagination and understanding of the communities in which we live.

Many SCB members understand the importance of communicating to a wide audience and have taken leadership roles in a diverse array of conservation education initiatives across North and South America. These include programs focused on education from elementary schools through graduate schools, teacher/scientist partnerships, outreach to business leaders and legislators, adult-education programs (including some for astronauts!), and teacher training. It is critical that when we discuss education in the pages of this journal we do not ignore the important work happening outside the formal classroom. Members of the Society for Conservation Biology are volunteering in their communities, leading efforts in conservation activism, producing films and digital nature guides, and creating educational materials for organizations such as museums, nature centers, botanical gardens, and zoos. The well of experience related to both formal and informal conservation education is deep among SCB members, and opportunities are plentiful for broadening the impact of their efforts through collaboration and the SCB.

Moving from Anecdote to Data

But do these conservation educational methods and approaches work? As all of us begin to routinely introduce new teaching ideas, collaborations, and education standards into our curricula, how will we know we have been effective? What are reasonable expectations for learning and application within the module, course, and curriculum? And how do we measure achievement outcomes? One obvious first step is that we must agree on the criteria and type of evidence we need and will accept to judge the effectiveness of conservation biology and education curricula. Ideally, students, departments, and schools as a whole need to collect and present evidence of how content understanding has been integrated with thinking approaches. Precious few data have been collected and disseminated that document the extent to which students are able to use their disciplinary knowledge and thinking tools to solve the type of problems studied by professional conservation biologists.

It is not surprising that little is known about how the general public comes to understand conservation issues and the science that informs these issues. This is yet another opportunity for assessing strategies in conservation education at local, regional, national, and international levels (for example, by using case studies to determine what does and does not work; e.g., Jacobson & McDuff 1997).

Pushing the Frontiers of Conservation Education

We stand at the brink of exciting changes and progress in conservation education, and many topics are well suited to this section of Conservation Biology. Readers of this journal must help set the agenda for conservation education by submitting papers describing the results of innovative approaches for consideration and possible use in this section of the journal. In particular, we need papers that illustrate innovation in conservation education for a wide range of audiences, including pre-
college students and their teachers, undergraduate and graduate students, and the general public. Contributions should address critical challenges (e.g., influence of high-stakes testing, training of teachers), methods (pedagogy and epistemology of developing conservation literacy), and recent innovations (e.g., influence of technology and distance education) of educating the public and biologists in the science of conservation biology in both formal and informal venues. Please contact me about your papers and your ideas and comments on how we can best share with our colleagues the new knowledge and educational approaches being developed and successfully demonstrated in our field.

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Literature Cited