

Schooling for Sustainable Development 4

Rosalyn McKeown  
Victor Nolet *Editors*

# Schooling for Sustainable Development in Canada and the United States

 Springer

# Schooling for Sustainable Development in Canada and the United States

# Schooling for Sustainable Development

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## Volume 4

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### *Series Editors*

John Chi-Kin Lee

Michael Williams

Philip Stimpson

This book series addresses issues associated with sustainability with a strong focus on the need for educational policy and action. Current attention and initiatives assume that Education for Sustainable Development (ESD) can be introduced successfully and gradually into schools worldwide. This series explores the issues that arise from the substantial and sustainable changes to be implemented in schools and education systems.

The series aims to counter the prevailing Western character of current research and enable cross-cultural comparisons of educational policy, practice, and project development. As a whole, it provides authoritative and comprehensive global coverage, with each volume providing regional/continental coverage. The volumes present data and insights that contribute to research, policy and practice in ESD-related curriculum development, school organization and school-community partnerships. They are based on ESD-related project experiences, empirical studies that focus on ESD implementation and teachers' perceptions as well as childhood studies that examine children's geographies, cultural characteristics and behaviours.

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Rosalyn McKeown • Victor Nolet  
Editors

# Schooling for Sustainable Development in Canada and the United States

 Springer

*Editors*

Rosalyn McKeown  
Secretariat of UNESCO Chair  
York University  
Toronto, ON, Canada

Victor Nolet  
Woodring College of Education  
Western Washington University  
Bellingham, WA, USA

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# Series Editors' Introduction

Education for Sustainable Development (ESD) has rapidly become part of educational discourses worldwide. Within the global attractiveness of ESD lie both its strength and its weakness. Its strength lies in its capacity to alert educationists, broadly defined, to a shared concern for the future of both the planet and local communities. Its weakness lies in its lack of shared meaning and, stemming from this, the enormous difficulties encountered in trying to bring ESD into the mainstream activities of educational institutions.

In designating the period 2005–2014 as the Decade of Education for Sustainable Development, the United Nations sought to bring to the fore the need for politicians, policymakers, and practitioners to seek ways by which ESD can become part of the fabric of formal, non-formal, and informal education. At the heart of the numerous initiatives that have been stimulated by this designation is the assumption that ESD should be introduced and can be introduced successfully into schools worldwide. It is assumed that children, older students, and adults can be educated to act now in the interests of a sustainable future.

What is evident is that different nations, and indeed sometimes different authorities within nations, have adopted different approaches to ESD, sometimes interchanging the term with environmental education, another term subject to a wide range of interpretations. These differences are evident in educational practice in regions, districts, and individual schools as well as in academic studies and commentaries. Obviously, this is not to say that there is not some common ground in policies and practice. It is simply to keep to the forefront the recognition that, even when nations make pronouncements about aspects of ESD, these should not be treated as authoritative statements about what is happening at the school and classroom levels. Broad statements have a value in highlighting issues and trends, but they need to be treated with caution. The same caution needs to be applied to pronouncements emanating from academic sources. Academics, together with practitioners, have their own agendas, and care must be taken when reading what may appear to be authoritative statements about developments in ESD occurring within their own communities and nations.

Our series addresses the array of issues arising from attempts made to convert assumptions about, and definitions of, ESD into substantial and sustainable changes principally in schools. Underpinning the series is a concern for identifying those cultural forces that impact on national, regional, and local adaptations to approaches to ESD that have international currency. The series presents views from across the world and offers contrasts in perspective. Research and scholarly studies in ESD are commonly underpinned by values and assumptions derived from Western culture, broadly defined. The design of the series as a set of largely continent-scale books seeks to bring together experts from various countries in each continent. The books bring out contrasting experiences and insights with a range of descriptions and explanations of policies and practice.

Within the broad cultural contexts of the continents and regions included in the series, authors provide evidence of policies, formal curriculum developments and innovations, and informal school-related activities. Some authors have paid close attention to policymaking at various levels, others have addressed whole-school organizational issues, and others have provided detailed case studies of localities and individual schools.

Children and young people live in distinct worlds of their own. They have distinctive cognitive and affective characteristics that vary from one culture to another, at whatever scale that culture is defined. They are also often targets for environmental campaigns that wish to promote particular behavioural changes. ESD is often construed as an attempt to change habits and to encourage children and young people to “think globally and act locally”. This series demonstrates how this and other slogans are translated in education systems and schools worldwide.

This volume focuses on Canada and the USA, two countries which face many common challenges to sustainable development. Both countries have high standards of living but have problems arising from intensive production, burgeoning consumption, and widening income inequalities. These have wider implications. For example, water demand and land degradation pose risks to a sustainable future in many areas; mineral extraction increasingly moves to the margins of exploitation, demanding ever more sophisticated but risky technological solutions. Beyond this, there are issues concerned with living in areas of tectonic instability and extreme weather and with global climate change. Often environmental catastrophes have disproportionately affected poor and minority communities. As the people of Canada and the USA experience the social, economic, and ecological impacts of a changing environment, the ways individuals and communities in both countries react today will have tremendous implications for future generations. On the other hand, Canada and the USA have, in the past, differed in their political and cultural priorities and perspectives towards the natural environment. This has presented different challenges and opportunities for education. Rosalyn McKeown and Victor Nolet, the editors, have brought together an array of chapters highlighting recent

perspectives and innovations related to ESD in the two countries. A central feature of this volume is a synthesis of the extent to which issues of ESD in all its forms are addressed within programmes both formally and informally.

John Chi-Kin Lee  
Michael Williams  
Philip Stimpson





# Acknowledgements

*The vitality of thought is in adventure. Ideas won't keep.  
Something must be done about them.*

Alfred North Whitehead<sup>1</sup>

Education for Sustainable Development is an idea that will not keep. We wish to express our deep gratitude to the courageous people who find that they simply must do something to help create a more just, healthy, and equitable world. First and foremost, we wish to thank the authors of the chapters in this book for sharing their wisdom, experience, and time. These authors are educators, innovators, leaders, and doers who have toiled for years, in some cases decades, to reorient education institutions in Canada and the United States toward sustainability. They have prevailed in the face of indifference or opposition, and the world is a better place today because of their creativity and perseverance.

In his April 4, 1967, speech “Beyond Vietnam”, Martin Luther King called for a “revolution of values” to conquer the “giant triplets of racism, extreme materialism, and militarism”. That speech predated the emergence of “sustainable development” by almost two decades, but the kernel of sustainability was certainly present in King’s thinking. Today, a transformation of values is taking place in K-12 classrooms, school gardens, on college campuses, and in state and provincial education agencies. It is happening because thousands of children, youth, college students, teachers, professors, nonformal educators, education administrators, and policymakers have decided to “do something” to reorient education systems worldwide to address sustainability. To those individuals, we also express our profound gratitude.

We are deeply indebted to our spouses for all that they have done to help this project along. Rosalyn thanks Gene for his generous encouragement, support, and

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<sup>1</sup> In Price, L. (1954). *The dialogues of Alfred North Whitehead*. Boston: Little Brown.

patience. Thank you Gene for sharing the vision that we can live in a more sustainable world and that education is an important part of creating that future. Victor thanks Geneva for her unflagging enthusiasm, patience, and encouragement. Thank you Geneva for all the ways that you make the world a better place.

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# Biographies of Contributors

**Allyson Atkins** Allyson Atkins is Curator of Education with Disney’s Animals, Science, and Environment. She leads educational programming for groups at Disney’s Animal Kingdom®, groups and guests at The Seas at Epcot and Disney’s Animal Kingdom Lodge, as well as outreach into the local community. Allyson’s background is in zoo and aquarium education with over 17 years of experience in the field of conservation education. Allyson served as a co-administrator and course instructor for the AZA Conservation Education professional training course. Allyson holds B.S. and M.S. degrees.

**Curt Belton** Curt Belton is the principal of Rockwood School and has worked for the past 27 years in the Winnipeg School Division in the province of Manitoba. He sits on the division’s Education for Sustainable Development (ESD) committee. He is also a member of the Manitoba Education for Sustainable Development Working Group. Curt is also researching Successes, Drivers, and Barriers to ESD in Canada, England, and Australia through the Environmental Conservation Lab at the University of Manitoba. Curt holds a B.Ed. and is earning an M.Env.

**Carolee Buckler** Carolee Buckler, in her role as the Sustainable Development Coordinator at Manitoba Education, coordinates ESD activities at the regional, national, and international levels. Her work involves forging partnerships with all sectors/stakeholders to work together to support a culture of Education for Sustainable Development in Manitoba. Carolee is the co-chair of the Manitoba Education for Sustainable Development Working Group, chairs the Manitoba Faculties of Education ESD committee, chairs the Council of Ministers of Education Canada-ESD working group, and supports Canada’s representation on the UNECE ESD Steering Committee. She holds B.A. and M.A. degrees.

**Ginny Carlton** Ginny Carlton is a part-time lecturer and adjunct faculty member at the University of Wisconsin-Stevens Point, College of Natural Resources. Since 1997, she has also served as the administrative specialist for the Wisconsin Environmental Education Board, a state-mandated policy setting board created to promote environmental education in all segments of society. She is an environmental



educator with more than 25 years of experience in both the non-formal and formal sectors. Ginny is an appointed member of the Wisconsin No Child Left Inside Coalition.

**Thomas Chandler** Thomas Chandler is an associate research scientist at the National Center for Disaster Preparedness, Columbia University, and an adjunct assistant professor at Teachers College, Columbia University. He is currently teaching courses regarding sustainability and social vulnerability to disasters. He has contributed to several curriculum guides, such as *Teaching the Levees*. He was previously a high school social studies teacher. He holds B.A., M.A., and Ph.D. degrees.

**Wendy Church** Dr. Wendy Church is the executive director of Facing the Future, a national nonprofit organization that brings sustainability education to over 1.5 M students each year. Facing the Future serves teachers and students in every US state and over 100 countries and has twice won the NAAEE award for Outstanding Service to Environmental Education. Wendy has taught classes ranging from basic math to environmental engineering at the university level and co-authored numerous articles and books on sustainability education including two textbooks. Wendy holds B.S., M.M., and Ph.D. degrees.

**Jen Cirillo** Jen Cirillo is the Director of Professional Development at Shelburne Farms and coordinates the Sustainable Schools Project. She is the co-chair of the K-12 and Teacher Education Sector of the US Partnership for Education for Sustainable Development and the co-chair of Vermont SWEEP (Statewide Environmental Education Programs). Jen works to support schools in using sustainability as a lens for school transformation and innovation. Her work spans the globe from Vermont to China and places in between. Jen holds B.S. and M.S. degrees.

**Gerry Connelly** Gerry Connelly is a co-director of the Sustainable Education Academy at York University. Gerry is the former Director of Education of the Toronto District School Board (TDSB). Gerry has served as Director of the Curriculum and Assessment Policy Branch in the Ontario Ministry of Education. Gerry's career includes teaching and administration in both rural and urban environments at both the secondary and post-secondary levels. Gerry is the recipient of many awards including the Distinguished Educator Award from OISE/University of Toronto.

**Margaret S. Crocco** Margaret Crocco is dean of the College of Education at the University of Iowa. Before that, she was a professor, program coordinator, and department chair at Teachers College, Columbia University in New York City. She taught history and government for 8 years at a high school in New Jersey. She has been editor or author of eight books and numerous articles, chapters, and research reports. Crocco has also led several writing teams that have produced curriculum to accompany documentary films. She holds A.B., M.A., and Ph.D. degrees.

**Don Dippo** Don Dippo is currently an associate dean of Undergraduate Programs in the Faculty of Education at York University. His interests include the social and political organization of knowledge, environmental and sustainability education, and global migration and settlement; university/community relations; and teacher education.

He serves on the Executive Committee of the Centre for Refugee Studies at York University and is on the Board of Directors of Success Beyond Limits, a not-for-profit organization supporting youth in the Jane/Finch community of Toronto. Don holds B.S., M.A., and Ph.D. degrees.

**Noah Weeth Feinstein** Noah Weeth Feinstein is an assistant professor at the University of Wisconsin-Madison, where he has a joint appointment in Curriculum and Instruction and Community and Environmental Sociology. His research focuses on science literacy and public engagement with science. He is currently studying how museums and science centers address issues of equity in science learning, how education for sustainability is evolving in the United States, and how farmers think about climate change. He is an affiliate at the Holtz Center for Science and Technology Studies. Noah has a doctoral degree.

**Eric Foster** Eric Foster has been the managing director of the Dearness Environmental Society since 1997. Prior to his tenure with Dearness, Eric was the principal of West Humber Collegiate Institute in Etobicoke, where he initiated, developed, and facilitated the implementation of a plan which saw this inner-city school become North America's first environmentally focused high school. This unique initiative not only enhanced the profile of the school community but also had a positive impact on student grades, absenteeism, enrolment, violence, and vandalism. Eric holds B.A. and M.Ed. degrees.

**Jennifer Foster** Jennifer Foster is the chair of the President's Sustainability Council at York University. She is also the coordinator of the Urban Ecologies certificate program at York and is an assistant professor in the University's Faculty of Environmental Studies. Jennifer's research focuses on urban planning and design, ecological restoration, and postindustrial urban ecological systems. She holds B.A., M.E.S., and Ph.D. degrees.

**Joe E. Heimlich** Joe E. Heimlich is a professor and specialist with Ohio State University Extension, based at COSI. He is also a professor in environmental education and interpretation at OSU and a senior research associate with the Institute for Learning Innovation. He is the author of numerous academic journal articles, chapters, books, and white papers and has written more than 250 popular publications. Joe is widely known for his methodological work in research on, and evaluation of, free-choice learning. Joe holds B.A., M.A., and Ph.D. degrees.

**Charles Hopkins** Charles Hopkins is a UNESCO Chair on Reorienting Teacher Education to Address Sustainability and a United Nations University Chair on Education for Sustainable Development. He sat on the writing committee for Chapter 36 of Agenda 21 "Promoting Education Public Awareness and Training". Previously, he was a superintendent of Curriculum and Instruction of the Toronto Board of Education, a regional superintendent, a school principal, and a teacher. He holds B.S., M.A., and two honorary doctoral degrees.

**Brad Kuntz** Brad Kuntz has taught Spanish at Gladstone High School near Portland, Oregon, for 7 years. In addition, he leads the National Honor Society, began and runs the school's environmental club, and created and teaches a course entitled Environmental Leadership. In 2011, he was awarded the Outstanding Young Educator Award by ASCD (formerly the Association for Supervision and Curriculum Development). He holds B.A. and M.S. degrees.

**Anand R. Marri** Anand R. Marri is an associate professor of Social Studies and Education at Teachers College, Columbia University. He is a former high school social studies teacher. His research examines the ways in which urban students can be better educated for active citizenship. In addition to authoring several chapters, his work has appeared in journals such as *Action in Teacher Education*, *Journal of Social Studies Research*, *Social Education*, *The Social Studies*, *Teachers College Record*, *Urban Education*, and *Urban Review*. He holds A.B., A.M., and Ph.D. degrees.

**Anne MacDiarmid** Anne MacDiarmid, in her role as ESD consultant, provides ESD curricular support, resources, and professional development opportunities for the Manitoba public school system. A highlight of these initiatives is the provincial K-12 ESD Web site <http://www.edu.gov.mb.ca/k12/esd/> with grants, resources, and support material for educators. Anne participates in many ESD committees in Manitoba working with students, educators, and others to promote participation and develop resources related to ESD. Anne taught biology and science at the senior-year level. Anne holds B.S. and a B.Ed. degrees.

**Nancy Lynn McGee** Nancy Lynn McGee has been with the Toronto and Region Conservation Authority (TRCA) since 1993. For years, she taught at TRCA's residential field centers. Currently, she is the supervisor of Education Program Services where she explores evaluation and assessment, funding opportunities, program development, and teacher engagement as they relate to non-formal education. Central to her role is the challenge of integrating and sustaining the authentic learning opportunities experienced in non-formal settings with formal education commitments. Nancy holds B.S., B.Ed., and M.Ed. degrees.

**Rosalyn McKeown** Rosalyn McKeown is the secretariat for the UNESCO Chair and International Network on Reorienting Teacher Education to Address Sustainability. Previously, she was director of an educational research and outreach center at the University of Tennessee. She is a former high school teacher and teacher educator. She has over 60 publications including the *Education for Sustainability Toolkit* (<http://www.esdtoolkit.org>), which has been translated into 20+ languages. Her current work is related to "explaining ESD to the international education community". Rosalyn holds A.B., M.A., M.S., and Ph.D. degrees.

**Victor Nolet** Victor Nolet is a professor in the Woodring College of Education at Western Washington University. He has written extensively on issues related to education for sustainability, assessment policy, and special education. He was the founding chair of the American Association of Colleges of Teacher Education Special Study Group on Education for Sustainability and is a delegate to the

International Network of Teacher Education Institutions convened by the UNESCO Chair on Reorienting Teacher Education to Address Sustainable Development. His current work addresses the scholarship of Education for Sustainable Development. Victor holds B.A., M.Ed., and Ph.D. degrees.

**Susan Olds** Susan teaches science at Gladstone High School, leads the district's Sustainability Committee, and is a member of the Clackamas Education Service District's Sustainability Cadre. She has taught school for 18 years. Susan holds B.S. and M.A.T. degrees as well as an initial administrator's license.

**Catherine Reid** Catherine Reid is an editor, award-winning essayist, and author of a work of literary non-fiction, *Coyote: Seeking the Hunter in Our Midst*. Additional work has appeared in such journals as *Massachusetts Review*, *Green Mountains Review*, *Bellevue Literary Review*, and *Isotope: A Journal of Literary Nature and Science Writing*. She teaches at Warren Wilson College, where her courses in creative and environmental writing help bridge the distance between the humanities and natural sciences. She holds B.A., M.A., and Ph.D. degrees.

**Joyce Johnson Rouse** Joyce Johnson Rouse, educator, activist, singer, songwriter, and musician, began performing as Earth Mama® and is "Helping Heal the Planet One Song at a Time". Joyce educates with music and the arts, illustrating the interconnectedness of all life on Earth. Her eight recordings are used as educational tools in classrooms, nature centers, and learning environments all over the world. She is a founding board member of Musicians United to Sustain the Environment. Joyce holds B.S. and M.A. degrees.

**Paul Rowland** Paul Rowland is the executive director of the Association for the Advancement of Sustainability in Higher Education. Previously, Paul was the Dean of the College of Education at the University of Idaho and Dean of the School of Education at The University of Montana. Paul also held administrative positions in environmental education and academic assessment at Northern Arizona University. A former high school science teacher, he has written widely on science, environmental, and sustainability education. He holds a B.A., an M.S., and a Ph.D.

**Susan Santone** Susan Santone is the founder and executive director of Creative Change Educational Solutions, a national non-profit focused on sustainability education. In her role at Creative Change, she has developed courses and teacher education programs in partnership with schools, universities, and non-profits. She is a former classroom teacher and an adjunct instructor in Teacher Education at Eastern Michigan University, where she has taught "Schools in a Diverse and Democratic Society", "Teaching Ecological Economics", and "The Science and Economics of Green Design". She holds B.A. and M.A. degrees.

**Vicki Connelly Searles** Vicki Connelly Searles is the curator of education at Cleveland Metroparks Zoo in Ohio. She administers the Advanced Inquiry Masters Program in science and education through Miami University. She has led conservation education programs for over 20 years, is a Certified Interpretive Planner with the National Association of Interpretation, and is the board president of the Cleveland

Regional Council for Science Teachers. She is dedicated to inspiring others to take action to improve the future for wildlife and coexisting human cultures.

**Laura Skelton** Laura Skelton is the program director at *Facing the Future*. She has co-authored a number of curriculum resources, including *Real World Math: Engaging Students through Global Issues* and *Climate Change: Connections and Solutions*. She also co-authored draft environmental and sustainability education learning standards for Washington State. She has taught in a variety of classroom settings, including grades 6–12 and undergraduate courses. Laura holds B.A. and M.S. degrees.

**Anne Tewksbury-Frye** Anne Tewksbury-Frye is a veteran teacher who has, throughout her career, taught kindergarten through fifth grade and owned and operated a private school. In addition, her teaching experiences include teaching music and theatre and serving as an adjunct professor at St. Michael's College and The University of Vermont. She is presently the sustainability coach for The Sustainability Academy at Lawrence Barnes School. Anne holds B.S. and M.Ed degrees.

**Ken Voorhis** Ken Voorhis is executive director of Great Smoky Mountains Institute at Tremont where he has served since 1984. He and the staff have developed a varied schedule of successful residential programs that encourage children and adults to appreciate the Great Smoky Mountains National Park as well as their connection to the natural world. Ken has been involved in environmental education and connecting people and nature for over 35 years. He is an avid and published photographer, storyteller, and musician. He holds B.S. and M.S. degrees.

**Gilda Wheeler** Gilda Wheeler is currently the program supervisor for Environmental and Sustainability Education at the Washington State Office of the Superintendent of Public Instruction (OSPI). She is responsible for supporting districts, schools, teachers, and students in implementing legislatively mandated environmental and sustainability education in Washington state. This includes the development of integrated standards and assessment and professional development for classroom teachers and non-formal educators. Previously, Gilda was a classroom teacher as well as program director for a non-profit organization.

**Cynthia A. Wood** Cynthia A. Wood is an associate professor of Sustainable Development at Appalachian State University. She teaches courses on alternative approaches to development and economics in the context of sustainability in a rapidly growing undergraduate program with over 200 majors. Her publications have appeared in *Feminist Economics* and the *Canadian Journal of Development Studies*, among others. She has a Ph.D. in Economics with specializations in international development, gender, and Latin American economics.

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**Part I**  
**Schooling for Sustainable**  
**Development in Canada and the**  
**United States—An Overview**

# Chapter 1

## Education for Sustainable Development in Canada and the United States

Rosalyn McKeown and Victor Nolet

### Formal Education in the New Millennium

Formal education is at a crossroads in Canada and the United States. Children and adolescents in secondary schools report low levels of satisfaction with schools and find little curricular relevance to the lives they live today or the lives they wish to lead in the future. It should not be surprising to find that in both countries dropout rates have grown in the past decade. Among those students who stay in school, levels of engagement are low. Yet, the challenges that the youth in school today will face when they reach adulthood are daunting.

As the impacts of various environmental problems become better understood, it is becoming clear that solutions are going to be complex and will require cross-sectoral efforts. Similarly, the global recession and resultant economic and social problems have exacerbated the divide between the haves and the have-nots. The purposes of formal education are being questioned in both Canada and the United States because education systems designed for the twentieth century are not up to the task of educating children for life in an uncertain future. If formal education continues on its current path, future Canadian and US citizens will lack the knowledge and skills necessary to meet the challenges they will encounter.

Education for sustainable development (ESD), however, offers an alternative to the obsolete *status quo*. The many ways that the formal education community in Canada and the United States have begun to embrace ESD are illustrated in the chapters of this book.

---

R. McKeown (✉)  
Secretariat of UNESCO Chair, York University, Toronto, ON, Canada  
e-mail: mckeowni@utk.edu

V. Nolet  
Woodring College of Education, Western Washington University, Bellingham, WA, USA  
e-mail: victor.nolet@wwu.edu

## **Purpose and Structure of This Book**

The purpose of this book is to capture the status of education for sustainable development in the formal education sector in two countries: Canada and the United States. In these two countries, formal education generally is understood as schooling provided in the primary and secondary grades, as well as higher education (e.g., colleges and universities). Although nonformal education can play a role in raising public awareness of sustainability and in shaping more sustainable behaviors, this book focuses on formal education.

The book is a collection of essays by academics, administrators, practitioners, and providers of education for sustainable development at different levels of the formal education community. The essays reflect leading-edge practice, innovation, and depth of experience. A decade ago, the authors and organizations described in this book were pioneers in the field of ESD. In this book, they share with us their expertise, lessons learned, and insights into the ongoing success of their work. The ESD programs described in the chapters are locally relevant and culturally appropriate for the contexts in which they are found and, at the same time, they provide clear models and strategies for expanding the application and influence of ESD.

This book has seven sections: (1) Overview (2) Teacher Education, (3) School Systems, (4) Reorienting Curriculum to Address Sustainability, (5) Nonformal Education Serving Formal Education, (6) Higher Education, and (7) The Practitioner's Voice. The sections were selected to provide examples and models of ESD from various perspectives and levels. The book focuses on the contributions of schooling to help communities, provinces/states, or nations reach their sustainability goals.

The contexts for ESD are very different in Canada and the United States. Canada has embraced the sustainability paradigm since the mid-1990s, whereas in the United States, ESD was absent from the policy agenda during much of the last decade. However, the Obama administration has embraced the term, and the concept of sustainability can be found in a wide variety of federal initiatives in the United States, including the Department of Education. However, efforts to reorient education systems to address sustainability are more advanced in Canada than in the United States today.

Although this book focuses on formal education in Canada and the United States (i.e., primary, elementary, and secondary schooling through higher education), a large number of nongovernmental organizations also work to provide out-of-school experiences for pupils that address learning outcomes in the mandated state and provincial curriculums. Indeed, one of the messages that comes through in the chapters is that as the entire context of schooling evolves to meet the challenges and opportunities of the twenty-first century, the line between "formal" and "informal" education sometimes becomes blurred. The chapters in this book clearly illustrate that ESD is singularly well-suited to that changing twenty-first-century educational context.

## **Schooling and Sustainable Development**

The title of the series to which this volume belongs has two words that warrant attention: schooling and sustainable development.

### ***Schooling***

It is well understood that ESD for all people of all ages requires formal, nonformal, and informal education. The mandate for ESD is so broad that it has to be an inclusive effort. Nevertheless, this book looks at the contributions of formal education provided in primary and secondary schools and institutions of higher education to a more sustainable future. The focus on schooling is important because schools shape the majority of future voting citizenry and leaders in the world. Of course, the accessibility to schooling varies greatly around the world. In some countries, the majority of adolescents graduate from secondary school, while in contrast in impoverished and war-torn areas, few children can enroll in school. In Canada and the United States, nearly everyone has access to a free public education. In fact, education is compulsory until the age of 16 or 18 in many states or provinces.

In Canada and the United States, children and adolescents generally go to school from about the age of 5 through the age of 18. This schooling is often referred to as kindergarten through 12th grade; the abbreviation is K-12. University education is 4 years for most disciplines.<sup>1</sup> The combination of primary, secondary, and university education is referred to as K-16.

Schooling in Canada and the United States is a huge community endeavor. A school system can be among the largest employers, purchasers of goods, or providers of meals and transportation within a community. Large portions of community revenue and state/provincial revenues go to support schools. Furthermore, nonprofit organizations, such as museums, zoos, and nature centers, offer programming that helps schools meet the requirements of mandated state and provincial curriculums in interesting and engaging ways.

### ***Sustainable Development***

The other term worthy of description is sustainable development. We use the term here because of its broad international use. Sustainable development is the overarching paradigm at the United Nations to address numerous interrelated problems (e.g., poverty reduction, environmental protection, social justice, etc.). Although sustainable development is at the center of international discourse, it is also contested.

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<sup>1</sup> Achievement in higher education is often denoted by degrees: associate after 2 years of study, bachelors after 4 years of study, masters after about 6 years of study, and a doctoral degree after about 8 years.

Sustainable development is thought of as a process, in reality many processes, to attain a more sustainable future. The related term *sustainability* is both an idealistic end point of the sustainable development process as well as a paradigm for thinking about the future in which environmental, social, and economic interests and concerns are balanced. The sustainability paradigm is a large shift from the previous economic paradigm in which economic growth was accompanied by casualties in the environmental (e.g., pollution) and social realms (e.g., damage to human health), and these casualties were both expected and accepted. In the emerging sustainable economy, we have numerous examples of material that was once considered worthless effluent (e.g., black liquor from pulp mills), which was often dumped into the local environment, but is now considered valuable for recovering chemicals or materials.

Sustainability is far more than being green; it carries with it the concept of equity between individuals and groups as well as between generations. Sustainability is based on a host of values associated with human dignity and human rights. It also incorporates economic justice and poverty reduction. A full discussion of the complexity of sustainable development and its implementation is far beyond the scope of this chapter or this book, but this brief description is sufficient to provide a context for education for sustainable development (ESD).

As noted earlier, the history of acceptance of the sustainability paradigm is different in Canada than in the United States. Canada embraced sustainability years prior to the United States accepting it. For example, Canada has a history of governmental structures to monitor Canada's sustainability efforts. The 1995 amendments to the *Auditor General Act*:

- Created the position of Commissioner of the Environment and Sustainable Development within the Office of the Auditor General of Canada, giving the Commissioner specific monitoring and reporting duties, on the Auditor General's behalf.
- Required federal departments and agencies to prepare sustainable development strategies and update them every three years. (Auditor General of Canada, 2010, para 2)

The United States was slower to embrace sustainability. During the Clinton administration, The President's Council on Sustainable Development (1996) published a forward looking plan to integrate education for sustainability into all levels of the US education system; however, that plan languished during the subsequent George W. Bush administration (2000–2008). In fact, the Bush administration did not even use the term sustainability and as a result neither did some state governments.

The Obama administration has shown greater acceptance of the concept of sustainability. For example, Obama issued Executive Order 13514 Federal Leadership in Environmental, Energy, and Economic Performance in October 2009 "to establish an integrated strategy toward sustainability in the Federal Government." However, in spite of recent progress, many individuals and fields within the United States are feeling the retarding effects of 8 years of little or no attention, dialogue, or funding from the federal government for sustainability initiatives.

Environmental education, and increasingly education for sustainability, is currently considered part of a well-rounded education. For example, Secretary of Education Arne Duncan said, "Historically, the Department of Education hasn't been doing enough in the sustainability movement. Today, I promise you that we will be a committed

partner in the national effort to build a more environmentally literate and responsible society” (U.S. Department of Education, 2010, 2011a).

## What Is ESD?

Education for sustainable development, ESD, is also called education for sustainability (EFS) in Canada and the United States. ESD is implemented in many different ways; nevertheless, it contains some core elements. Tilbury (2011) from a literature review noted that ESD conveys more than knowledge about sustainability but also involves:

- Learning to ask critical questions,
- Clarifying one’s own values,
- Envisioning more positive and sustainable futures,
- Thinking systemically,
- Responding through applied learning, and
- Exploring the tension between tradition and innovation.

McKeown (2002) stated that a curriculum reoriented to address sustainability should have content, skills, perspectives, values, and issues related to sustainability. Other publications have identified characteristics of ESD (e.g., locally relevant and culturally appropriate; interdisciplinary: addresses all three realms of sustainability—environment, society, and economy) (UNESCO, 2005a). ESD is not about simply “knowing” but also about “doing” as well as valuing. It implies acquiring and applying knowledge and skills to become personally engaged with the challenge of helping to bring about sustainability—an equitable balance of environmental, societal, and economic concerns. In this respect, ESD is “action oriented” and ESD is aimed at enabling personal and collective action to improve outcomes for all, now, and in the future. ESD should be created for and responsive to the local cultural and economic contexts as well as environmental conditions. Thus, there are many ways to implement ESD successfully to help communities and countries meet their sustainability goals and attend to the well-being of the planet and all its living inhabitants.

ESD was first described in Chapter 36 “Promoting Education, Public Awareness and Training” of Agenda 21.<sup>2</sup> The big picture was that all of the world’s education systems, public awareness systems, and training systems should educate all the world citizens in ways that would lead to a more sustainable future. That means every teacher, educator, administrator, professional development trainer, community educator, public health educator, agricultural trainer, nature center docent, etc., can and should contribute to ESD for everyone from very young learners to very old

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<sup>2</sup> Agenda 21 is the official document of the United Nations Conference on Environment and Development, also called the Earth Summit, which was held in Rio de Janeiro in 1992. Agenda 21 is a comprehensive blueprint for action to be undertaken globally, nationally, and locally by organizations of the UN, governments, and major groups.

learners. There are 70 million teachers in the world and untold numbers of other types of educators and trainers. If and when the education community can make a concerted effort to address teaching and learning for a more sustainable future, the sheer number of educators will make that dream a more probable reality.

When the formal education community first started discussing ESD in the early 1990s, a general misconception permeated the dialogue. The misconception was that ESD was an add-on to the curriculum or that it belonged in the same category as dozens of other adjectival educations<sup>3</sup> like environmental education, driver education, global education, and peace education. Adjectival educations all compete for a place in the curriculum after core subjects (e.g., language arts, mathematics, social studies, and science) and second-tier subjects (e.g., art, music, health, and technical and vocational education) have been timetabled.

Status as another adjectival education is far from the original vision of ESD, that all of education would contribute to creating a more sustainable future. The potential contribution of all disciplines to ESD is captured in the “strengths model”; it posits the following:

1. Education for sustainable development (ESD) does not belong to a single discipline.
2. Every discipline, all teachers, and all administrators can contribute to ESD.
3. All disciplines contribute both content and pedagogy (e.g., inquiry from the natural sciences, spatial distribution from geography, creativity from the arts, and critical thinking from many disciplines).
4. Those who carry out the integration process to create a comprehensive ESD program must be supported and enabled by educational decision-makers (e.g., departments or ministries of education).

In the strengths-model approach, everyone is responsible for weaving sustainability into the curriculum, meaning it is not the sole responsibility of the ecology or geography teacher. The synergistic strengths of combining educational disciplines (i.e., interdisciplinary teaching and learning) into ESD are important. Inquiry from the natural sciences, spatial distribution from geography, extremely large and small numbers from mathematics, communication skills from language arts, creativity from the arts, and critical thinking skills from a variety of disciplines are all needed to study and learn about the complexity of our world and to create a better future.

### ***United Nations Decade of ESD***

Based on a recommendation from the World Summit on Sustainable Development held in Johannesburg, South Africa, in 2002, the United Nations General Assembly in resolution 57/254 created the Decade of Education for Sustainable Development

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<sup>3</sup> The term adjectival education was coined by the late John Smyth. It refers to any subfield of education that uses education or studies in their name. Over 100 adjectival educations exist.

(UNDESD) (United Nations General Assembly, 2002). The overall goal of the UNDESD is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. This educational effort has already encouraged changes in behavior that are likely to create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations (UNESCO, 2005b).

The DESD envisages a world where everyone has the opportunity to learn the values, behaviour and lifestyles required for positive societal transformation and a sustainable future. The vision also includes preparing people of all walks of life to understand, analyze, plan for, cope with, and find solutions for issues that threaten the sustainability of our planet. The DESD is such a broad endeavor that it calls on individuals and stakeholders at all levels—local to international—to be involved. Governments, civil society, NGOs and business/industry can and should have a role. (UNESCO, n.d.)

The UNDESD has stirred the imaginations of educators around the world. ESD programs have sprung up worldwide, and existing education programs have woven sustainability into their goals, plans, and programs. The midterm report of the Decade reported that although there is much on-the-ground practice of ESD, institutionalizing ESD in educational plans and policies lags behind (UNESCO, 2009).

## Four Thrusts of ESD

ESD programs around the world vary widely as they strive to be locally relevant and culturally appropriate. However, all ESD programs should seek to address four basic areas or thrusts. Those four thrusts are:

- Improving access and retention in quality basic education,
- Reorienting existing educational programs to address sustainability,
- Increasing public understanding and awareness of sustainability, and
- Providing training to all sectors of the workforce.

These four thrusts are described in the next sections. Thrusts one and two primarily involve formal education. Thrusts three and four are mainly concerned with nonformal and informal education. Accordingly, addressing all four thrusts of ESD requires actions by the formal, nonformal, and informal sectors of the education community.

The first two thrusts of ESD are the heart of this book. Each of the chapter authors and each of the organizations featured in this book have *quality* education at the heart of what they do. Furthermore, many of the authors went through processes of reorienting existing programs (e.g., traditional disciplinary curriculum and environmental education programs) to address sustainability, which is the second thrust.

### *Improving Access and Retention in Quality Basic Education*

Enrolling and retaining both boys and girls in quality basic education is important to their well-being throughout their lives and to the communities in which they live.



Basic education focuses on helping pupils gain knowledge, skills, values, and perspectives that encourage sustainable livelihoods and living daily in a sustainable manner. Although both Canada and the United States are hugely successful in enrolling children in school, keeping them there is a problem. Dropout rates in both countries have risen dramatically recently (i.e., 31% in the United States with some provinces in Canada experiencing similar statistics) (Bridgeland, Dilulio, & Morison, 2006; Richards, 2009). Compared to many nations, the high school completion rates are good; however, compared to recent history, the dropout rate has given the public cause for concern (see Chaps. 2 and 4). Providing a quality education that retains adolescents in school is a large ESD-related challenge in both the United States and Canada.

Defining quality education in a rapidly changing world is difficult, so it is not surprising that school administrators and school boards struggle with this issue. What was quality education at the end of the 1990s would not be considered quality today. Community demographics, technologies, ecosystem integrity, economic stability, and social well-being are all changing and, in some cases, deteriorating. Education has to respond to the complex changes in society and at the same time prepare students for the world they will encounter in the near future.

Increasingly, a key element in evaluating the quality of an educational experience is preparation of students for employment. A quality education addresses issues of employability by ensuring that students stay in school, complete high school, and are prepared to join the workforce or continue their education in a postsecondary program. In the switch to a green economy, this component of quality education is of growing importance. It is not surprising then that the green economy and creation of green jobs was a key theme for the Rio+20 conference in 2012 and is a core component of both Canadian and US national policy.

A quality education also responds to research on teaching and learning to meet the needs of historically marginalized populations, such as minority language speakers, children of migrant families, and students with disabilities. For example, students in need of special attention in school—those with learning disabilities, physical impairments, and emotional disturbance—are on the rise (U.S. Department of Education, n.d., 2011a, 2011b). About 13% of students in the United States receive special education services. This raises questions about how schools are staffed and equipped to handle such needs in these times of budgetary cuts. Early interventions are often successful, leading to more positive outcomes throughout students' careers as learners and throughout their lives. Students who do not adequately receive special education services disengage from school disproportionately. Such disengagement affects the quality of their daily lives now and in their futures.

In both Canada and the United States, the issue of education quality is closely linked to issues of access and equity. Both countries have struggled to ensure that poor children and students from ethnic, racial, and language minority groups have the same educational opportunities as students from middle-class and wealthy families and students from the dominant culture. In Canada, education is recognized and legislated as a fundamental social good and considered a significant human right under international human rights law. A publicly funded education system, accessible to all, is recognized as a core constitutional responsibility of provincial governments,

and access to education cannot be denied because of one's gender, ethnic origin, disability, or age.

In the United States, the 1954 *Brown vs. Board of Education* decision created the expectation that equal access to an education is a constitutional right. The Brown decision affirmed that denial of access to the social and economic benefits of an education would be tantamount to denial of equal protection under the Equal Protection clause of the Fourteenth Amendment. After Brown, schools were no longer allowed to segregate students on the basis of race. The provisions of Brown were extended to students with disabilities under federal special education legislation in 1975.

### ***Reorienting Existing Educational Programs to Address Sustainability***

Reorienting education requires revising education at all levels from early childhood care all the way through higher education. It requires rethinking what is taught, how it is taught, and what is assessed, with sustainability as the central theme. One of the main challenges to this second thrust is to educate the pupils of today to be citizens and leaders of tomorrow—a very different tomorrow. The next generation will have to do more with less. There will be more people in a world of diminishing natural resources, such as fossil fuels, arable farmland, forests, marine fish stocks, and unpolluted fresh water. The major question that underlies contemporary curriculum revision is how to educate for an uncertain future.

Much of traditional education is based on knowledge and skills; however, reorienting education to address sustainability also involves incorporating values, perspectives, and issues related to sustainability (McKeown, 2002). Although some K-12 schools are adding sustainability issues to the curriculum (see Chaps. 13, 21, and 22), the discussion of values in most school districts has not progressed much beyond character education<sup>4</sup> and may not adequately address topics such as equity and social justice. The ethical principles and values associated with living in a sustainable world, such as those in the Earth Charter,<sup>5</sup> are as important to ESD as is content knowledge.

### ***Increasing Public Understanding and Awareness of Sustainability***

Achieving national or community sustainability goals requires citizens who are knowledgeable about sustainability in general and specifically about daily actions

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<sup>4</sup> Character education takes many forms, but generally addresses the characteristics of individuals such as respect, honesty, kindness, etc.

<sup>5</sup> The Earth Charter is a declaration of fundamental ethical principles for building a just, sustainable, and peaceful global society in the twenty-first century. It is the result of a decadelong, worldwide, cross-cultural dialogue on common goals and shared values. <http://www.earthcharter.org>

necessary to help achieve those goals. Such a citizenry will require widespread community education to adopt daily practices related to energy use, waste disposal, resource conservation, social cohesion, and civic responsibility. This third thrust also requires a responsible media committed to encouraging an informed and active populace learning throughout life.

Probably the biggest challenge for Canada and the United States in this thrust is consumerism and consumer education. Purchasing habits in industrialized countries drive resource extraction, manufacturing, and transportation of goods around the world. Such consumerism also leads to environmental degradation, pollution, abuse of labor, and economic inequities in lower-income countries to support the buying habits of higher-income countries (Herrera, 2007). Such public awareness programs will require changing habits, behaviors, and ways of thinking, which is far from easy. It will take cultivating a spirit of working for the common good rather than personal comfort or gain as well as a culture of conservation and sustainability.

### ***Providing Training to All Sectors of the Workforce***

All sectors of the workforce can contribute to local, regional, and national sustainability. Both public sector and private sector employees need to receive ongoing vocational and professional training infused with the practices and principles of sustainability, so that all members of the labor force can access the knowledge and skills necessary to work in a sustainable manner and make decisions that balance economic, social, and environmental concerns. Much of the workforce in Canada and the United States attended school before sustainability was part of the curriculum. As a result, the need for training is high.

### ***Four Thrusts and Formal/Non-Formal Education***

Thrusts one and two primarily involve formal education. Thrusts three and four are mainly concerned with nonformal and informal education. Accordingly, addressing all four thrusts of ESD requires actions by the formal, nonformal, and informal sectors of the education community.

The first two thrusts of ESD are the heart of this book. Each of the chapter authors and each of the organizations featured in this book have *quality* education at the heart of what they do. Furthermore, many of the authors went through processes of reorienting existing programs (e.g., traditional disciplinary curriculum and environmental education programs) to address sustainability, which is the second thrust.

## ESD and Student Engagement

While ESD can address the major educational issues of our times (e.g., dropout rates in both Canada and in the United States and the achievement gap between students of color and White students), it does not mean doing business as usual. It means taking school reform to another level. It will “require a significant shift in our current designs for learning, the beliefs we hold about the purpose of schooling” (Willms, Friesen, & Milton, 2009, p. 1). The good news is there are models of schools that have successfully addressed these issues and they are doing it with sustainability as a theme (Tell Them From Me [TTFM], 2011).

Much of the school reform dialogue in the United States has been around testing accountability and choice (Ravitch, 2010). The irony is that although the testing of basic skills was supposed to provide data to improve education, in practice, it actually contributed to dropout rates, particularly among minority children (McSpadden McNeil, Coppola, Radigan, & Vasquez Heilig, 2008); narrowed the curriculum (i.e., the focus on test preparation); and made school less interesting (Cawelti, 2006; Crocco & Costigan, 2007; Gunzenhauser, 2003; Jaeger, 1991; Shepard, 1991). Similarly, Bridgeland et al. (2006) reported that that the majority of students in their study who dropped out of school cited as a reason “classes were not interesting.”

The problem with a narrowed curriculum is that it is unlikely to be relevant to the lives of students—either the lives they live or the lives they would like to live in the future (Certo, Cauley, Moxley, & Chafin, 2008; Marks, 2000). To understand relevancy, we have to understand student engagement (social, academic, and intellectual) in school. Each of these three types of engagement has several subcategories. For example, social engagement includes sense of belonging, participation in school teams, clubs, student government, and school-wide campaigns as well as positive relationships with peers and adults (Willms, Friesen, & Milton, 2009). Measures of disengagement include boredom (temporary) and dropping out (permanent).

The High School Survey of Student Engagement (HSSSE) in the United States reported that 98% of the students were bored, and of these, 81% responded the “material wasn’t interesting” and 42% noted a lack of relevance of the material (Yazzie-Mintz, 2010). In Canada, student intellectual engagement drops between the sixth and 12 grades ending at 37% (Willms et al., 2009). In a parallel study using similar intellectual engagement measures (i.e., those developed by the Canadian Education Association and used in the What Did You Do in School Today initiative), the Tell Them From Me survey showed that in some Manitoba schools that emphasize sustainability, the intellectual engagement rate is above the national average (TTFM, 2011; The Learning Bar, 2011). This increase in intellectual engagement may be due in part to the use of the sustainability paradigm and ESD pedagogies.

The question becomes how do we create curriculums—and for that matter schools—that are relevant to the students and engage them on several levels? Curricular relevancy should not be based on adult perspectives of relevance, but on student perspectives. Of course, there are objections to listening to and, therefore, respecting students. A mindset persists with some that children and youth do not

know what is best for them (e.g., they want us to serve cola and donuts, which are not nutritious, in the cafeteria). However, looking at the responses to student survey data gives good indications of relevance. The HSSSE quotes one student, whose comment reflects the thoughts of many, “We should be able to take classes that would actually help us in what we want our career to be.”

ESD can address what school boards, educators, and parent are concerned about (e.g., delivering a quality education and preventing dropouts), but because our concern is the same, it does not mean moving ahead in twentieth-century paths. It means being bold enough to step out of the linear progression of textbooks of distilled knowledge and toward structuring learning around the things that concern students (e.g., their future in a world where global climate change, increasing population, and decreasing natural resources will be quite different). It also means empowering students to analyze things in the world that they perceive as not right, propose solutions, and then to take action to help implement changes that contribute to solutions.

The 193 member states of the United Nations use sustainability as an overarching paradigm for thinking about a better future and solving the problems that confront the world today. The education community would be wise to adapt a similar paradigm for schooling.

## Purpose of Education

In many low-income countries around the world, education is seen as an important investment in development. Historically, in Canada, the purpose of schooling was “to provide an opportunity for general social improvement” as well as prevent “social instability” (Gaffield, 1988, p. 665). The purpose of schooling changed over the years and evolved to “develop the personal capacities of individuals, but also impart skills useful to society” (Leslie, 1988, p. 670). Since the early 1960s, in both Canada and the United States, the purpose of schooling has been “to eliminate barriers that are based on race, ethnicity, sex, and social class” (Porter, 1988, p. 672). More recently, the purpose of schooling in the United States and many other countries is for national economic competitiveness (National Commission on Excellence in Education [NCEE], 1983).

National economic competitiveness, especially within an economic growth model, as the purpose of education is undergoing scrutiny around the world. Unfettered economic growth and competitiveness have led to the destruction of ecosystems, serious depletion of natural resources, and decline of human well-being in the long term. When nations compete, there are short-term winners and multitudes of losers. In the long term, there is huge global loss. As a result, countries like Finland and Bolivia as well as provinces of Canada have changed their purposes of education to include statements of well-being and regional visions and statements of sustainability. Ministries of education see the value-added of using sustainability as a focus of education.

For years, ESD has focused on education's contribution to a more sustainable world. However, with reexamining the purpose of education, the focus is inverted and the question becomes, what can sustainability contribute to education? The answer is severalfold, including vision, engagement, and relevance.

Students of today are connected to the rest of the world through the media and social media. They arrive at school knowing that something is wrong in their communities and communities around the world. They might pass homeless people on their way to school, and the nightly news tells them of the global financial crises resulting in children going hungry in middle-class neighborhoods as well as in other continents. Students are worried about their future, especially about confronting the immense challenges of global climate change. Unfortunately, many of the things that concern them are not included in the elementary and secondary curriculums. Generally, schooling neither addresses their concerns nor empowers them to address the challenges facing the world.

Teachers and administrators report that students are tired of learning for the sake of learning; however, they are absorbed by learning that addresses their concerns and behaviors to ameliorate the problems of the world. Sustainability as a theme of inquiry addresses the problem of decreasing student engagement and the relevancy of the curriculum. Sustainability as the purpose of education addresses the concerns of the students of today.

Beyond purpose, sustainability gives a common vision to schooling—the vision of a better, more sustainable world and the positive social transformation that accompanies that vision. For students who study in schools where sustainability is a unifying theme, working toward a common good is part of that vision. (See Chaps. 21 and 22.)

## Chapters and Interrelationships Between Chapters

This book opens windows through which to view the role of schooling for sustainable development in Canada and the United States. Collectively, the chapters give the big picture, showing both breadth and depth; however, the book falls short of providing a comprehensive description of all of the ESD efforts in these two countries. Many ESD efforts, both wonderful and mundane, could not be described within these covers; however, the authors acknowledge their important contributions to ESD and the future of our world.

Chapter 2 by Charles Hopkins and Chapter 3 by Noah Weeth Feinstein and Ginny Carlton take large-scale, nationwide views of ESD. Charles Hopkins, who is an elder statesman in the field, describes the growth and progress of ESD from the late 1980s until today. The advent of the UNDES D stimulated progress in ESD across Canada. He describes major ESD efforts by the Canadian Council of Ministers of Education and the provincial government of Manitoba. Feinstein and Carlton focus on educational policy and the environmental education roots of ESD in the United States. The contrast between the two chapters poignantly reveals the differing outcomes of two

neighboring countries. The Canadian national government embraced sustainability in the first decade of the century and the United States did not. As a result, today, Canada is ahead of the United States in ESD in the K-12 years.

Chapters 4 and 5 provide an overview of teacher education and ESD in Canada and the United States. Don Dippo examines some of the persistent problems in teacher education as a context for understanding contemporary discussions about teacher education and social change. Victor Nolet describes the large challenges of K-12 education in the United States and how teacher education needs to be positioned to meet those challenges. Within that context, he describes efforts to reorient teacher education programs to address sustainability.

Chapters 6 through 10 describe the response of school systems to address sustainability. This part of the book looks at the mesoscale for ESD geographically and with a school-system approach. At the school-system level, ESD is far more than weaving sustainability into the curriculum. Gerry Connelly in her chapter on the Sustainability and Education Academy (SEdA) describes a professional development program that supports school leaders to incorporate sustainability into all aspects and activities of a school system (e.g., governance, curriculum/teaching/learning, human capacity building, facilities and operation, and partnerships). Carolee Buckler and Anne McDiarmid describe the activities of Manitoba education to incorporate sustainability into school divisions across the province. Gilda Wheeler describes the efforts of the state of Washington to incorporate sustainability into learning standards for elementary and secondary school as well as teacher certification requirements. Jen Cirillo and Anne Tewksbury-Frey describe ESD as it is practiced at the first sustainability-themed elementary magnet school in Burlington, Vermont. Eric Foster describes the efforts of the Dearness Environmental Society, a nonprofit organization, to help two school districts in Northern Ontario to weave sustainability into the curriculum, professional development, facilities operations, and community relations. This set of chapters reflects highly innovative work and years of effort to create groundbreaking ESD programs. These programs are where other states, provinces, school districts, and schools aspire to be in terms of providing quality education as well as introducing sustainability to elementary and secondary students.

Chapters 11 through 13 examine the second thrust of ESD: reorienting education to address sustainability. These chapters describe the purpose and practice of weaving knowledge, skills, perspective, and values related to sustainability into school subjects. Susan Santone explains the similarities and differences between conventional economics and ecological economics. Margaret Crocco, Anand Marri, and Thomas Chandler focus on the social studies and describe four global competencies that lead to knowledge formation, deliberation, and action. Wendy Church and Laura Skelton describe the ways in which Facing the Futures, a nonprofit organization, weaves sustainability content and perspectives into core subjects to provide a context for classroom projects, allowing students to apply academic knowledge and skills to seek solutions to real-world problems and engage in authentic community service.

Chapters 14 through 16 provide examples of ways the nonformal sector of the education community supports schools to provide ESD. Joe Heimlich, Vicki



Connelly Searles, and Allyson Atkins write about the contributions of zoos and aquariums to ESD through field trips, outreach to schools, teacher workshops, etc. Ken Voorhis describes the efforts of the Great Smoky Mountain Institute at Tremont to provide a residential immersion experience for elementary and secondary students. This chapter ends with his personal reflection on the questions that so many educators ask themselves—is it worth it? Nancy McGee describes the efforts of the Toronto and Region Conservation Authority’s almost 60-year history of providing a broad spectrum of educational programs to support formal education systems to provide ESD.

Chapters 17 through 19 look at ESD through the lens of institutions of higher education (IHEs). Paul Rowland describes the work of the Association for the Advancement of Sustainability in Higher Education, an NGO, to support efforts in both academic programs and campus operations in numerous IHEs. Catherine Reid describes the efforts of Warren Wilson College to create a sustainable campus and more sustainable world through the triad of academics, work, and service. Jennifer Foster looks at the efforts of York University, a large and diverse campus in Toronto, Canada, to incorporate sustainability into curriculum, research, and institutional programs and practices through a pan-university approach through the President’s Sustainability Council.

Chapters 20 through 23 view ESD at the micro- or individual scale. These four personalized chapters capture the voices of a musician, Joyce Rouse; two high school teachers, Susan Olds and Brad Kuntz; an elementary school principal, Curt Belton; and a university professor, Cynthia Wood. These educators share their personal insights into ESD, the schools and school systems where they work, and their interactions with students.

In both Canadian and US formal educational systems, the economic sphere of ESD is the least developed. Chapter 11 by Susan Santone and Chap. 23 by Cynthia Wood address this shortfall. Susan Santone explains and compares two economic paradigms: conventional and ecological. She explains major concepts and terminology associated with both paradigms as well as their goals and measures of success. She grounds her discussion of economics in the K-12 curriculum standards of the National Council for the Social Studies and the work of the Council on Economic Education. She also presents core concepts, guiding questions, and essential concepts for teaching ecological economics in elementary and secondary school. Cynthia Wood’s chapter takes the content of Santone’s chapter and places it in a university setting, extending the study of economics to include examination of the assumptions of the conventional economic paradigms. Wood’s work gives us a rare picture of the personal insights and pedagogical techniques and skills that go into teaching economics from a sustainable perspective at the university level.

Chapters 2, 6, 7, 10, 16, and 22 describe leading-edge work in ESD in Canada. Collectively, they demonstrate that networking within the Canadian ESD community has moved geographically distant programs forward along similar paths as their leaders share lessons learned and build on one another’s successes by adapting ideas and programs for their own local contexts. Their work has been synergistic rather than simply additive.



## *The Author's Voice*

Many of the authors in this book recount their personal experiences, reflecting on the changes in practice, distilling their thoughts over many years of work, and sharing lessons learned. Part VII *The Practitioner's Voice* is written entirely from a personal perspective. These four chapters are written in the first person as are sections from other chapters (i.e., those by Charles Hopkins, Don Dippo, Gerry Connelly, and Ken Voorhis and this chapter by Rosalyn McKeown and Victor Nolet).

First-person narratives reflect clarity and honesty about who is observing and who is participating in the study, which is often hidden in third-person statements, such as “it was observed” or “it was decided.” The shift from third-person report to first-person narrative has been underway for over two decades in the academic literature. Some fields, journals, and publishers are farther along in accepting first-person narratives than others; nevertheless, narrative is a well-recognized and respected form of academic discourse in education as well as many other social sciences.

Education for sustainable development is generally outside of the positivist research tradition,<sup>6</sup> which often thinks of researchers as remote and impartial observers. In the 1970s, social scientists became increasingly aware of the limitations of the positivist tradition, which produces quantitative data and often answers question of what, where, when, and how. Social scientists wanted to address questions of human agency—the capacity of humans to make choices and to impose those choices on the world. They sought meaning and understanding through contextual accounts, which could only be captured qualitatively (e.g., through narrative) including from the first-person perspective.

ESD explicitly supports constructive human agency that leads to positive social transformation. Thus, any collection of essays that purports to address education for sustainable development needs to include first-person perspectives and a clear recognition of their importance.

## **Concluding Remarks**

The 23 chapters of this book give the reader insights into ESD in Canada and the United States. It is not a complete panorama—that would require a set of volumes encyclopedic in length. This book opens selected windows and vantage points for understanding high-quality ESD.

The authors in this book describe successful ESD programs. Their efforts were implemented at many scales—provincial to classroom. They encompass curriculum, program, policy, and practice. They all are a result of innovation. They provide models for elementary and secondary schools and institutions of higher education

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<sup>6</sup> ESD research does use quantitative data, especially for advocacy with sectors of the education community that require or prefer numeric data.

to use and to adapt to the contexts of their own geographic locations. ESD is no longer an abstract concept; this book is filled with concrete examples of successful ESD initiatives.

Although the authors did not say it, you can read between the lines that it took years of dedication and hard work to implement their visions. It also took personal courage: courage to envision that which is possible but not mainstream, and courage to talk about that vision in such a way that others would join in making it happen. It took courage to change habits, behaviors, and ways of thinking. It took courage to say, “this is not working” and try something else. We know many of the authors of this book personally and professionally; they do not think of themselves as particularly courageous. They shared with us that they feel compelled, moved, motivated, etc., to work in ESD. One said, “It is the right thing to do” as if guided by an internal moral compass. Nevertheless, we think they are courageous.

As we were writing and editing this book, a few people asked us about controversy surrounding ESD and “push back” or rejection. Although in the early 1990s ESD met with resistance or at best indifference, from our perspective the resistance to ESD today is no greater than that for other educational change efforts. Some resistance to change is normal within the education community in Canada and the United States. This lack of controversy surrounding ESD is primarily so because those who are working in ESD have found ways to bridge the political divides that created many of the problems and challenges to sustainability that we face today. ESD pioneers have also learned to describe ESD as a solution to contemporary educational and societal problems.

Many educators today know that the path our world and our education systems are on “is not working” (i.e., leading us to a better future). They also know that continuing to do “business as usual” will make solutions in the future even harder to attain. We believe that the formal education community (i.e., ministries and departments of education, school boards, and schools) has lessons to learn from the pioneers whose work is described in this book—lessons about working toward the common good and providing quality education for the school children of today and tomorrow as well as creating a brighter more sustainable future. The leaders in formal education today need to act with courage to make changes that will secure that better future. The good news is that there are proven ESD models to follow and new ones yet to be created.

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## Chapter 2

# Education for Sustainable Development in Formal Education in Canada

Charles Hopkins

*Editor's note: Charles Hopkins is a pioneer in the area of education for sustainable development. He has been involved in education for sustainable development around the world for nearly three decades and was one of the 10 members of the committee to draft the text of Chapter 36 of Agenda 21.<sup>1</sup>*

This chapter provides a short history of education for sustainable development (ESD) in Canada and describes the current status of ESD in formal education. Because this and subsequent chapters describe ESD within the Canadian context, this chapter begins with a description of Canada and its formal education system.

### The Canadian Context

One of the major challenges of providing quality educational opportunities for all Canadians is meeting the needs of urban students and those in small remote communities as well as those in aboriginal communities. Canada is the second largest country in the world—almost 10 million square kilometers—with a population density of 3.3 people per square kilometer, one of the lowest in the world, and a per capita gross domestic product (GDP) in 2010 of \$47,609 Canadian dollars (\$46,215 USD)

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<sup>1</sup>Agenda 21 is the official document of the United Nations Conference on Environment and Development, also called the Earth Summit, which was held in Rio de Janeiro in 1992. Agenda 21 is a comprehensive blueprint for action to be taken globally, nationally, and locally by organizations of the UN, governments, and major groups.

C. Hopkins (✉)  
UNESCO Chair, York University, Toronto, ON, Canada  
e-mail: chopkins@edu.yorku.ca

(International Monetary Fund [IMF], 2011). A large portion of the population of 32.1 million lives in four major urban centers, within 300 km of the southern border with the USA.

### ***Responsibility for Education***

In Canada, there is no federal department of education and no integrated national system of education. In the 13 jurisdictions—10 provinces and 3 territories—departments or ministries of education are responsible for the organization, delivery, and assessment of education at the elementary and secondary levels within their boundaries. In some jurisdictions, separate departments or ministries are responsible for elementary and secondary education and for postsecondary education and skills training (CMEC, 2011).

### ***Regional Differences***

While there are a great many similarities in the 13 provincial and territorial education systems across Canada, there are important differences that reflect the geography, history, culture, and corresponding specialized needs of the populations served. The comprehensive, diversified, and widely accessible nature of the education systems in Canada reflect the societal belief in the importance of education. In the nineteenth century, Canadians searched the world for the “best” school systems (largely European and American), and those components deemed best became the foundations of the Canadian systems currently ranked near the top of the PISA<sup>2</sup> scores. According to the OECD, Canada provides low-cost yet high-quality higher education for a greater percentage of students than almost any other country in the world. These achievements are only made possible by the respect and priority placed by Canadians on public education. Education has traditionally been seen by government, as in most countries, as crucial for development. The concept of using education as a tool for sustainable development is only now part of the national education dialog.

## **Elementary and Secondary Education**

Public education at the elementary and secondary levels is provided free to all Canadians who meet various age and residence requirements. Each province and territory has one or two departments/ministries of education, headed by a minister

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<sup>2</sup>The Program for International Student Assessment (PISA) is a worldwide evaluation of the scholastic achievement of 15-year-old pupils. The first assessment was given in 2000 and is repeated every 3 years. It is coordinated by the Organization for Economic Cooperation and Development (OECD).

who is an elected member of the legislature and appointed to the position by the government leader of the jurisdiction. Deputy Ministers, who belong to the civil service, are responsible for the operation of the ministry/department. The ministries and departments provide educational, administrative, and financial management and school support functions. Ministries and departments of education define both the educational services to be provided and the policies for implementing legislative acts. Their responsibilities include curriculum development, assessment, teachers' working conditions, funding formulas, equity, and technological innovation.

### ***Local Governance***

Local governance of elementary and secondary education is usually entrusted to school districts, school divisions, and elected bodies (e.g., school boards). The power delegated to the local authorities is at the discretion of the provincial and territorial governments and generally consists of: operation and administration (including financial) of the group of schools within their board or division, curriculum implementation, management of personnel, enrolment of students, and initiation of proposals for new construction or other major capital expenditures.

Because provincial governments are responsible for education within Canada, there is no one national Canadian curriculum. Each province expresses sustainability in curriculum in different ways and to different degrees (CMEC, 2011). For example, the Manitoba Ministry of Education has included sustainability in their mission statement and has taken a whole school system approach to sustainability (Manitoba Education, n.d.) (see Chap. 7). In other provinces, strands of sustainability are woven into the curriculum but are not explicitly taught as contributing to sustainability.

### ***Contemporary Challenges***

Canada is facing major educational problems. The dropout rate is high or rising in the Prairie Provinces as well as in Montreal. A Canadian Education Association (CEA) survey of secondary students showed that by grade 12, only 37% of the students felt intellectually engaged in school. Intellectual engagement in school is lower than social engagement. Student feeling about the relevance of schoolwork to the lives that they lead or would like to lead in the future is low (Canadian Education Association [CEA], 2011; Willms, Friesen, & Milton, 2009). In response, Ministries of Education across Canada are working together to explore solutions to the problem of low student engagement and high dropout rates. Fortunately, there is an awakening to these problems at all levels of the formal education system. While

these traditional problems have existed in the past, they are now seen as part of ESD (i.e., through the first thrust of ESD improving access to and retention in quality basic education). Slowly, new experimental programs are moving forward to address these issues with a sustainability focus.

## **ESD in Canada: A Historical Perspective**

Canada has been involved with education for sustainable development from the inception of the international movement following publication of the Brundtland declaration in 1987. That involvement included participation in the Preparatory Committee meetings between 1988 and 1991. At these meetings, representatives from most nations met to negotiate the work program that would emerge from the Earth Summit meeting in Rio de Janeiro in 1992. That work program, later called Agenda 21, outlined the scope and strategies for moving sustainable development from a concept to a reality. As Kofi Anan, former Secretary General of the United Nations, would later say, the task of moving sustainable development from a UN goal to become a daily reality for all is one of the world's greatest challenges.

A few months after Rio, in October of 1992, Canada hosted the first international ESD conference in the world. The World Congress for Education and Communication on Environment and Development (ECO-ED) took place in Toronto. The Congress drew 4,000 participants from approximately 100 countries. It was attended by the heads of seven of the UN agencies, 300 indigenous leaders, representatives of the public and private sector, and teachers from around the world. Most significantly, ECO-ED was hosted by several core teacher associations, including science and geography as well as the North American Association for Environmental Education. ESD was not seen as EE in the beginning, nor did ESD exclude anyone or any discipline.

In addition to official governmental participation in ESD, the NGO community played an important role. For example, as ESD began and the preparations for the Earth Summit developed, a national NGO emerged called Learning for a Sustainable Future (LSF). This NGO, conceived as a national program, was designed to be jointly sponsored by the private sector and provincial and federal governments to collaboratively engage with existing proponents of ESD. LSF has contributed greatly in addressing policy issues and developing provincial and national ESD chapters.

### ***Early Challenges in Implementing Agenda 21 in Canada***

Despite Canada's early participation in education for sustainable development at the international level, there were a number of circumstances that presented challenges



**Box 2.1 Reflections on the Beginnings of ESD**

I was fortunate to be one of the ten committee members to draft the text of Chapter 36 of Agenda 21 “Promoting education, public awareness and training.” The chapter outlined the promising role of the world’s education, public awareness, and training systems to making a sustainable future more of a reality than a distant dream. We were aware that ESD is more than formal education. It must coexist in harmony with informal and nonformal education, public awareness, and training systems. Nevertheless, the role of formal education was prominent throughout Agenda 21, in every one of the 40 chapters and not just Chapter 36. Furthermore, education was also called out in the three Conventions on Climate Change, Desertification, and Biodiversity.

The hope of the drafting committee for Chapter 36 was that the world’s education, public awareness, and training systems could be of service, creating a more sustainable world. It was as simple as that. We were not suggesting that a new discipline be created. Five of the ten committee members, having been involved in EE at some point in our careers, were well aware of EE and its role as a major contributor to sustainability. However, we also realized that EE could not act alone in creating a more sustainable future. With the millions of children between the ages of 6 and 11—more than the entire school population of Europe—without access to any form of schooling, we needed to begin with access to education as a starting point for ESD. We also realized that it was our most educated countries (or should I say schooled countries) that were creating some of the greatest threats to a sustainable future. We needed to reorient our education system far beyond a vision of EE. Yet, EE was a wonderful start, and we wrote in Chapter 36 of Agenda 21 that we should learn from the EE experience.

Participation on the drafting committee gave me unique insights into the emergence of education for sustainable development (ESD) not only in Canada but globally. My involvement in the ESD story from its very beginning and my continued involvement as an advisor to UNESCO, UN University, many governmental agencies including ministries of education, NGOs, and corporate decision makers have given me voice. At times, my recommendations are acted upon. I hope, my longevity in ESD has contributed to the development of ESD in Canada.

ESD in Canada is finally approaching the dreams of all of us who drafted Agenda 21. As a Canadian educator who has been engaged with ESD for over 25 years, I feel more hopeful than at any time in the past.

for implementation of Earth Summit goals on a national level. One of the first challenges had to do with establishing a clear identity for education for sustainable development as a distinct process separate from other efforts. Federal leadership for

sustainable development was given to the ministry of the environment, which was common in many countries around the world. Environment Canada became the Canadian national leader. This leadership, while appreciated, unfortunately perpetuated the notion of ESD being the same as EE.

A second challenge had to do with the organizational structure of education systems in Canada. As mentioned previously, Canada does not have a national ministry of education. Exclusive jurisdiction for education rests with its 13 jurisdictions. This structure creates a locally responsive but nationally complex administrative structure. Initially, there were only a handful of ESD leaders who were scattered across the 4,000 miles of Canada. This combination of organizational complexity and geography created considerable difficulty for the individuals charged with organizing and coordinating ESD efforts in the 1990s and early 2000s.

The third challenge was economic. The Earth Summit occurred just as a major global recession began forcing the North to rethink the pursuit of sustainability. As formal education systems prepared for cutbacks in funding and a “back to the basics” focus on mathematics and language arts complete with extensive monitoring and evaluation, formal education leaders excluded ESD.

An additional complicating factor was that education leaders in ESD had limited access to the ministries of education, school superintendents, or even parents. Furthermore, ESD leaders had not developed effective prose to present a sound case for ESD. Because of these challenges, it took years for the ESD community to develop a strong voice in Canada.

## **ESD and Formal Education Before the UNDESD**

Sustainable development is an inclusive term, encompassing environmental, economic, and social themes such as poverty alleviation, peace, democracy, justice, human rights, gender equity, economic well-being, social equity, cultural diversity, rural and urban development, environmental protection, and natural resource management. In the early days before the UN Decade of Education for Sustainable Development (UNDESD, or “Decade”) was announced in 2002, ESD in Canada was very low in profile. Most of the work was led by LSF. In some cases, the work was integrated with ongoing global education, environmental education, and other existing like-minded initiatives.

In the late 1990s, a UNESCO Chair was formed at York University in Toronto to lead an international effort to research reorienting of teacher education to address sustainability. To run in parallel with this international initiative, a Pan-Canadian network was formed among 20 faculties of teacher education called PANCANNet. Annual meetings were held; however, no funding could be found, and for years, the organization existed primarily as a volunteer effort by member faculty and a few leaders. However, PANCANNet did provide a mechanism for core members to network, and many used PANCANNet to assist their own research and publishing

agendas. Fortunately, PANCANNet is currently being revitalized, thanks to a number of deans of faculties of education.

While a few EE leaders were opposed to ESD, many organizations began to include sustainability in their mandate, and slowly, the many “adjectival educations<sup>3</sup>” became proponents of some phase or focus of the broader ESD curricula (Jickling, 1992). Although science, health, and geography were a few of the early core curriculum subjects to embrace ESD, the senior leaders of formal education saw ESD as an additional concern beyond the core mandate. However, in general, the foci of numeracy and literacy as well as the deepening attention to accountability through increased testing and reporting kept ESD as a low priority for many educators and policy makers. Across Canada, ESD was implemented “on the ground” by a number of passionate teachers, a few visionary principals, and dedicated parents who relied heavily on volunteerism. ESD was not viewed as core curriculum and as such was not funded, timetabled, assessed, or reported.

## **ESD and Formal Education After the Beginning of the UNDES**

With the launch of the UNDES in 2005, new perspectives and opportunities for ESD emerged in Canada. As a result of the Decade, important changes occurred in the Canadian Commission for UNESCO, ministries of education, higher education, and K-12 education.

### *Canadian Commission for UNESCO*

When UNESCO was named the lead agency for the UNDES, the Canadian Commission for UNESCO (CCU) became more active and worked with Environment Canada and another important government agency, the Department of Foreign Affairs and International Trade (DFAIT), to try to develop a national strategy for the DESD. This was a difficult task as the national government has no jurisdiction over formal education and must be seen as not interfering. However, the federal departments have a role in nonformal education efforts (i.e., public awareness and training programs). To support the Decade of Education for Sustainable Development, the Canadian Commission for UNESCO organized workshops and

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<sup>3</sup>“Adjectival education” is a term coined by the late John Smyth to describe fields of education that use studies or education as part of their name (e.g., peace education or nature study). Adjectival educations are not considered core curriculum and often compete for time in the school day.

presentations at events across Canada. At a number of conferences across Canada, the CCU presented on education for sustainable development, as well as undertaking other educational and organizational roles. The CCU featured ESD as a central core theme at its own annual meeting and has sponsored ESD leaders from across Canada to attend its meetings from 2005 to the present.

### *Ministries of Education*

Another major change brought about by the Decade was the engagement of the Council of Ministers of Education of Canada (CMEC). CMEC was formed in 1967 by the provincial and territorial ministers responsible for education to provide a forum in which they could discuss matters of mutual interest, undertake educational initiatives cooperatively, and represent the interests of the provinces and territories with national educational organizations, the federal government, foreign governments, and international organizations. The CMEC represents Canada at the United Nation Economic Commission for Europe (UNECE) on educational matters. In return, the members of the CMEC are now exposed to and involved in the leadership work of the UNECE on ESD. For example, the Vilnius Framework for the Implementation of the UNECE Strategy for ESD was comprehensive, calling for regional workshops, compilation of national good practices, development of indicators, and use of a Web portal as well as coordination and review and financing (UN Economic and Social Council, 2005).

### *Revisiting the Scope and Mandate of ESD*

A third major change that resulted from the DESD was revisiting the scope and mandate of ESD, particularly at the ministerial level. After the launch of the Decade, ESD was perceived differently—more encompassing and useful. The vision of a sustainable future was accompanied by threats to national sustainability. A workforce that was unprepared for current and future jobs was one example of a threat to a sustainable Canada.

The DESD helped the ministers see that ESD was not EE revisited. It was an excellent fit with the ongoing core quests of all ministries of education: redefining “quality” education and addressing access and retention in education for all. ESD is now seen as one of ten priority initiatives for the future collaborative work of the CMEC (Council of Ministers of Education Canada [CMEC], 2008).

CMEC has included education for sustainable development (ESD) as one of the key activity areas in *Learn Canada 2020*, its framework to enhance Canada’s education systems, learning opportunities, and overall education outcomes at all levels. The specific goal for ESD is to raise students’ awareness and encourage them to become actively engaged in working for a sustainable society.

To achieve this goal, the CMEC Education for Sustainable Development Working Group was created in 2008 to:

- Coordinate action to support and strengthen the implementation of ESD in all provinces and territories;
- Develop a pan-Canadian ESD Framework for Collaboration and Action that builds on current activities for enhanced collaboration at the jurisdictional level;
- Focus on encouraging activity in the elementary and secondary system, with the integration of sustainable development into curricula, development of ESD-related teaching resources and material, and the provision of preservice and in-service teacher education and support in ESD concepts and practices; and
- Establish Canada as a leader in ESD, with this leadership demonstrated through reports on progress made toward these goals. (CMEC, n.d. a)

This new way of seeing ESD was a major breakthrough for ESD in Canada as new sectors in formal education became involved, and while those who were making the changes did not always see them as ESD initiatives, they were still making a huge difference in how the leaders saw the larger ESD program. Provinces and territories are using their own issues and initiatives to address ESD. For example, the ESD efforts of the province of Manitoba are described in Chap. 7.

### ***Higher Education***

Since 2005 there have been a number of changes in higher education as universities and colleges have recognized their leadership role in helping to reorient education systems to address sustainable development. As they have moved beyond the “Greening of the Campus” to “Greening of the Mind,” there has been a shift from conservation of utilities for cost saving to deep changes in the operations of physical plants to address sustainability concerns directly.

There have also been significant curricular changes (see Chaps. 18 and 20). New courses are being added at both the undergraduate level and graduate levels. Some explicitly deal with ESD while most campuses have relevant sustainability issues addressed within existing courses. Great progress is being made in MBA degrees, professional courses such as engineering, and even the social sciences. Teacher education is being reshaped by a resurgence of PANCANNet.

The Association of Canadian Community Colleges has long been a leader in green building management. However, Canadian universities have also responded to the pressure of student groups. Those groups are now taking a more profound leadership role incorporating sustainability into higher education programs, policies, and practices.

Today, ESD is very much a part of campus life at many Canadian colleges and universities. Initiatives are under way to assess, report, and rank institutions on such related concerns as the inclusion of sustainability in mission statements, policy documents, practices such as energy reduction, climate change initiatives, food services and recycling, green building practices, transportation, student engagement, curricula, and even investment/endowment transparency, and the handling of proxy

votes. Sustainability is now a part of the mission statement of many universities in Canada. Some universities such as the University of British Columbia plan to become carbon neutral in the near future.

## **K-12 Changes in ESD**

From the 1970s, Canada has been a world leader in its environmental, energy, antiracist, and global education programs. Sustainability-related initiatives such as Society, Environment, Education, Development (SEED), Green Schools, Eco-Schools programs, and the Brundtland Schools have been in existence for years; however, significant changes have occurred within these initiatives.

A most significant change is a shift in the perception of ESD by senior education leaders. ESD is being widely and correctly perceived as the reorientation of the whole education system to address the sustainability issues their graduates will likely face. It is no longer perceived by the ministries of education as yet another “adjectival education” add-on. The existing adjectivals are helpful components of the required reorientation process, but these “add-on” pieces are no longer seen as sufficient to create holistic education programs that address the complexity of sustainable development.

Thanks to a new program led by York University called the Sustainability and Education Academy (SEdA), education leaders are making great strides in reorienting the system to move from a “whole-school approach”<sup>4</sup> to a “whole-system approach” to ESD. The strides of the early school reformers that built upon enlightened teachers and principals have proven to be great exemplars to build upon as the senior leaders look for working policy and practice. SEdA is described more fully in Chap. 6, but the essence is as follows. In the initial program, senior leaders from school divisions, ministries of education, and faculties of education together go to a 3-day residential retreat where they work on several fronts with assistance from ESD leaders in Canada and abroad. First of all they are introduced to ESD and why it is important to them as leaders. Then, they set a goal or mission of embedding ESD into their system. Next, they analyze the current situation in their jurisdiction, addressing what is currently in place that is helpful or hurtful. Subsequently, they develop a systemic plan to reorient the system. As well, there is opportunity to present their plan to others for constructive criticism and suggestions as well as the opportunity to develop a communications strategy. Finally, this leadership training includes discussions around case studies of systems that are well down the road of reorientation.

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<sup>4</sup>A whole-school approach to sustainability is where not only classroom curriculum reflects sustainability but the activities of the school are carried out in alignment with sustainability. For example, water and energy are conserved, and equity is practiced in social interactions. Sustainability is embedded in the programs, practices, policy, and ethos of the school as well as community involvement.

Some of the most successful activities that resulted from the SEdA process are seen in the provinces of Manitoba and Saskatchewan. The Manitoba story is told in detail in Chap. 7. Manitoba took 24 steps to reorient their provincial education system, including:

1. Declaring the mission and goals of the education system as fully congruent with ESD
2. Holding SEdA programs for all senior education leaders
3. Requiring school divisions to create plans for reorienting education and operations to address sustainability for all schools within their geographic jurisdiction
4. Establishing a faculty of education ESD committee to explore embedding ESD in preservice and in-service teacher education programs
5. Making ESD a budget priority that actually expanded for in-service and exemplary programs during a time of education cutbacks

Another significant change at the K-12 level is the successful engagement of the core disciplines such as mathematics, language arts, history, and geography in ESD. This change is occurring across Canada at different rates. In Ontario, the process has been facilitated by the SEdA program. Presidents of various subject associations were invited to become involved in an existing program to use energy conservation savings as a way to embed a “Culture of Conservation” in Ontario secondary schools. The initial quest for a “Culture of Conservation” was expanded to a “Culture of Sustainability,” and the engagement of the core disciplines has proven to be successful. Each subject association was asked to form a special interest group (SIG). An abbreviated SEdA process was designed for the various SIGs. Now the SIGs are working to find the answers to two major questions: (1) how to reorient their own discipline from the current goal of human development to a goal of sustainable development that includes humans and (2) how to reorient the broader curricula to deliver their disciplines in a synergistic manner.

### ***Measuring Educational Success and Striving for Equity***

PISA (the Program for International Student Assessment) scores, which are gathered from approximately 65 countries, were recently released for 2009 (Organization for Economic Cooperation and Development [OECD], n.d.). Although much of the attention of the media was on reading, science, and mathematic scores, there were statistics that focus on other realms of schooling related to sustainability (i.e., equity). Social equity is one of the grand challenges of sustainability around the world, with countries grappling with how to assure equity in access to education for all children despite socioeconomic status, ethnic background, or race as well as freedom from discrimination once children are in school. Canada scored well on equity (Statistics Canada, 2010a).

Equity, a measure of how well a country can maximize its students' potential, was ranked as extremely high in Canada. The combination of high PISA scores with high equity demonstrates that there is a small gap between highest and lowest performing students (Canadian School Board Association [CSBA], 2010; OECD, 2004). This means that boards of education across Canada are taking seriously one of the overarching tenets of ESD—proving a quality education for all.

For example, the 2009 PISA scores showed the following outcomes for Ontario:

- Ontario students who are 15 years old are ranked in the top 5 in reading and science and the top 10 in mathematics among OECD countries.
- Ontario students in English-speaking schools who are 13 years old rank first across the country in mathematics, reading, and writing, second in science (G. Connelly, personal communiqué, July 26, 2011).

The Ontario focus on improving student reading and mathematics is resulting in good test scores. However, to alter the Ontario focus from improving student mathematics and language skill development to a focus on sustainability—building knowledge, skills, and dispositions for a more sustainable future—will take courage and dedication. Shifting from a curriculum with measureable results to another one, in which measureable outcomes are much less assured, is unsettling for many—politicians, civil servants, school leaders, teachers, and parents.

Although Canada strives to have equity as a hallmark of education across the country, underserved populations exist. Perhaps those most at risk are hard-to-serve students, which include the large numbers of indigenous youth. Partnerships are being forged by all provinces and territories to address the poor graduation rate of our First Nation students. The CMEC has identified the education of First Nations as a national priority (CMEC n.d. b). Schools for aboriginal students who live on the reservations are funded by the federal government, but the funding rate and curriculum assistance are below that for other Canadian students and remain a point of national discomfort. Aboriginal students living in small towns and remote areas often encounter difficulty when they must move to larger towns and cities to attend secondary schools. Hence, both the first thrust of ESD (access and retention to quality education) and the second thrust (reorienting existing education systems to address sustainability) are challenges for both the students and educators; however, the problem is openly discussed and efforts are being made.

## **An Uncertain Future**

Although strides are being made related to ESD, Canada is entering a crucial time. ESD is now emerging into a phase where it is taken seriously, but its future is uncertain. Research on the rate of adoption and diffusion of innovation shows a common pattern of societal acceptance across time through groups of people categorized as innovators (2.5%), early adopters (13%), early majority (34%), late majority (34%), and laggards (16%), which approximates a bell curve. At first, a few innovators



accepted new ideas. With gradual and growing acceptance, a point is reached called “critical mass” after which adoption becomes self-sustaining (Rogers, 1962, 1983). ESD is not yet at the point of critical mass, and, therefore, its future is uncertain. Fortunately, more and more Canadian educators and educational leaders are willing to become engaged in ESD. Others are watching and gathering information. As time moves relentlessly on and unsustainable practices cause further global deterioration, the need for decisive action is ever more pressing.

## Courage to Question

The senior education leaders across Canada also know the following: Their graduates (including their own children and grandchildren) will need to thrive in a world confronted with a 50% population rise and to cope while using less agricultural land, marine product, and water. Graduates will try to provide for the rest of the world with four times the energy demand (non-fossil fuel based). They will be faced with massive illegal immigration due to environmental and economic refugees. The next generation will need to learn their way forward to a more sustainable future while meeting high demands with fewer resources.

In the face of this future, Canadian education leaders and citizens today must answer difficult questions, such as “What constitutes a quality education?” and “How do we prepare our graduates for an uncertain future?” Reorienting education to address sustainability requires questioning the purpose of education and why we educate beyond knowledge and skill development for life in current society. The courage to question, to foresee the needs of life in Canada’s future, and to experiment with ESD is not totally foreign to Canadians. Manitoba and Saskatchewan are pioneers. The rest of Canada needs to learn from their successes.

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# Chapter 3

## Education for Sustainability in the K-12 Educational System of the United States

Noah Weeth Feinstein and Ginny Carlton

### Introduction

Sustainability is a newcomer to the American school system. Although it is rooted in a century of environmentalism and conservation, it has yet to find a comfortable place among the established traditions of curriculum and pedagogy. This chapter offers one account of where it came from and how it has begun to influence teaching and learning in American schools. This chapter focuses on the educational system *as a system* and seeks to provide an essential context that will enable readers to understand current directions in education research, policy, and practice.

The United States faces imposing sustainability challenges. As one of the largest economies in the world, it relies on an outdated energy and transportation infrastructure. It is also the largest per capita emitter of carbon dioxide as well as the largest per capita producer of municipal and nuclear waste. And though the United States is among the oldest continuously operating democracies in the world, it is characterized by a persistent income inequality far larger than that of most other wealthy nations. If sustainability is a struggle waged on three fronts—environmental conservation, economic prosperity, and social equity—then the United States faces challenges on every side. Education has the potential to play an important role in meeting these challenges by fostering innovation, changing behavior, and shifting political discourse in the direction of sustainability. Much of this potential has yet to be realized.

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N.W. Feinstein (✉)

School of Education, University of Wisconsin-Madison, Madison, WI, USA  
e-mail: nfeinstein@wisc.edu

G. Carlton

College of Natural Resources, University of Wisconsin-Stevens Point,  
Stevens Point, WI, USA  
e-mail: gcarlton@uwsp.edu

In this chapter, we use the phrase “education for sustainability” (EfS) rather than education for sustainable development (ESD). There is still no consensus about what we should call our field, but educators in the United States have slowly gravitated toward EfS. Many practitioners of EfS also identify strongly with the older tradition of environmental education (EE). The relationship between EE and EfS is complex. We do not think they are identical, but we also do not believe that a neat line can be drawn between them. Some authors have attempted to clarify the differences (e.g., McKeown & Hopkins, 2003), yet both fields encompass a broad range of ideologies and practices, and both are evolving, making it difficult to say what is typical for either. Despite their differences, though, there is no other educational movement in the United States that is more closely aligned with EfS than EE. Programs developed under the banner of EE have contributed enormously to programs now called EfS. Similarly, initiatives that support EfS also tend to benefit EE, and funding agencies make no clear distinction between the two fields. EE and EfS practitioners are likely to share resources and pedagogies and, in many cases, may not even see themselves as distinct groups. Finally, EfS is still a very young research field in comparison with EE. For all of these reasons, this chapter focuses a great deal of attention on EE research and practice. When we discuss these programs, we refer to them as EE, but we hope our readers will see the connections to EfS in the programs we highlight.

Our account is tightly constrained. We focus on educational programs that are closely associated with formal schooling and limit ourselves to what is generally referred to in the United States as K-12 education—shorthand for “kindergarten through twelfth grade,” the education that students receive from about 5 to 18 years of age. We do not discuss the vast territory of learning outside of schools nor do we analyze higher education. We devote some space to vocational and technical education, a sector of education that is of growing importance to education for sustainability in the United States. We also briefly refer to problems in teacher professional development. A more concerted focus on teacher education is provided in Chap. 4.

## **The Changing System**

EfS in the United States is growing slowly but steadily. Its growth has been shaped by environmental regulatory agencies at the federal level, educational regulatory agencies at the state and local level, and nongovernmental organizations (NGOs). Federal agencies have typically played a background role, supporting EfS-related practitioner networks and providing modest resources for new EfS-related projects. State and local agencies have played an enabling role, usually by releasing school- and district-level leaders from administrative constraints. Only a few states have taken a more proactive role by adopting curriculum and teacher education standards that are directly relevant to EfS. NGOs have exerted the most direct influence on EfS efforts in the US by creating and implementing EfS curricula, disseminating academic standards, and facilitating the adoption of EfS practices.

## *The National Policy Landscape*

Although there are promising signs that the US Department of Education is becoming more interested in sustainability, federal support for EfS has historically been limited and piecemeal. This is particularly true where K-12 classroom education is concerned. The first National Environmental Education Act (NEEA), passed in 1970, attempted to integrate EE content into primary and secondary education. It was poorly funded and poorly received among school administrators and was discontinued in 1975. The second NEEA, passed in 1990, conceptualized EE as a supplement to K-12 education rather than an integral part. No subsequent attempt to revive the broader terms of the 1970 legislation has secured sufficient political support to become law.

Not all federal leadership comes in the form of legislation, however. In 1993, President Clinton convened the President's Council on Sustainable Development (PCSD) in response to the international "Earth Summit" in Rio. The PCSD, which included representatives from government, industry, and nonprofit or nongovernmental organizations (NGOs), had no authority to make laws but was surprisingly successful in producing a consensus-based national vision and strategy for sustainability before it was disbanded in 1999 (Maurer, 1999).

In 1994, the PCSD sponsored the National Forum on Partnerships Supporting Education about the Environment "to broaden our concept of education to include sustainable development" (President's Council on Sustainable Development [PCSD], 1996). This forum initiated a 2-year consensus-building process resulting in the report *Education for Sustainability: An Agenda for Action*, which defined EfS as:

a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions. (PCSD, 1996)

PCSD argued that EfS should be a community-driven project, controlled and implemented by local authorities, but it also noted that "there is an opportunity for officials to address the lack of effective coordination among the educational activities of individual agencies" (PCSD, 1996). Although the report is largely forgotten, many of its observations and recommendations are as relevant today as they were 15 years ago.

Between 1999 and 2009, federal agencies continued their support for EfS, but their efforts lacked central coordination and strategy. The Environmental Protection Agency (EPA) has been the most consistent supporter of projects related to EfS. Between 1992 and 2009, the EPA gave out about 30 million dollars through its Environmental Education Division (U.S. Environmental Protection Agency [USEPA], 2009). Although this is a small amount relative to total federal expenditures on education, the EPA requires most grant recipients to find matching funds and encourages the dissemination of best practices and research findings through professional networks. This strategy has helped produce a tightly networked EE and EfS community.

Recently, there have been signs that the federal government once again wishes to take a leadership role in EfS. Following the Secretary Duncan's admission that the Department of Education had "fallen short" of the goals established in the PCSD's 1996 report (Duncan, 2010), several new initiatives were launched. Some, such as the initiative to develop green career pathways within vocational education, were clearly adjuncts to the Obama administration's "green jobs" initiative. Others, such as the extension of educational granting mechanisms to include EfS, corrected omissions in earlier policy (Duncan). Although none of these initiatives is a radical break with past policy, the Department of Education's return to sustainability is still a significant moment in the history of American EfS.

### *The State Policy Landscape*

Because state and local agencies have legal authority for education in ways that the federal government does not, their policies play a critical role in shaping educational practice in the United States. Almost all states support EfS, but the level of support varies widely. At the most basic level, many states have created state-specific networks that connect practitioners with resources and with each other. Some states, such as Minnesota, emulate the EPA by offering block grants to support EfS projects in schools and communities. A small but increasing number of states have passed laws or otherwise altered their education policies to include EfS. This is typically done by establishing content standards (as in Vermont, Washington, Wisconsin, and Maryland), changing teacher education requirements (as in Washington, Pennsylvania, and Wisconsin), or providing flexibility through charter school legislation<sup>1</sup> (as in over 40 states).

Because state EfS programs are different, and because they change constantly, it is difficult to offer an accurate account of state action on EfS. EE progress offers one imperfect proxy. Three nationwide surveys that tracked state progress relative to a hypothetical "comprehensive state-level environmental education program" (Archie, 2011; National Environmental Education Advisory Council [NEEAC], 2005) found that states are doing more than they were 15 years ago, adding initiatives to increase structural, financial, and programmatic support for EfS. Between 1996 and 2005, states collectively almost doubled the number of EE program components they provide (National Environmental Education Advancement Project, 1995, 2005). Today, 47 out of 50 states are actively developing "environmental literacy plans" (North American Association for Environmental Education [NAAEE], 2011). States that are

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<sup>1</sup>Charter schools are public primary or secondary schools, which are not subject to all of the rules and regulations that apply to other public schools. Charter schools are accountable for producing results set forth in each school's charter. Charter schools have open enrolment and are attended by choice. Charter schools are not allowed to charge tuition. State-level legislation allows or disallows establishing charter schools.

frequently cited as EfS innovators include California, Massachusetts, Minnesota, Oregon, Vermont, Washington, and Wisconsin. In Chap. 8, Gilda Wheeler offers an in-depth description of Washington State's efforts to integrate EfS into K-12 education. For the purpose of illustration, though, we offer a briefer description of Wisconsin's multifaceted approach.

In 1935, some 35 years before the first NEEA, the Wisconsin legislature passed the nation's first statute requiring the teaching of conservation in public schools. In 1985, Wisconsin's legislature passed a law requiring school boards to develop a written, sequential curriculum plan in environmental education. Wisconsin lawmakers also updated teacher certification requirements for early childhood, elementary, agriculture, science, or social studies teachers, obliging them to

demonstrate competencies in natural resources and their conservation; ecological principles; people-environmental interactions, energy in both biological and physical systems; and the use of cognitive, affective, and citizen action skills teaching methods. (Wisconsin Department of Public Instruction [WDPI], 2008)

In 1998, the Wisconsin Department of Public Instruction (WDPI) published *Wisconsin's Model Academic Standards for Environmental Education* (WDPI, 1998), which included five overall content standards as well as concrete performance indicators, and these are cross-referenced with state standards in the traditional academic disciplines. Unlike the EfS standards in Vermont and Washington, Wisconsin's standards are not legally binding, but they may still serve as a resource for educators and schools around the state.

Unfortunately, Wisconsin also illustrates the gap between ideals and reality in state-level EfS policy. Despite the state mandate, only 30% of the districts reported having an EE curriculum plan in 1992. Similarly, despite the legal requirement for teacher certification, only 46% of teachers certified in 1985 or after reported receiving preservice EE training (Lane, 1996). Unpublished survey data suggest that not much has changed since that time.

### ***The Role of Nongovernmental Organizations***

Where national and state governments have left a leadership void in EfS, NGOs have stepped in, establishing guidelines for EfS practice, advocating for EfS policy at the state level, and building capacity in schools and communities. In Vermont, the nonprofit educational organization Shelburne Farms was instrumental in organizing the community meetings that led to the adoption of Vermont's sustainability standards (Vermont Education for Sustainability, 2000) and have since played a central role in the state's EfS capacity-building efforts (see Chap. 9 for a description of one such effort). Two NGOs, the US Partnership for Education for Sustainable Development and Facing the Future, helped frame curriculum and teacher education standards for Washington State (Wheeler, personal communication, February 24, 2009). In the state of New York, the Putnam/North Westchester Board of

Cooperative Educational Services hired an NGO called The Cloud Institute for Sustainability Education to develop curriculum modules that are now used in dozens of schools.

These cases, and others like them, illustrate how NGOs exert their influence in partnership with state and local governments. Often, as in Vermont, they act as facilitators, connecting stakeholders and empowering them to exert a greater influence on policymakers. At other times, as in the state of New York, they build capacity, helping schools and educators clarify and pursue their own sustainability education goals. In a few important cases (such as the *Environmental Education Collection*, described in Sect. 3.3.1), they help document existing practices and establish standards for quality in EfS (NAAEE, 2004b). Behind some of these efforts is the indirect support of the federal government, which offers grant funding to educational NGOs. More direct support is also provided from the private sector in the form of grants from philanthropic foundations and industry.

## Changing Practices

Like the complex and ever-changing landscape of state policy, the hardwork of EfS practitioners is difficult to document or summarize. The United Kingdom (Huckle, 2009) and countries such as Germany (Rode & Michelsen, 2008) have started to develop comprehensive systems to monitor EfS, but so far, there is no indication that the United States will follow. This is unfortunate because many of the most compelling examples of EfS emerge from schools and classrooms where dedicated practitioners have adopted, adapted, or created programs to suit local conditions. It is possible, however, to offer a general picture of innovation and change in the United States EfS by focusing on three overlapping aspects of EfS in the K-12 system: curriculum, pedagogy, and whole-school projects.

## Curriculum

In the United States, curriculum reform often proceeds through an unplanned “push-pull” process, in which the content of instruction is shaped by legislative “pushes” from state and local government and “pulls” in the form of resources from independent curriculum developers. This process is a consequence of the relative autonomy that most teachers have in choosing what to teach. Working within the constraints of federal, state, and local curriculum standards, teachers often choose to adapt existing curriculum materials rather than develop their own—particularly when they lack confidence in a subject they are required by law or driven by principle to teach.

Teachers who wish to integrate EfS into their classrooms can choose among curriculum resources produced by university-based research groups, for-profit



companies, and NGOs. Some of these resources, such as the water education materials produced by Project WET, have reached millions of children in the United States and other countries. The diverse array of resources presents a challenge in its own right: teachers must choose from a bewildering selection of materials. Many organizations attempt to assist teachers by collecting and indexing EfS-related resources. The most ambitious such attempt is *The Environmental Education Collection: A Review of Resources for Educators*, a peer-reviewed collection established by the North American Association for Environmental Education (NAAEE) (2004a).

It remains to be seen how useful *The EE Collection* and other such resources will be for EfS practitioners in the years ahead. Many curricula labeled “environmental education” focus more narrowly on issues of environmental conservation and do not fit commonly used definitions of EfS. In particular, many of the most prominent curricula do not deal with issues of social equity. Although there has always been a thread of concern for equity and social justice within the broader field of environmental education (e.g., Cole, 2007), social and environmental justice are rarely a central focus of mainstream EE (Kushmeric, Young, & Stein, 2007).

One of the most exciting areas of growth in EfS, and one that is often overlooked in the literature, is career and technical education (CTE). In new and promising CTE curricula, such as the Sustainable Design Project led by the Department of Education in Washington State, older K-12 students work in teams to find solutions to wide-ranging sustainability challenges, drawing on assistance from nearby universities and the private sector (Washington Office of Superintendent of Public Instruction, 2011). The federal government has also become involved in sustainability projects for CTE by supporting the development of five replicable program models in five different states (Kanter, 2010). It remains to be seen whether these programs will successfully integrate technology and entrepreneurship with other sustainability concerns, but the growing availability of curriculum materials in CTE is an important step forward.

## ***Pedagogy***

By some measures, EfS (or at least the environmental component of it) is quite common; in 2005, Coyle reported the results of a nationwide survey showing that “nearly half of all K-12 teachers indicate they teach Environmental Education during the school year.” At the same time, most of the teachers surveyed spent little time on environmental topics, and little data are available for the topics they taught or the pedagogical strategies they used (Coyle, 2005, p. 68). Based on the number of teachers who are reported to use ready-made curriculum resources, it is reasonable to assume that many teachers use prepackaged materials. Many others may rely on informal educators who work with schools on a contract basis.

Prepackaged curriculum materials are not the whole story, however, and two older pedagogical models from environmental education foreshadow a contemporary

trend toward EfS that is grounded in local sustainability concerns. Although many other models could have been selected, these two are unusually well documented in the research literature. The first model, Investigating Environmental Education Issues and Actions (IEEIA) is based on the behavior change theories of Harold Hungerford and Trudi Volk. It is “designed to help learners take an in-depth look at environmental issues in their community, to make data-based decisions about those issues, and to participate in issue resolution” (Volk & Cheak, 2003, pp. 12–13). Students participating in IEEIA programs identify environmental problems that matter to them, set goals, and work together to first investigate and then address these problems. Along the way, they systematically collect and analyze data through surveys and questionnaires.

IEEIA is among the most thoroughly documented pedagogical strategies in environmental education. Over a dozen papers have examined IEEIA programs in many separate locations over 20 years. This body of research is methodologically imperfect,<sup>2</sup> but the uniformly positive results—changes in attitudes, knowledge, and behavior—are still impressive (Hungerford, Volk, & Ramsey, 2000; Volk & Cheak, 2003).

Environment-Based Education<sup>3</sup> (EBE) is another distinct pedagogical movement that takes a more discipline-oriented approach. EBE pedagogy is described as “interdisciplinary, collaborative, student-centered, hands-on and engaged” (National Environmental Education and Training Foundation [NEETF], 2000). The truly distinctive feature of EBE, however, is cross-curricular integration: in the archetypal EBE unit, teachers from multiple disciplines coordinate their planning so that students repeatedly address a complex and compelling environmental problem using different disciplinary tools as they travel from class to class.

Although the sustainability-related outcomes of EBE are unknown, its effect on achievement in the disciplines is impressive. When compared to students in demographically similar schools, students in schools or within-school programs implementing EBE demonstrated higher achievement in subjects such as social studies, mathematics, and science; their reading scores also improved, sometimes dramatically (Lieberman & Hoody, 1998). There are conspicuous weaknesses in the methods used to study EBE, but the documented effects are large and have been supported by more recent quantitative and qualitative research (Athman & Monroe, 2004; Falco, 2004; NEETF, 2000).

Both IEEIA and EBE are defined in terms of environmental themes and outcomes and therefore focus on only one aspect of sustainability. On the other hand, the key elements that define these two pedagogical models have become central to more recent forms of American EfS. In particular, the focus on interdisciplinary, student-centered instruction and the attention given to authentic sustainability challenges are increasingly characteristic of EfS initiatives in the United States. One of the most visible of these is place-based education.

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<sup>2</sup>Most studies relied on post-only comparisons between intact groups and inadequately established the comparability of comparison groups.

<sup>3</sup>EBE is also referred to as EIC: Environment as an Integrating Context™.

Place-based education (PBE) is historically connected to EBE, but it is framed in terms of sustainability. *The Promise of Place*, an online clearinghouse for relevant materials, evokes prominent international definitions of EfS when noting that PBE “fosters vibrant partnerships between schools and communities to both boost student achievement and improve community health and vitality—environmental, social, and economic” (Promise of Place, 2009). PBE researchers have focused on a broad set of outcomes, including improved community-school relationships, stronger collaboration between teachers, and improved outcomes for students with special needs (Powers, 2004). Most recently, Duffin, Murphy, and Johnson (2008) have taken the first step toward demonstrating a connection between PBE programs and local environmental quality.

PBE is representative of a larger trend toward school-community collaboration in EfS. School gardens are one obvious manifestation of this trend. Although schools have used gardens as learning environments for over a century, the number of school gardens is increasing, as is the willingness of teachers and schools to integrate gardens into every aspect of their operations, from food preparation to curriculum design, often with explicit sustainability goals (Dillon, Rickinson, Sanders, Teamey, & Benefield, 2003; Ozer, 2007). School gardens are especially common in elementary schools, which often lack staff time or appropriately trained staff and must rely on community partners to develop their garden programs.

### ***School-Level Projects***

School gardens are only one of the ways in which schools, rather than individual teachers, undertake EfS. Compared to its minimal classroom presence, EfS is surprisingly prominent in whole-school reform efforts. Hundreds of schools around the United States have instituted reforms based on what they identify as sustainability principles. Many of these schools, often called “sustainable schools” or “green schools,” are private or charter schools. Relatively independent of public school networks, they participate in networks such as the Green Schools Alliance (GSA) and the National Association of Independent Schools that support their sustainability-oriented programming. Public schools that adopt sustainability principles usually do so as part of district or regional initiatives. Statewide networks of public schools with a sustainability focus can be found in states such as Vermont, Oregon, California, and New Jersey.

Both the national networks for independent schools and statewide public school networks attempt to leverage local expertise and educational resources (often from NGOs) to enhance school-based EfS. Some networks, such as the National Association of Independent Schools, encourage their members to include a wide range of concerns, from energy efficiency to demographic diversity, in their sustainability programming (Bassett, 2005). Other networks, such as the Green Schools Alliance, take a narrower but more aggressive stance. To become members of the GSA, schools must commit to monitoring and reducing

their carbon footprints—though this narrow goal is intended to be the core of a more comprehensive effort to engage students, teachers, and administrators in sustainability-related projects (Green Schools Alliance, 2009).

Many whole-school EfS programs begin with “green” building and energy-use practices. For example, the New York City Department of Education requires all public schools in New York City to appoint a sustainability coordinator. These coordinators are primarily responsible for resource and energy conservation but are also expected “to be the conduit for sustainable curriculum development initiatives” (New York City Department of Education, 2011). Most research on green schools has focused on their health benefits to students and staff (Board on Infrastructure and the Constructed Environment, 2006). A small number of studies have begun to suggest that sustainably designed buildings also have positive academic, attitudinal, and behavioral effects (e.g., Edwards, 2006).

## Challenges and Questions for the Future

Despite clear progress, especially in the last few years, EfS is still a marginal part of US K-12 school system. In the previous sections, we outlined some of the recent positive changes and offered a few concrete examples of EfS in US schools. In this, the final section, we briefly outline three overarching challenges that American EfS currently faces. These challenges concern the audience, institutionalization, and goals of EfS.

The audience challenge can be boiled down to a single question: Who is EfS for? EfS, like EE, is at risk of becoming an educational luxury, available primarily to privileged groups within American society. This is a natural consequence of a public education system that faces entrenched inequality and has other educational priorities. Private and independent schools, as well as high-resource, high-performing public schools, face less testing pressure and can afford to invest in curricula and pedagogy that reach beyond the academic core. Resource-poor schools with poor test scores—schools that serve a disproportionate number of ethnic, cultural, and language minority students—are forced to eliminate EE and EfS, along with anything else that is not on state performance tests. It could be argued that the best way to ensure curriculum coverage of EfS would be to include EfS in high-stake assessments, something that presents enormous practical and ideological challenges.

Assessment is only one aspect of the second challenge facing EfS—institutionalization. In the United States, as in other countries, the growth of EfS is hampered by lack of space in the curriculum, time in the school day, and, perhaps most importantly, lack of capacity among educators (Feinstein, Jacobi, & Lotz-Sisitka, *in press*; Nolet, 2009). Although some states are beginning to establish EfS standards and teacher certification requirements, Wisconsin’s example demonstrates that legislation may have a limited effect on practice.

Underlying both of these challenges are profound conceptual questions about the goals of school-based EfS. Other chapters in this book discuss the goals and

conceptual foundations of EfS within their local contexts. We do not wish to repeat their arguments here. Still, we would be remiss if we did not point out that all of the most exciting areas of growth for EfS, including curricula on green design and entrepreneurship, pedagogies of place-based education, and the emergence of new school-community partnerships, raise critical questions about the goals of EfS. How do we balance the convergent but distinct goals of changing behavior, transforming our economy, and preparing citizens? How can we best measure our success? Can nations and states set EfS standards, or is sustainability an irreducibly local concern? These are not new questions, but the growth of EfS means we must acknowledge and address them.

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**Part II**  
**Teacher Education**



## Chapter 4

# Teacher Education and ESD in the United States: The Vision, Challenges, and Implementation

Victor Nolet

Teacher-education institutions can play a critical role in the work of reorienting education systems at all levels to address sustainability. As the primary source for the preparation of new teachers and delivery of professional development and advanced degrees for veteran teachers, teacher-education programs exert a major influence on the education that is delivered in schools. In the United States, there are more than 1,400 teacher-education institutions, and approximately 90% of all new teachers are prepared at one of those programs (American Association of Colleges for Teacher Education, 2011). The potential influence of teacher-education programs becomes evident when one considers that there are approximately 3.7 million K-12 teachers in US classrooms today, and the National Center for Educational Statistics (2011) projects that, by 2017, there will be 4.2 million teachers working in public school classrooms. Most of those additional teaching positions will be filled by newly certified teachers.

Teacher-education programs generally are housed as academic units within larger colleges or universities, and as members of the academy, teacher-education faculty members contribute directly to the creation and dissemination of new knowledge through research and publication activities. Furthermore, teacher preparation usually involves faculty in the arts and sciences and humanities, so that teacher education at many institutions is a campus-wide endeavor.

In addition to their contribution to scholarship, teacher educators in the United States frequently participate directly in the development of state education policy by serving on policy advisory committees and oversight boards as well as by testifying at legislative hearings. Similarly, national education organizations of which teacher educators are members, such as the *American Association of Colleges for Teacher*

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V. Nolet (✉)

Woodring College of Education, Western Washington University,  
Washington, DC, USA

e-mail: victor.nolet@wwu.edu

*Education and the American Educational Research Association*, exert significant influence on national policy and state policy agendas.

Education for sustainable development (ESD) is not yet a prominent feature of teacher education in the United States. However, in pockets of innovation around the country, teacher educators have begun to address ESD in the preservice and advanced professional development of teachers. Viable strategies and models for integrating ESD into the professional development of teachers exist in the United States today and serve as tangible proof of the viability of a transformed US teacher-education system that addresses sustainability.

This chapter explores a vision for bringing about broader inclusion of ESD in the professional development of teachers in the United States. It draws upon the knowledge developed in the international movement in ESD as well as recent research focusing on the characteristics of effective teacher preparation in the United States. It also identifies program design and implementation strategies that appear to have been successful in US teacher-education programs already addressing ESD. However, any discussion of a transformed teacher-education system must be tempered with a frank assessment of the contextual realities of teacher education in the United States today, so that is where this chapter begins.

## **The Context of Teacher Education in the United States**

Today, the fundamental assumptions that have informed teacher education for most of the last century are being challenged by critics from outside the profession as well as by new research findings from within (Grossman, 2008; Hess, 2009), and all aspects of teacher education are being called into question, including the structure, curriculum, goals, and outcomes. Preservice campus-based courses are being replaced by extended field placements, while the efficacy of so-called general methods classes continues to be challenged as these courses are replaced by discipline-specific pedagogy classes that address pedagogical content knowledge (Bullough, 2001; Mirel, 2011).

Traditional university-based programs exist side by side with a wide range of innovative and at times controversial approaches including school district-operated credentialing programs and a wide variety of “alternative routes” to certification (Dai, 2007; Zeichner & Conklin, 2005). At the same time, university-based “bricks-and-mortar” preparation programs are finding that they must now compete with online colleges fully approved by state education agencies to offer courses leading to licensure (Zeichner, 2006). The long-term viability and efficacy of internet-based programs are not yet known; however, the continued growth of online teacher-education programs is probably inevitable.

### ***Teacher Education and Public School Reform***

Teacher education in the United States is inseparable from the larger context of public preK-12 education (i.e., preschool, kindergarten through twelfth grade), so it

is impossible to understand the transformation underway in teacher education without examining preK-12 education. Public schools in the United States are still based largely on early twentieth-century concepts of workforce development and centralized administrative control. Early twentieth-century school reformers sought to impose economic notions of efficiency on the education sector (i.e., greater output with no additional input of resources) through standardization of nearly every aspect of schools including buildings, curricula, professional credentialing, and administrative functions. This was a flawed policy strategy that preserved the inequities present in the US economy and society at the height of the Jim Crow era and women's suffrage movement. A century later, those structural problems still exist in the US education system, and today, the single most salient characteristic of the United States education system may be its inequity (Children's Defense Fund, 2011; Wilkinson & Pickett, 2009).

Access to the benefits of an adequate public school education is highly dependent on family income, race, and language. As a result, some children in the United States experience a publicly funded education that includes access to state-of-the-art technology, highly skilled and experienced teachers, a broad choice of curricular offerings including Advanced Placement (AP) and International Baccalaureate (IB) courses, and a diverse palette of extracurricular offerings. At the same time, a large segment of children in the United States experience a publicly funded education in poorly equipped buildings in disrepair, outdated curriculum materials, and access to only the most rudimentary educational technology. Often, the least well-prepared teachers are disproportionately assigned to teach the least advantaged students in high-minority and low-income schools (National Commission on Teaching and America's Future, 1996).

Inevitably, these inequities result in lower achievement and diminished opportunities for students from disadvantaged backgrounds while preserving the privileged status of students from middle-class and wealthy families. The impacts of these inequities are simply devastating. According to the *State of America's Children* report issued by the Children's Defense Fund (2011):

- Nearly 80% or more of Black and Hispanic public school students in the fourth, eighth, and twelfth grades are unable to read or to complete math problems at grade levels compared to 50% or more of White children.
- Black students are suspended from school more than three times more often than White or Asian/Pacific Islander students and two times more often than Hispanic students.
- Thirty-five percent of Black and 29% of Hispanic high school students attend one of the more than 1,600 "dropout factories" across the country. These are schools where 60% or fewer of the students in any given ninth grade class will graduate in 4 years with a regular diploma.
- The average graduation rate for Black and Hispanic students is just over 60%, compared with 81% for White and 91% for Asian/Pacific Islander students. This pattern exists in 13 states.
- Approximately two-thirds of the individuals in the juvenile justice system are youth of color.

- Black youths are arrested for violent offenses more than three times more often than youth in all other groups.
- An average of 12% of Hispanic and 19% of Black people aged 25–29 years old are likely to graduate from 4 years of college, compared with 31% of White people the same age.

Embedded in this alarming scenario is the fact that the US preK-12 teaching force as well as the faculty of many teacher-education programs is overwhelmingly White, female, middle class, and suburban (Aud et al., 2011; Sleeter, 2001). Teachers of color represent only about 16% of the US teaching force and about 21% of beginning teachers (Aud et al.). Yet the US school-aged population is becoming increasingly more linguistically, culturally, ethnically, and economically diverse, resembling more than ever the characteristics of the rest of the world. Today, about 45% of public school students are students of color (Aud et al.).

As public impatience with the inadequacy of US schools has grown, calls for education reform have increasingly targeted teacher-preparation programs. For example, during the early 2000s, changes in federal legislation authorizing funding for higher education institutions (Title II of the Higher Education Act) were tied to the accountability requirements of the elementary and secondary education funding legislation known as No Child Left Behind. To receive federal funds under these two programs, states were required to impose stringent assessment and reporting requirements on teacher-education programs. Today, teacher candidates often are required to pass tests of general knowledge and content pedagogical knowledge to be admitted to teacher-education programs or to be eligible for student teaching.

In many states, teacher-education candidates also are required to pass a performance-based assessment at the conclusion of student teaching (Chung, 2008). For example, the *Teacher Performance Assessment* (TPA) is currently being piloted in 21 states and more than 100 teacher-preparation programs. The *Teacher Performance Assessment* is based on the highly successful *Performance Assessment for California Teachers* (PACT) and consists primarily of a multiple measure assessment system documenting teaching and learning in 3–5-day learning segments for one class of students. In a number of states, teacher-education programs are required to report pass and fail rates on these various assessments to state education agencies as well as to the US Department of Education.

### ***Impacts of the Economic Recession***

Of course, this entire discussion of school reform takes place against the backdrop of the worldwide economic recession that has persisted since the fall of 2008. The nonpartisan Center on Budget Priorities reported that in fiscal year 2012, 38 states made deep, identifiable cuts in K-12 or higher education spending, in most cases spending less than they did in 2008, even though school enrollments have steadily increased during that time. Many public colleges and universities were forced to

increase tuition, sometimes by as much as 15% in 1 year to make up the difference. Tight budgets and changes in financial aid and federal funding formulas also prompted colleges and universities to impose stricter “time to degree” requirements to ensure that students are able to complete a baccalaureate degree within 4 years. Students who fail to complete a bachelor’s level degree within 4 years may lose eligibility for financial aid. As a result, colleges and universities are more closely scrutinizing program degree requirements.

## **Challenge or Opportunity?**

One might despair at the difficulty of envisioning a strategy for reorienting teacher education to address sustainability when teacher education is experiencing rapid structural changes, when public satisfaction with education institutions is historically low, and when tight budgets and stringent accountability requirements have reduced curriculum flexibility. However, the turbulent and rapidly changing context of education in the United States today is part of the tectonic economic, social, and political changes underway in society at large. There is a growing consensus that teacher education cannot simply react to societal and economic trends but must become a driver of social and economic change (Apple, 2011; Caillier & Riordan, 2009; Darling-Hammond, 2011; Wang, Lin, Spalding, Odell, & Klecka 2011). The uncertainties that surround preK-12 public education in the United States may be precisely the context in which the new type of thinking that is ESD can take root.

One need not think of ESD as something new that needs to be shoe-horned into an overcrowded teacher-education curriculum. Instead, it can provide strategies for addressing the challenges teacher education faces today. The remainder of this chapter will present a discussion of four elements of a vision for teacher education reoriented to address sustainable development. Those elements directly address the current context of teacher education today and at the same time represent the core dimensions of ESD discussed in Chap. 1.

## **Reorienting Teacher Education to Address Sustainable Development**

The four thrusts of ESD (improving basic education, reorienting existing curricula, developing public awareness, and workforce training) described in Chap. 1 form the overarching framework for the reorientation of the US teacher-education system. As the discussion in Chap. 1 emphasizes, those four priorities must be implemented through the filter of local and cultural relevance.

The importance of local relevance becomes clear in the context of teacher education in the United States. There can be no “one size fits all” model that will work in

every program. Teacher-education programs across the country vary tremendously as each program reflects the goals and mission of its parent institution, the philosophical and pedagogical orientation of program faculty, state credential requirements, the needs of local stakeholders including teacher candidates and local schools and their surrounding communities.

The international movement in ESD is beginning to provide research-validated information about program elements, pedagogy, and quality indicators that can be applied in US teacher-education programs, regardless of local program characteristics. In a report commissioned by UNESCO as part of the ongoing program to monitor the impacts of the United Nations Decade of Education for Sustainable Development (DESD), Tilbury (2011) identified specific learning processes that underpin successful ESD initiatives. Those processes are:

- Collaboration and dialogue, especially processes that encourage the participation of multiple stakeholders as well as intercultural dialogue.
- Holistic or “whole system” approaches that entail transformation of the curriculum, schools, communities, and families.
- Innovation in the curriculum as well as in teaching and learning experiences.
- Active and participatory learning.

Tilbury (2011) noted that successful ESD projects involve more than conveying new knowledge but also involve learning to ask critical questions, clarifying one’s own values, envisioning more positive and sustainable futures, thinking systemically, responding through applied learning, and exploring the tensions between tradition and innovation.

Tilbury’s findings bear remarkable resemblance to findings from research about the characteristics of successful teachers and teacher-education programs in the United States. Successful teachers are critical thinkers, have effective collaboration skills, reflect on their own impacts on student learning, and are skilled at balancing innovation with established practices (Bransford, Darling-Hammond, & LePage, 2005; Cochran-Smith & Zeichner, 2005; Darling-Hammond, 2011; Fraser, 2010). This degree of concordance of the ESD and teacher-education research creates a clear pathway for reorienting teacher education to address sustainability.

Recognizing the critical role of teacher-education institutions in reorienting the world’s education systems to address sustainability, UNESCO established the UNITWIN<sup>1</sup>/UNESCO Chair on Reorienting Teacher Education to Address Sustainability at York University in Toronto, Canada, in 1999. The Chair convened an *International Network* of Teacher Education Institutions (TEIs) that now includes members from more than 60 countries and has met biennially since 2000. In 2005, UNESCO published the *Guidelines and Recommendations for*

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<sup>1</sup>UNITWIN is the abbreviation for the University Twinning and Networking Programme. The UNITWIN/UNESCO Chairs Programme seeks to advance research, training, and program development by building university networks and encouraging interuniversity cooperation through the transfer of knowledge across borders.

*Reorienting Teacher Education to Address Sustainability* (UNESCO, 2005) which was prepared by the Chair, Charles Hopkins; Secretariat, Rosalyn McKeown; and members of International Network.

The *Guidelines and Recommendations* document is a blueprint for reorienting teacher-education programs worldwide to address sustainability and illustrate that there are many ways to address sustainability in teacher education. The TEIs in the International Network addressed a wide variety of issues and initiatives under the broad rubric of ESD. Concomitantly, “on the ground” implementation of these guidelines in teacher-education programs in the United States would vary according to local program and community characteristics.

However, the complex context for teacher education in the United States described in the first section of this chapter as well as the lessons learned from the *International Network* suggest that there is a set of core strategies for reorienting teacher-education programs to address sustainable development. Those strategies are:

1. Focus on improving outcomes for all students.
2. Embed ESD in the process of learning to be a teacher.
3. Use existing structures, processes, and local resources.
4. Provide professional development for faculty and administrators.

### ***Focus on Improving Outcomes for All Students***

Consistent with the first priority of education for sustainable development (ESD) of improving basic education, teacher-education programs in the United States must first and foremost seek to address the significant inequities in the US education system and particularly to improve educational outcomes for poor and minority children. The goals of promoting a more sustainable and just society in the United States cannot succeed as long as a large proportion of children are systematically denied the benefits of an adequate education.

As McKeown (2002) emphasizes, the recognition of the need for quality education sets education for sustainable development apart from other educational endeavors such as environmental education or economic education. Those interested in reorienting teacher education to address sustainability must come to view this issue as equal in importance with other aspects of sustainable development such as reducing CO<sub>2</sub> emissions, preserving wilderness areas, promoting gender equity, supporting local economies, or promoting biodiversity. Clearly ensuring that all children in the United States have access to an adequate education is fundamental to the ideal of meeting the needs of the current generation while making sure future generations can meet their needs.

While teacher-education programs cannot be expected to fix the deep structural flaws in the US education system that create inequities, there are a number of strategies for helping teachers become better prepared to meet the needs of all students in their classrooms.



These strategies are generally associated with helping teachers develop a culturally responsive teaching practice (Banks et al., 2005; Sleeter, 2001), meeting the needs of English learners (Garcia, Beatriz Arias, Harris Murri, & Serna, 2010) and differentiating instruction for students with diverse learning needs (Tomlinson, 2001). The research investigating the efficacy of these approaches consistently has shown that teacher-preparation programs can help prepare prospective teachers to teach poor and minority as well as English language learners successfully. The programs that have been most successful in this work have a number of common features as summarized by Garcia et al. (2010):

- The curriculum is grounded in the knowledge of child and adolescent development, learning, social contexts, and subject matter pedagogy, taught in the context of practice.
- Extended clinical experiences are carefully developed to support the ideas and practices presented in simultaneous, closely interwoven coursework.
- Explicit strategies to help students confront their own deep-seated beliefs and assumptions about learning and students and learn about the experiences of people different from themselves (p. 135).
- A common, clear vision of good teaching permeating all coursework and clinical experiences.

In addition to providing teacher candidates with opportunities to learn strategies aimed at creating culturally responsive, inclusive classrooms, teacher-education programs need to aggressively recruit members of underrepresented groups into the profession. Strategies for increasing the diversity of the teaching force include options such as creating pathways for paraprofessionals to enter programs, partnerships with community colleges that serve minority communities, and exploration of alternative route preparation programs that better serve the needs of career and place-bound students. At the same time, mentoring and peer-support programs aimed at helping first-generation college attendees navigate the complexities of college can help teacher-education recruits from underrepresented populations stay enrolled and eventually graduate from teacher-preparation programs.

### ***Embed ESD in the Process of Learning to Be a Teacher***

As the examples in the *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* (UNESCO, 2005) illustrate, teacher-education programs in the United States will each implement ESD in locally relevant ways, based on the values and goals of the program. However, it will be important for teachers prepared in those programs to develop a thorough understanding of sustainability and the strategies associated with ESD. More to the point, teacher-education programs should avoid selectively privileging one sphere, such as the environment or social justice, over a more interconnected view of sustainable development. It is this interconnected perspective that distinguishes ESD from the various adjectival education programs (see Chap. 1).

The more formal notion of sustainable development as a process that balances human and economic well-being with cultural traditions and the health of the earth's



natural systems is a complex and potentially difficult idea to teach. Moreover, sustainable development is highly contextual, and the idea of “development” can be difficult to understand for individuals living in the United States. However, there are a number of “portals” through which teachers can pass to gain a more complete understanding of the complexity of sustainability. These are issues or topics that provide an opportunity to examine the interconnectedness of the core ideas associated with sustainability: society, environment, and economy.

For example, the teacher-education program *Teaching for a Sustainable Future: A multimedia teacher education programme* (UNESCO, 2010) identifies a number of global issues that can serve as curriculum foci for exploration of sustainable development. Those global issues include:

- Culture and religion for a sustainable future,
- Indigenous knowledge and sustainability,
- Women and sustainable development,
- Population and development,
- Understanding world hunger,
- Sustainable agriculture,
- Sustainable tourism,
- Sustainable communities.
- Globalization, and
- Climate change.

Similarly, Nolet (2009) identified nine thematic topics that would be part of a “sustainability-literate” teacher’s knowledge base:

- Intergenerational perspective,
- Environmental stewardship,
- Social justice and fair distribution,
- Respect for limits,
- Systems thinking and interdependence,
- Importance of local place,
- Economic alternatives,
- Nature as model and teacher, and
- Global citizenship.

Teacher-education programs interested in addressing sustainable development should look for ways to include these portals in required coursework, field experiences, or cognate and prerequisite courses. Some specific program-design strategies for doing so are addressed in the next section of this chapter.

In addition to addressing the conceptual elements of sustainable development, it is also important that teacher-education programs provide opportunities for candidates to develop what might be thought of as *pedagogical content knowledge* associated with sustainability. Teachers need to know when and how to integrate ideas associated with sustainable development into lessons and units, how to model practices associated with sustainability, and how to link sustainable development ideas to other aspects of student learning (e.g., literacy, numeracy, and metacognitive strategies). Equally important, teachers need to learn how to convert sustainability-based

pedagogical content knowledge into “high-leverage practices” (Lampert, 2010) that lead to comparatively large advances in student learning. This can be used to address common problems of practice that teachers encounter regularly and that novices will need to employ once they begin teaching.

For example, McClanahan (2010) describes a process for using first-person narratives pertaining to climate change to help native Alaskan students develop literacy skills. Similarly, Carney (2011) described a study in which four teacher candidates placed in a year-long internship in an elementary school with a garden learned to teach for sustainability. She found that the factors that could increase or decrease the likelihood of preservice teachers incorporating sustainability-related content into their practice included method courses that model appropriate strategies and materials, field placements where sustainability principles are enacted, and content standards that target higher-level thinking and the application of learning.

### *Use Existing Structures and Processes*

Given all of the forces currently acting upon teacher education, it would be a fool’s errand to attempt to radically change teacher education to address sustainability. A more sensible approach is to look for ways to address existing programmatic problems and needs by employing knowledge and strategies associated with sustainability. This approach is dependent on use of existing structures, processes, and local resources. Structures can include existing organizational and curriculum structures such as departments, programs, courses, degrees, or field experiences. Processes can include a variety of administrative and academic processes including program approval and accreditation, tenure and promotion, or travel authorization as well as on-campus resources such as the campus sustainability committee or faculty in other colleges.

### **Certificate Programs**

A number of TEIs in the United States have begun integrating ESD into the preservice and in-service programs by adapting or slightly modifying existing program structures. For example, West Chester University recently developed a 12-credit, four-course certificate in ESD. Such certificate programs usually require a low level of institutional or state approval and can be operated as self-supporting summer courses or electives, thereby incurring little additional expense to the institution. Although adding a certificate sequence can increase a teacher candidate’s “time to degree” and may have limited value for prospective teachers in the job market, they can serve as a first step for program planners interested in eventually building an academic degree program in sustainability.

### **Sustainability Concentration**

A more robust approach to including ESD in the preparation of teachers involves offering a sustainability concentration within an existing graduate degree program. For example, in addition to a certificate, Webster University's Education for Global Sustainability program is available as a concentration in the Master of Arts in Teaching (MAT) degree.

### ***State Endorsement and Certification Requirements***

A more “upstream” approach for reorienting teacher education to address sustainability involves changes to the licensure that all teachers must acquire to be eligible to teach in a particular state. Often, teacher-education programs are able to exert considerable influence on the process of establishing new specialized license elements, such as special endorsements or on the core elements of the basic license itself, often referred to as “certification.”

### **Certification**

In Washington, similar to many other states, teacher-education programs are approved by the Professional Educator Standards Board. Program approval of TEIs is guided by standards addressing a variety of program features, including standards pertaining to the knowledge and skills teacher candidates must acquire. As Wheeler describes in Chap. 8, Washington now requires that beginning teachers are able to prepare K-12 students “to be responsible citizens for an environmentally sustainable, globally interconnected, and diverse society” for basic certification. As a result, all 21 state-approved teacher-education programs in Washington are now required to address ESD in the preservice programs. Teacher-education programs have approached this task in a number of ways, including infusion of sustainability-related content into existing classes as well as through field experiences or specialized field projects.

### **Specialty Area Endorsement**

In 2009, the Washington Professional Educator Standards Board, which oversees all aspects of teacher preparation and licensure, approved a new specialty area endorsement in Environmental and Sustainability Education. This endorsement is available to any licensed teacher in Washington at any grade level. A number of TEIs in the state have begun offering the endorsement, and others will follow shortly.

## **Accreditation of TEIs**

The accreditation process for TEIs also offers an opportunity for introducing ESD into the preparation of teachers. Under the new CAEP<sup>2</sup> accreditation process, teacher-education programs will have the option of pursuing transformative initiatives aimed at self-improvement, reform of the teaching profession or learning in preK-12 schools, and research. This transformative initiative route offers programs a powerful strategy for addressing ESD as a systemic, college-wide process.

### ***Provide Professional Development for Faculty and Administrators***

ESD represents a new way of viewing the preparation of teachers and school administrators. It involves specific knowledge as well as dispositions that entail professional and personal engagement with complex sustainability issues. The process of reorienting teacher education to address sustainability must include opportunities for teacher-education faculty and administrators to gain knowledge and experience with the core propositions and knowledge base involved in sustainable development.

Any efforts to provide professional development must attend to the unique professional contexts in which teacher educators operate, both as members of the teaching profession and as members of the academy. Information provided to teacher educators will need to be highly credible, research validated, and embedded in the context of their work. Generally, teacher-education faculty will want to direct their own learning process through self-directed inquiry or research.

Strategies that have the potential for success include:

- Allocating funds for faculty to attend sustainability-related conferences, symposia, or meetings.
- Providing incentives for faculty to engage in scholarship related to ESD.
- Establishing a faculty fellows program that provides financial and time support for faculty to participate in peer study groups.
- Establishing a visiting scholars program that provides opportunities for faculty members to interact and work with scholars in sustainability-related fields.
- Providing incentives and supports for faculty to participate in sustainable development projects around the world, particularly those focused on teachers and schools.
- Providing supports for faculty to develop new courses or programs addressing ESD.

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<sup>2</sup>Recently, the Teacher Education Accreditation Council (TEAC) and the National Council for the Accreditation of Teacher Education (NCATE) merged, and the new organization is called the Council for the Accreditation of Educator Preparation (CAEP).

- Encouraging faculty to participate in campus sustainability efforts.
- Developing partnerships with local schools and community groups focusing on sustainability initiatives and providing incentives for faculty to participate.

## Concluding Remarks

The term “paradigm shift” has been overused and frequently misunderstood since Kuhn (1996) first applied the idea to the periodic transformations in scientific reasoning that have occurred throughout history. However, it is apparent that a paradigm shift is now underway as humanity begins to come to terms with the absolute finitude of our planet. Life during a paradigm shift can be confusing, contentious, and uncertain, and this certainly describes the state of teacher education in the United States today.

Education systems in the United States are deeply mired in “old paradigm thinking” that embraces belief in unlimited-growth economic models, natural systems that exist outside of the laws of thermodynamics, and an irrational faith in entitlement and privilege. Education for sustainable development represents “new paradigm thinking” that embraces recognition of limits, systems interconnectedness, and a commitment to equity and human development.

This paradigm shift presents US teacher-education institutions with a crucial decision—hold fast to the status quo of old paradigm thinking or lead the way toward sustainability. The choice is clear. The old paradigm offers only a Procrustean bed of regulation, standardization, decreasing relevance, and inevitable obsolescence. The new paradigm offers uncertainty and discomfort, but it also offers something else—the possibility of transformation.

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## Chapter 5

# Preservice Teaching and Pedagogies of Transformation

**Don Dippo**

When teacher educators get together they find it very easy to talk to each other. I have been in meetings with teacher educators from Barbados and Brazil, England and Estonia, Germany and Georgia, Ireland and India, South Korea and South Africa, Zimbabwe and Zambia, and we talk about practicum placements. We talk about the length of our programs, about the appropriate balance between foundation and methods courses, and about the pressure to include more topics in an already overcrowded curriculum. And if we were ever able to convene a meeting of teacher educators from decades or centuries gone by, we would undoubtedly find talking with them just as easy. Across space and time, we would also likely find that in the evening, when the sessions and workshops are over, our conversation would turn to the unavoidable question of why, when asked, teachers seem to place so little value on their own teacher education experience.

In her Introduction to *Key Notes in Teacher Education*, Pitt (2009) laments the fact that the world of teacher education seems only to be able to be described as “an interminable problem of lack” (p. 1). She writes, “The persistence of identifying teacher education (and particularly the beginning of one’s teacher education) as a problem produces a never-ending parade of solutions, reform agendas and policy products” (p. 1). And yet, in spite of this never-ending parade, teacher education itself seems unreformable, its problems and practices persist in the face of changing times, changing priorities, and changing contexts.

Thirty years ago in *The Culture of School and the Problem of Change* (1982), Sarason asked similar questions about schooling. How is it that schools everywhere look so remarkably the same? How is it that the commonplace practices of schooling endure over time and space? How is it that schools come to be so resistant to significant change? His study focused on the culture of schools—the language, the

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D. Dippo, Ph.D. (✉)  
Faculty of Education, York University, Toronto, Canada  
e-mail: DDippo@edu.yorku.ca



traditions, the logics, the practices of inclusion and exclusion—in short, the “ways of life” in schools. His analysis led him to conclude that to change school culture, two kinds of knowledge are required—knowledge of historic and current contexts, and knowledge of how change comes about. The following section examines a particular historic feature of teacher education identified by Lortie (1975) as *the apprenticeship of observation*. I then describe efforts to infuse education for sustainable development into the preservice teacher education program at York University. The chapter concludes with a discussion of the question of change.

## An Apprenticeship of Observation

In expressing his own ambivalence about whether teacher education reform is possible, Russell (2009) identifies two persistent problems that obstruct serious moves in the direction of programmatic change. The first has to do with the unwillingness or inability of teacher educators to rethink and refresh their own classroom teaching practices (more on this at the end of this chapter). The second has to do with the fact that everyone, or nearly everyone in Canada, who aspires to teach and who enters a teacher education program has had years of experience going to school and watching teachers. Years of observation, however, do not necessarily provide insight into how teachers understand their work. Referring to what Lortie (1975) termed an *apprenticeship of observation*, Russell writes:

We have all heard this phrase, but do we fully understand how significant it is for our work as teacher educators? As Lortie explained, that apprenticeship is an unusual one, for it is not intended that people learn how to teach as they move through the school system. The apprenticeship of observation is incomplete as well as incidental, for students in school classrooms rarely have access to how their teachers are thinking about their work (p. 26).

Every person who attends school long enough can learn to act like a teacher. But acting like a teacher can actually get in the way of learning to become a teacher. Britzman (2009) identifies this as a problem associated with “growing up in education.” She writes:

Our opening problem is this: we have grown up in schools. We have spent our childhood and adolescence observing teachers and our peers, and when we enter the field of teacher education, this avalanche of experience we have undergone, made from schooling, confirms itself (Britzman, 2003, 2006). Growing up in education permeates our meanings of education and learning; it lends commotion to our anticipations for and judgments toward the self and our relations with others. It makes us suspicious of what we have not experienced and lends nostalgia to what has been missed (p. 41).

Rather than foster innovation and creativity in approaches to teaching and learning, an apprenticeship of observation tends toward reproduction and repetition of the familiar. One of the challenges of teacher education then is to disrupt what has been learned through an apprenticeship of observation, to reveal and to examine what such an apprenticeship has obscured—that is, the relation between the aims and purposes of education and approaches to teaching and learning in school. Being

explicit about the relationship between the “hows” and “whys” of teaching provides the missing contextual knowledge that Sarason identifies as necessary (although not sufficient) for changing teaching practice. It is partly this assumption that clarity about aims and purposes, and innovation in curriculum and program, can lead to transformation in teaching practice that has informed efforts to infuse education for sustainable development (ESD) into the teacher education program at York University (YU).

## **Teacher Education for Social Transformation: ESD at York University**

In order to begin to set the context for a discussion of sustainability in teacher education at York University, it is important to think back, not to some “golden age” when everything was better, but back to a time in the mid-1990s when there was hope—hope for a better future because progress, however measured, was being made in the present. Multicultural and antiracist programs and policies were being developed and implemented in school systems, in the public service, in labor unions, and even in some progressive corporations. English-as-a-second-language provisions and heritage language program in schools and community centers were thriving. Women’s organizations and so-called women’s issues were featured prominently in the daily news and at all levels of public discourse and debate. Gay and lesbian people were claiming rights and gaining public recognition. People with disabilities were demanding reasonable accommodation and nondiscrimination and getting it. There was progressive labor legislation. There was environmental protection. There was a social safety net. There was outrage in Toronto when a homeless person froze to death. It was a time in teacher education when, according to Grimmett (2009), the practice of preparing new teachers was defined as a problem of learning, and research in teacher education focused on “reflective practice, inquiry, and social justice” (p. 57). He sums up the approach to teacher preparation this way:

Hence, the language of “learning to teach” (Feiman-Nemser, 1983) replaced the language “teacher training”. Zumwalt’s (1982) “deliberative orientation” came to replace a “technical orientation”. Schon’s (1988) focus on “reflective practice” superceded direct instruction. Teacher learning was more than formal preparation; it included the beliefs, knowledge, and experiences that pre-service teachers brought with them into teacher education; it included their understanding of subject matter knowledge and how to connect it pedagogically; the way they made sense of their course work and field experiences in light of their own school experiences as students; and ways in which they developed professionally through observing other teachers’ practice, talking with them about it, and generally engaging in the joint work that made them colleagues (p. 58).

That was before neoconservatives took power and the “Common Sense Revolution” came to Ontario. Then came, from my perspective, bad times—tax cuts, budget cuts, program cuts, the repeal of progressive labor legislation, and environmental protection laws. By destroying, in one fell swoop, what many individuals and organizations had spent a lifetime building, the conservative government in

Ontario, effectively used a divide and conquer strategy to pit progressive forces against each other in a scramble for ever-diminishing resources. It was a period of disappointment and disarray. It was a period of vicious identity politics. Battles were fought over hierarchies of disadvantage and oppression. Feminists fought Marxists. Antiracists fought feminists. Multiculturalists fought antiracists. Gays and lesbians fought Afrocentrists. And environmentalists, who could find few who would listen let alone fight, accused all the rest of being anthropocentric.

Meanwhile, with the progressive opposition in self-destruct mode, conservatives went on their merry way cutting taxes, closing hospital beds, killing social programs, and selling off land, air, and water destruction privileges, largely unopposed. Teacher education too came under scrutiny and questions were raised “about whether or not teacher education made a difference to student learning in classrooms” (Grimmett, 2009, p. 59). Concerns about teacher quality and public accountability led, at one point, to a highly contentious teacher certification test that ultimately was abandoned. That said, there continues to be an increasing pressure on teachers and teacher educators to demonstrate standards and accountability. Conservative think tanks like the Fraser Institute have begun to call for de-regulation of teacher education. As Grimmett notes:

In Canada, the struggle is just beginning. While the research centres established during the second phase (teacher education as learning to teach) are still conducting strategic research, independently funded centres not attached to universities are sponsoring their own studies. The agendas are thus becoming complex, if not complicated, as the professionalization and de-regulation policy trends begin to intersect (p. 59).

There have been progressive alliance building efforts among teachers and teacher educators in Canada for some time. Some of these efforts predate the rise of neoconservatism. Others arose in direct response to the perceived neoconservative menace to society. Here I will briefly mention two progressive, education-related, coalition-building initiatives that sought to transform teaching and learning in schools and in teacher education—first, the curriculum development efforts of the Canadian Human Rights Foundation, and second, the Global Education movement.

The Canadian Human Rights Foundation initiative began in the mid-1980s and was an attempt to bring together feminist, antiracist, LGBT (lesbian, gay, bisexual, transgender) rights, environmental, disability, and antipoverty groups to develop curriculum materials aimed primarily at elementary school age children that directly addressed social justice themes and issues. The claim of the Human Rights Foundation was that all of these issues (inequities based on race, ethnicity, gender, class, sexuality, disability, language, religion, and social justice concerns like poverty, violence, militarism, and hopelessness) could be effectively dealt with under the Human Rights umbrella. They created some very good curriculum support materials (especially those focused on the UN Declaration of the Rights of the Child) and provided some excellent opportunities for teacher educators to become familiar with their materials but the initiative never really took off in a big way. This was, perhaps, bad timing. The materials were coming out at the same time as the ascendancy postmodern theory in the social sciences and humanities. Postmodernism, in its earliest iterations, was deeply suspicious of progress generally

and of progressivism in particular. Its powerful and compelling critique of “rights discourse” as hopelessly Western and Eurocentric gave many people reason to pause, and gave some sufficient reason to back away from the project of human rights entirely and to challenge inequity and injustice by other means on an issue by issue basis. The curriculum materials developed by the Canadian Human Rights Foundation are still available but, in my experience, not widely used.

The Global Education movement, most closely associated in Canada with the writings of Pike and Selby (1999), began from a more ecological/environmental position (in contrast to the above-mentioned human rights position) but did incorporate equity and development issues as well as then-new peace and justice education initiatives. In the early 1990s, Global Education had the attention and strong support of both the Canadian Teachers’ Federation (CTF) and the Ontario Teachers’ Federation (OTF). Global Education projects were very successful in securing research grants and in developing professional learning programs for teachers and teacher educators. Global Education became a recognized focus of graduate education at the Ontario Institute for Studies in Education (OISE). By the end of the 1990s, the flurry of activity that surrounded Global Education began to subside as teachers’ time, effort, and energy were exhausted in struggles over collective agreements and efforts to salvage programs in the wake of conservative “curricular reform.” The profile of Global Education in the Canadian educational community gradually diminished but never entirely disappeared. The Global Education Network continues to maintain an active Web site with many national and international links.

Sustainability education (SE), education for sustainability (EfS), and education for sustainable development (ESD) can be seen as yet another broad-based, alliance-building initiative albeit on a global scale. It offers a big, comprehensive view that incorporates social justice, economic justice, and environmental protection. It is attractive to some because of its complexity and comprehensiveness, though its origins in “discourses of development” make many people somewhat wary. The question for anyone interested in finding ways of working across social, political, and economic priorities toward progressive renewal in education is, “Does sustainability have a better chance of achieving effectiveness and longevity and of garnering broad-based support than did Human Rights Education or Global Education?” The answer is, “Maybe.”

In the 20 years since the Earth Summit in Rio (1992), as evidenced 10 years later in Johannesburg (2002), and leading up to meetings in Tokyo in 2014, sustainability has become a concept (vague and open to misunderstanding as it is), which has gained widespread acceptance and currency in the international community. Like state-sponsored multiculturalism in Canada, the term has its limitations but can be used to create, justify, and fund progressive projects, organizations, and research programs. With sustainability, there is no need to work to create “buy in” (i.e., acceptance) on the part of education providers, social service agencies, government departments, or funding sources as was the case for Human Rights Education and Global Education—support, indeed encouragement, is already there in UN documents, Federal Government documents, Social Sciences and Humanities Research Council documents, and Canadian International Development

Agency documents, to name but a few of the organizations that have identified sustainability as a priority.

But its blessing might also be its curse. The widespread appeal of sustainability as a term—its “of-course”-ness, its green popularity—very often leads to widespread misunderstanding of the ideas behind the concept and widespread misappropriation of the language of sustainability itself. For example, when Canada’s then Prime Minister Jean Chretien announced his support for the Kyoto Protocol at the World Summit in Johannesburg in September 2002, the Minister of Energy for the Province of Alberta went on television to denounce the Prime Minister saying that, “Kyoto will make the oil and gas industry in Alberta ‘unsustainable’.”

The vagueness of the term, however, is not without its advantages. It is, in some sense, what makes international coalition building possible. It is what enables people from many different places with many different priorities to come together to recognize and to affirm common interests and concerns and to develop long-term, global strategies for addressing social, economic, and environmental justice issues. For those working in education, for example, the place of sustainability within the curriculum will vary just as the areas of emphasis within sustainability will vary with national contexts and local circumstances. In some places the emphasis will be on basic education, while in other places the emphasis will be on education for girls and women. In some places efforts will be focused on the “greening” of the university, while in other places poverty reduction, urban crime, and violence will be of paramount importance. In some places the struggle will be to get environmental issues back on the public agenda, while in other places efforts to recognize, value, and protect the traditional knowledge and languages of First Nations peoples will be of utmost urgency.

This degree of topical comprehensiveness, however, can leave the impression of a concept without a center, which in turn can create problems when it comes to building long-term commitment. The person committed to working for economic justice, or gender equity, or environmental protection might feel that the importance, significance, and urgency, which ought to accompany his/her specific issue, is likely to be lost in a more comprehensive alliance of other activists with other competing, compelling interests. Even worse, in terms of coalition building efforts, people comfortable in more *ad hoc* alliances or committed to the creation of more heteroglossic and polymorphous political movements might interpret the move to sustainability as an effort to homogenize, to domesticate, and eventually to make more co-optable the more activist, unruly, and chaotic vanguard of a neo-progressive movement.

At York University environmental/sustainability initiatives have been ongoing, if somewhat diffuse, for at least the past 20 years. The Faculty of Education proclaims its commitment to addressing equity and social justice issues in all of its programs, and although many faculty members, staff, graduate, and undergraduate students may individually be committed to environmental protection and ecologically responsible living in their everyday lives, the faculty as a whole seems to be uncertain about the place of the environment and environmental issues within our teacher education and teacher development programs. For example, there has never

been a faculty-wide discussion about our collective position in relation to sustainability. Yet, the former President of York University signed the Talloires Declaration in 2002 committing the University to advancing environmental/sustainability principles and the current President has a Sustainability Advisory Committee that produces an annual report with recommendations for how the University can become a model of sustainability in practice (see Chap. 20).

That said, even a cursory review of sustainability activities in York University's Faculty of Education would give the impression that our Faculty is among the world's leading institutions in sustainability education, advancing the project on multiple fronts simultaneously. We have in the Faculty of Education at York a Graduate Diploma in Environmental and Sustainability Education; the Sustainability and Education Academy (SEdA) for school system leaders and the Sustainability and Education Academy-Subject Area Associations (SEdA-SA) for secondary school curriculum leaders (see Chap. 6 in this volume); in-service courses in Environmental Science, Environmental Studies, and Outdoor Education; an Indigenous Teacher Education Program; a compulsory, full-year course in the consecutive teacher education program focused on equity, social, and environmental justice; elective courses that address a range of sustainability issues including indigenous knowledge, urban education, globalization, and forced migration; practicum placements with community-based organizations including environmental NGOs; and multiple, multidisciplinary research initiatives focused on equity and social justice.

This number and variety of sustainability related initiatives begs the question(s): If collectively we are doing so much in terms of curriculum and program, why does environmental/sustainability education have such a low profile within the Faculty as a whole? And does this matter?

Part of the answer to the question about profile is that, at York, those of us who are initiating or participating in the activities listed above are doing these things largely independent of one another. We are not "a force" or "a movement" or even "an emerging field of interest and expertise." That is, we are not metaphorically walking together, arm-in-arm, under the banner of education for sustainable development; we are not looking to "ESD" as a source of intellectual vitality, leadership, funding, solidarity, or conceptual coherence. We seem content or satisfied to be able to do our work, to create courses, and to develop programs, without expecting or even aspiring to fundamentally change the way the Faculty thinks about or carries on its teacher education work. Does this fragmentation or "relative project autonomy" matter? Is it something to be concerned about?

Maybe and maybe not. As an academic administrator in the Faculty of Education for 10 of the last 15 years, I confess of being somewhat ambivalent about the situation; satisfied, even enthusiastic about the level of curricular and programmatic innovation, yet disappointed at the degree of impact these innovations have actually had on teacher education in the Faculty. Recall Sarason's (1982) insight that to change school culture requires not only knowledge of historic and current contexts of the kind that enables curricular or programmatic innovation but also knowledge of how change comes about and what is required for a culture to shift. It may well

be that an overemphasis on curriculum innovation and program development has resulted in insufficient attention being paid to actual classroom teaching practice. Here I return to Russell's (2009) observation that:

If invited to make one and only one change to the pre-service programme in which they work, many teacher educators seem likely to respond by requesting a change to the structure of the program—the length or spacing of practicum periods, addition or modification of a particular course or its place in the sequence of courses, or the length of the programme and the need to add courses on additional topics. Few of us seem inclined to seek a change in our own teacher education classrooms, and in my personal view this is one of the major reasons why teacher education changes so little and has minimal influence on how people teach (p. 25).

## Teaching as Sustainability Education

At the heart of the problem, for Russell, is the fact that teacher educators and our students have so “little experience of learning from experience” (p. 34) that we rely upon and reproduce those teacher-dominant pedagogies and unexamined assumptions about teaching and learning we hold, based on years of observing the work of teachers—our own apprenticeships of observation. What is required, then, is to change ourselves and to begin to develop approaches to pedagogy in our teacher education programs that are not just about sustainability but that challenge assumptions about teaching and learning and demonstrate what sustainability education could be. The good news for teacher educators is that, in other contexts, people have been thinking and writing for years about critical, participatory approaches to pedagogy. One such writer, artist/activist, and educator was dian marino, a professor in the Faculty of Environmental Studies at York University who died in 1993. Her book, *Wild Garden: Art, Education, and the Culture of Resistance* (1997), is “not about gardening” (back cover). Rather it is a collection of essays, interviews, and images that are about pedagogies of participation, about approaches to teaching and learning centered on questions and making mistakes, about challenging assumptions and common sense, and about creative, collective action for social change. As an adult educator, dian marino understood the importance of being self-conscious about her teaching. Echoing Russell's concerns she writes:

I believe quite firmly that we cannot *not* learn. In the sense that teaching always involves learning from the point of view of the professor or the faculty, even if it is unacknowledged learning, there is mutual learning going on even if this result is not discussed. I also don't think we can teach our students to be challenging and self-critical, socially critical, if we aren't struggling to get better at doing that ourselves. Teaching has a great deal of modelling that goes along with it and that is part of the responsibility of teaching (pp. 43–44).

Concerns about reproduction and resistance in education are recurrent themes in all of marino's writings. She is critical of the ways teachers, including herself, tend to gloss over or dismiss mistakes and avoid conflict in order to “achieve results.” Focusing instead on processes of coming to know and co-constructing knowledge,



marino urges educators to appreciate mistakes for the learning opportunities they present and to explore sources of conflict that are inherent in human interaction. Her aim in her classrooms was always to create the conditions for mutual learning to occur—for teachers and learners, leaders and participants, to engage each other in processes of knowledge critique and knowledge creation. Hers was a hopeful approach to critical pedagogy from which those of us who are seeking to transform our own teaching to be more in keeping with the aims and purposes of environmental and sustainability education can learn. Regarding the responsibility of the teacher and the question of impact, marino (1997) writes:

Hidden cracks in our social consent need to be made visible. Personal stories and social histories of resistance and change, the failures no less than the successes, need to be widely shared. Otherwise we are left with the impression that community issues and struggles are born out of nothing—or that only extraordinarily heroic people can get involved and make a difference (p. 28g).

While *Wild Garden* is “not about gardening,” *The Learning Garden: Ecology, Teaching, and Transformation* (Gaylie, 2009) is. In it, Gaylie, a teacher educator, documents the creation of a “learning garden” that provides both a material context and an extended metaphor for thinking and learning about teaching. She begins by situating garden-based learning (GBL) within the traditions of experiential learning and progressive education making the point that the physical labor and collaborative learning that work in the garden requires can be understood as consistent with, and in support of, principles of personal growth, social development, and ecological responsibility. What is more, she makes clear the connection between how she understands her work in teacher education as being related to larger societal efforts aimed at transformation. She writes:

When students at all levels experience the small gesture of building a campus garden, they are thus involved in a much larger awareness of how their food and energy choices connect and how their collective choices profoundly impact both local and world economies. It is, then, vital for students to be aware of both *what* they are learning and *how* they are learning in gardens. As Shiva says, “*Earth Democracy* connects the particular to the universal, the diverse to the common, and the local to the global” (p. 1 cited in Gaylie p. 25).

Both marino and Gaylie remind us of the powerful influence our own classroom practice can have on effecting change in the way we teach and learn in post-secondary education. To me, their writing is all about the knowledge of change processes that Sarason saw as so important to effect change in the culture of schooling. They can also be read in response to Russell’s charge that for teacher education to change, teacher educators need to think seriously about changing the ways we teach.

marino’s and Gaylie’s emphasis on classroom teaching enables us to imagine a more comprehensive approach to infusing education for sustainable development into teacher education, one that recognizes the importance of new policy direction, appreciates the contributions of curricular innovation and program development, and values the fundamental yet too often overlooked contribution of powerful pedagogy to social change. This, it seems to me, is the next step in moving ESD closer to the center of the way we think and talk about teaching and learning in teacher



education at York University. My plan is to buy a shovel and follow Gaylie into the “learning garden.” Here is why:

Leading students into garden-based teacher education is an entirely different space, where small ideas, learning processes and tangible knowledge matter. Eco-based teacher education, in its newness, can also lead students, initially, into some discomfort. To teach in the midst of confusion, discomfort and the unknown is not exactly a textbook model of what new teachers imagine ‘good’ teaching looks like. To teach student teachers in a garden is to therefore to re-imagine teaching from the roots, from deeper ideals around shared responsibility where comfort is not necessarily the primary objective. In the garden, ultimately, students locate within themselves a deeper sense of care for the earth, and for the garden community, that transcends their own individual objectives. An ability to move outside of themselves, to empathize, to work hard alongside peers, to give selflessly for (an unseen) future is at the core of their transformation into teachers (p. 202).

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**Part III**  
**School Systems**

# Chapter 6

## Sustainability and Education Academy (SEdA)

Gerry Connelly

### Introduction

How can school and education system leaders gain the knowledge and strategies needed to create sustainable organizations and promote a commitment to sustainable development with their students? As a former director of the Toronto District School Board, I have seen countless examples of education for sustainable development (ESD) in action. Yet, one of the most profound lessons about what ESD truly means—for students and communities—was driven home to me far from Toronto and Canada.

In 2009, I visited a village in the Masai Mara region of Kenya. Here, women and children walk miles to retrieve water from a dirty river, which they haul back to their village for drinking. The closest hospital is a 9-h drive away. The local school is a mud hut. In every respect, this is a world away from North American society.

Standing in that Kenyan village, one young man had a keen understanding of the overwhelming needs facing Africa. He had faced them himself, and long dreamed of ways to give African youth a better opportunity. But the young man was not a villager; he was a Toronto high school student who had arrived in Canada from Africa 2 years earlier. Now he was back in Africa, with 14 schoolmates, tutoring Kenyan children and helping to build a new school from the ground up.

The trip was part of his high school's Kenyan Leadership Experience Program, which combined classroom instruction in Toronto with 1 month in Kenya. The students had raised money for the Kenyan school, and once in Africa, they mixed the mortar and toiled on its construction with their own hands. They were literally laying the foundation for greater learning opportunities for generations of Kenyan children.

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G. Connelly (✉)  
Faculty of Education, York University, Toronto, ON, Canada  
e-mail: GConnelly@edu.yorku.ca

While living in Africa, this young man wished for the means to have such an impact. “Now that I’m in Canada,” he told me, “I’m so happy to be making use of all the opportunities that we have to make a difference.”

The Kenya trip was an initiative of Marc and Craig Kielberger’s Free the Children, a not-for-profit group that empowers youth to make a difference for other children around the world (e.g., international projects that provide clean water, health care, and sanitation.) The Kielberger brothers are also members of the ESD advisory board of SEdA—the Sustainability and Education Academy, based at York University in Toronto.

I am privileged to be the co-director of SEdA, which offers a comprehensive program for leaders in education from across Canada—a program that aims to inspire, create, and support a culture of sustainable development in all aspects of an education system. SEdA is the only leadership training program in Canada focused on helping senior education leaders to incorporate ESD into all aspects of their school systems.

SEdA, like the school project in Masai Mara, reminds us that education is not just about math, science, and English. It is also about encouraging students to learn about their place in the world, and how they can contribute in making their world a better place, whether at their doorstep or thousands of miles away.

To understand the focus and impact of SEdA, and appreciate the complexities of supporting education leadership for ESD in Canada, it is helpful to start with the Canadian context.

## **The Canadian Context**

Canada is one of the most resource-rich countries in the world, from mining to forestry to oil and gas. These industries have traditionally been the backbone of the Canadian economy. Yet, like many countries, Canada is moving toward a knowledge-based economy. The services sector accounts for an estimated 66% of the country’s gross domestic product (Statistics Canada, 2009). As with any knowledge economy, the most important resource is a well-educated population.

The changing needs of the labor force and the aging population (and, therefore, the increasing competition between education and health care for public funding) are just two of the forces that have important implications for the education sector.

Other factors at play include Canada’s multicultural make-up, one of the country’s defining characteristics. Canada is described as a “mosaic,” where different groups are encouraged to live together equitably while maintaining their ethnic and cultural diversity (Citizenship and Immigration Canada, 2009). This is a country with a high degree of immigration and, in some regions, a significant Aboriginal population. In fact, Canada is home to over one million Aboriginal people and this population is the country’s fastest-growing sector (Statistics Canada, 2008, 2011).

Against this backdrop and the new consideration for education leaders comes the concept of sustainable development. In 2005, the Government of Canada acknowledged education as a key strategy in managing sustainable development. The focus was defined as, “developing practical sustainable development strategies and raising public awareness ... to achieve the overall goal of improving individual and societal well being socially, culturally and economically” (Government of Canada, 2005, p. 4).

The *Education for Sustainable Development* page on the Canadian Commission for UNESCO Web site lists eight key action areas for project implementation:

1. Gender equality,
2. Health promotion,
3. Environment,
4. Rural development,
5. Cultural diversity,
6. Peace and human security,
7. Sustainable urbanization, and
8. Sustainable consumption (Canadian Commission for UNESCO, n.d.).

In Canada, education is a provincial/territorial responsibility. There is no federal department of education or national system of education. Instead, an association called the Council of Ministers for Education Canada (CMEC) provides a forum for provincial ministers of education to discuss matters of mutual interest. To address ESD at a pan-Canadian level, CMEC has produced several reports about the state of ESD in Canada (CMEC, 1999, 2006, 2007). In 2008, CMEC published a framework that provides specific statements relating to the future of ESD in Canada (CMEC, 2008).

While there have been many positive examples of ESD in Canada, ESD has not been a key driver of education reform, with the exception of the province of Manitoba (Manitoba Education and Training, 2004).

Canadian education policies and practices have centered on sustainability from an environmental perspective. However, the focus on the social aspect of ESD has increased, as evidenced by policies around equity, social justice, character development, citizenship, and civic engagement. The link among these social, environmental, and economic policies are emerging in provincial policies and in school systems’ programs and practices.

## The Foundation of SEdA

To date, SEdA is the only leadership training program in Canada focused on providing the knowledge and skills to help senior education leaders understand this relationship and to incorporate ESD into all aspects of their school systems.

The SEdA program began in 2005 through grants from Environment Canada and the Suncor Energy Foundation. It was originally adapted from a successful Sustainable Enterprise Academy (SEA) that the Schulich School of Business at

York University offered to leaders in the business field. The program design was a collaborative effort, with contributions from:

- Faculty at the Schulich School of Business;
- Faculties of Education and Environment at York;
- UNESCO Chair on Reorienting Teacher Education to Address Sustainability; and the
- Not-for-profit organization, Learning for a Sustainable Future (LSF).

The development process included ongoing collaboration with education leaders in school systems, as well as business leaders who are champions in ESD. SEdA also has a national and international group of advisors who are leaders in ESD to provide advice and ideas on successful global practices.

SEdA's flagship offering is a series of Education Leader Seminars (see Sect. 6.4). Each seminar is a 2½-day event, aimed at informing and motivating education leaders—giving them the knowledge and strategies needed to transform school systems into sustainable organizations.

SEdA embraces the concept that leadership is distributed across all aspects of a school system, and needs to be supported and encouraged accordingly. For each seminar, SEdA encourages school divisions to bring a team of school and system leaders, including the Director or Superintendent and trustees. As a team, all workshop participants can later champion and build the capacity for supporting ESD in their systems.

While SEdA is still in its relatively early stages, growing and learning along with its participants, the creation and operation of SEdA responds to three fundamental challenges for Canadian educators:

- It is critical to understand the social, economic, and environmental components of ESD and their interrelationships in the Canadian context.
- Numerous and competing demands are being made on the education system. If ESD is seen as another priority that detracts from the existing priorities—such as literacy, numeracy, equity, and responsible citizenship—it will not be readily embraced. Instead, it is important to recognize how ESD can be incorporated into the existing priorities in education.
- SEdA recognizes that leadership for sustainable development currently is not incorporated into leadership training for educators in any significant way. SEdA does not compete with the multitude of leadership training programs, but provides a unique niche that adds value to the understanding and skills that education leaders require to succeed.

### ***Social, Economic, and Environmental Components of ESD***

The United Nations Decade of Education for Sustainable Development (UNDESD) states the need “to create ... a world where everyone has the opportunity to benefit from education and learn values, behavior and lifestyles required for a sustainable future and positive societal transformation” (UNESCO, 2005, p. 6).

This statement is subject to many interpretations; one estimate suggests that there are over 200 different definitions of sustainable development (Office of the Auditor General of Canada, 2010).

A survey conducted by the Mustel Group in 2009 reveals that few Canadians were able to define the term “sustainability.” However, over half (56%) of those surveyed were familiar with the definition of “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Hoggan, n.d.).

This broad nature of ESD makes it an elusive topic. For example, several Canadian provinces have policies that reflect an environmental emphasis on sustainability. Yet, UNESCO (2005) distinguishes ESD from Environmental Education (EE), and considers EE to be just one part of a comprehensive program of ESD responses. This lack of clarity creates a challenge for leaders to provide a coherent context for the range of initiatives that fall under ESD, including areas such as social justice, equity, responsible citizenship, and environment and financial literacy.

### *Incorporating ESD into Existing Education Priorities*

The most common focus of ESD in the education system is on the environment and facilities. School systems have demonstrated cost savings in their energy and waste reduction policies and practices, and this focus is also incorporated into classroom programs. Students are encouraged to develop an environmental ethic, for instance, that includes energy and waste reduction.

Consider the efforts of Dearness Environmental Society, a SEdA partner. This not-for-profit organization provided support to teachers, students, administration, and facility personnel around integrating ESD into policies and practices, particularly related to energy and waste reduction (DES, n.d.). Eventually, students and teachers became more interested in creating hands-on links to global and local problems. Dearness’s work has evolved into a comprehensive service. They now work with individual school districts to provide support across the system. Dearness shares SEdA’s position that ESD should not be seen as an “add-on,” but should be incorporated into all aspects of the education system.

Improving literacy and numeracy outcomes is a key priority in all school systems. Its success in Canada is reflected in the country’s high standing in the Program for International Student Assessment (PISA) results and continuously improving graduation rates (OECD, 2010). Educators are hesitant to detract from this priority. Yet, to close the achievement gap between the high- and low-achieving students—and to improve student engagement at all levels—schools need to provide a purpose for education that resonates with students.

ESD provides a context and a purpose for teaching literacy and numeracy—and with measurable results. For instance, involving students in case studies that explore the social, environmental, and economic implications of climate change supports the goal of responsible citizenship, and meets curriculum expectations in many subject areas. A problem-solving approach to issues that are relevant to students

also engages them in learning, and inspires them to take action in their local and global communities.

In this area, one of the SEdA partners, LSF, provides significant leadership in teaching and learning across Canada (LSF, n.d.). The not-for-profit LSF was founded in 1991 by the National Round Table on the Environment and the Economy (NRTEE) to implement sustainable development education in Canadian schools. Since then, the LSF has introduced many pan-Canadian sustainable development initiatives in education (LSF, n.d., 2009), which align with UNESCO's philosophy and vision. These include:

- Establishing ten provincial/territorial ESD working groups in collaboration with Environment Canada and Manitoba's education department. These groups are active in sponsoring public forums, providing input into provincial curriculum reviews, developing resources, planning conferences, and creating Web sites.
- The Canadian Sustainability Curriculum Review Initiative which encourages and supports curriculum reform across Canada in order to align school curricula with the goals of ESD.
- Youth leadership forums that focus on local ESD issues. These forums encourage youth to develop and implement their own action projects within their school or community.
- An online ESD Resource Database, "Resources for Rethinking," which includes lesson plans and other curriculum resources for teachers from K-12.
- Professional development for educators to encourage ESD in classrooms.

### *ESD as Part of Leadership Development*

SEdA is based on the belief that if we are truly committed to sustainable development, then it must be an integral part of leadership development. A key question is: How do we engage staff, students, and the community as full partners in embracing the opportunities and overcoming the barriers to incorporate ESD into all aspects of the school system? Understanding the value of that effort is a critical component of the leadership development program.

For SEdA, the focus is on engagement rather than persuasion. Persuasion too often emphasizes one-sided arguments or indoctrination. In contrast, engagement is based on a two-way dialog and mutual learning. For example, rather than trying to sell a predetermined view of sustainability, educators can use a dialogue-based approach to engage others in defining what sustainability means to them—and what steps they are prepared to support to achieve it. SEdA uses a group activity, "Imagine a sustainable community," as a starting point in its seminars. Finding a common ground builds a sense of community and confidence in people's ability to work together. It also creates the shared norms that are the strongest motivators for action, and for changing behavior.

Empowering our students and others to devise and take actions that promote more sustainable development is an essential element of SEdA's change management



strategy. This strategy positions the school system as an important partner and a model for the public and the community in creating a more sustainable future.

## **The SEdA Seminar**

At each SEdA seminar, school systems are invited to bring a team that includes representatives from all central departments, school administrators, and board trustees. These teams work with an experienced coach who provides direction and supports the concept of distributed leadership. The following account describes what happens during a seminar and the overall goals.

### ***Incorporating ESD Broadly***

One of the key resources developed by SEdA is a “Domain Framework” for incorporating ESD and evaluating ESD in all aspects of the school system (Table 6.1). These five domains reflect the way school systems are traditionally organized. The domains are:

1. Governance (Board Services),
2. Curriculum/teaching learning (School Services),
3. Human capacity building (Human Resources/Employee Services),
4. Partnerships (Community Outreach Services), and
5. Facilities (Operations Services).

The Domain Framework identifies questions in each of the domains. These questions guide the focus on ESD in each of the central departments and schools. The framework also provides a tool to measure and evaluate the status of implementation. The results of the evaluation can be used to review progress, to identify areas requiring additional support, and to celebrate and share successful practices.

SEdA participants are encouraged to examine their system priorities and look beyond what they are already doing in ESD, to embrace creative and innovative ideas. They, then, identify ways to move from their current reality to their vision using strategic tools and supports provided by SEdA, and by sharing successful practices.

The coaches respect the context of the team’s community and the provincial or regional goals and priorities. In particular, the Aboriginal perspective is represented (e.g., respect for the earth), with that experience and historical commitment helping our understanding of sustainability and providing a rich context for ESD.

A guiding principle of SEdA is that the richest learning occurs from sharing our stories and experiences. So SEdA is compiling and continuously adding case studies from ten jurisdictions: Saskatoon Public Schools (Saskatchewan, 2011), Manitoba (a provincial approach) (2011), Rainbow District School Board (Ontario) (2007c), York Region District School Board (Ontario) (2007b), Toronto District

**Table 6.1** Domain framework for a whole-system approach to ESD

Domains	Elements	Degree of implementation				
		Not considered	Beginning progress	Some progress	Satisfactory progress	Full implementation
<i>Governance</i>	<p><i>1.1 Policy</i> A systemic approach to implementing SD priorities is reflected in the system's strategic planning, asset management, policies, and school improvement plans</p> <p><i>1.2 Decision-making</i> The system and schools embrace a transparent, inclusive, participatory approach to decision-making, involving all partners</p> <p><i>1.3 Finance and budgeting</i> Progressive approaches to financial modeling and budgets reflect both short and long term sustainability of the education system</p> <p><i>1.4 Monitoring and evaluation</i> Assessment mechanisms measure progress in systemic implementation of ESD principles</p>					
<i>Curriculum/teaching/learning</i>	<p><i>2.1 Curriculum</i> (a) Policy and resource documents reflect the cross-curricular focus of ESD across all subjects and grades, and through integrated courses of study</p> <p>(b) There is continuity of scope and sequence of ESD implemented across all subjects and grades</p> <p>(c) ESD resources are provided for teachers including a variety of media, sample units of study, course profiles, teaching guides, electronic and text based resources</p> <p><i>2.2 Teaching</i> (a) Pedagogical approaches include critical thinking, active citizenship, systems thinking, inquiry, active learning, problem-solving, futures thinking, emphasizing both a local and global approach</p>					

(b) Natural and human-built environments are utilized as sites of discovery and active learning

2.3 Learning

(a) Schools provide a safe and supportive learning environment in which students are engaged in decision about their school and their learning

(b) Transparent assessment mechanisms monitor student achievement in ESD, including an action learning approaches

3.1 Leadership

Human capacity building

System and school administrators demonstrate commitment and leadership in the implementation of ESD across the system

3.2 Professional development

(a) Professional development provides teachers with ESD competencies, including knowledge, skills, perspectives, pedagogical approaches, and using ESD as a theme to contextualize learning

(b) Professional development provides non-teaching staff with the knowledge and skills to further ESD goals of the school and system

(c) Staff share good practice, learning models and resources that support ESD

3.3 Human resources

(a) ESD competencies are addressed in performance appraisals and hiring policies

(b) HR policies for all system staff support SD capacity building, mentoring, collaborative and lifelong learning

(c) Diversity is celebrated and is reflected in the staff who all work to build respect among all members of the school and community

(d) Staff are recognized and rewarded for ESD leadership

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(continued)

**Table 6.1** (continued)

Domains	Elements	Degree of implementation				
		Not considered	Beginning	Some progress	Satisfactory progress	Full implementation
Facilities and operations	<i>4.1 Facilities</i>					
	(a) Sustainability principles are applied to the design, construction and renewal of school buildings, including innovative financial models					
	(b) Schools structures and outdoor spaces are “facilities that teach” sustainability practices					
	<i>4.2 Operations</i>					
Partnerships	(a) Sustainability principles apply to all aspects of school management, procurement and resource use					
	(b) Sustainability principles apply to transportation decisions					
	(c) Audit tools are used to assess impacts and improve efficiencies					
	<i>5.1 Parent and Community Partnerships</i>					
	Parents and the community are actively engaged to address local sustainability issues through community projects and/or partnerships					
	<i>5.2 Learning</i>					
	(a) Cooperative education supports ESD partnerships with the community					
	(b) Opportunities exist to engage parents and the community in the practice of ESD principles					

School Board (Ontario) (2007e), Richmond District School Board (British Columbia) (2008a), Quebec (English and French) (2008b), Australia; Ireland (2007a), and the United Kingdom (2007d). The case studies are available on the SEdA Web site (<http://www.yorku.ca/seda/casestudies.html>).

The case studies focus on the challenges, opportunities, and accomplishments within each of the domains. This helps participants to understand the evolution of a concept, and the ways in which ESD is understood and implemented among the various jurisdictions. This rich resource is the only Canadian story of how school systems are implementing ESD.

SEdA seminars bring in a wide range of experts, including university representatives, not-for-profit organizations, members of the business community, and government officials. Between them, they play different but key roles in the education system, as partners, teacher trainers, creators, and disseminators of knowledge, policy-makers, and advocates.

The core business for school systems is teaching and learning. For this reason, building capacity for supporting teaching and learning for ESD is a major focus of the seminar. Speakers share successful practices in school systems, as well as in universities in Canada and internationally, regarding professional development and programs that support ESD.

At the end of the seminar, participants share their message and strategy with another team as part of the peer mentoring/coaching strategy. In this way, all participants receive useful advice as well as confidence. Most importantly, they have an understanding and a commitment to commence or continue the ESD journey.

## ***Building Sustainable Communities***

An integral part of the seminar is understanding ESD in terms of sustainable communities and school systems. A community could be as small as a few neighborhoods, or as large as a city, province, country, or even a global community. Based on our experiences, sustainable communities are defined as healthy, thriving, livable places where:

- People care for themselves and each other, as active participants toward a common good.
- Education and healthy lifestyles (well being) are high priorities.
- Diversity is valued and respected.
- Employers are attracted to the community because of a well-educated workforce.
- Social services are available and accessible.
- Members of the community work together to create an environment that values sustainable development, and encourages innovation and risk-taking, based on these values.

Participants are asked to envision their community as a sustainable one and consider how education and their leadership would contribute to this community. They are also asked to reflect on the implications for their communities and their lifestyles if *all* the communities on earth had these attributes.

## ***Goals of the Seminar***

As a result of a SEdA seminar, participants are expected to:

- Understand their system's commitment to ESD (province and division level).
- Develop a change management strategy to incorporate ESD into all aspects of their system.
- Articulate their role as leaders in implementing ESD.
- Communicate their understanding of ESD to fellow staff, students, and the community.
- Know who to contact within SEdA and other resources for advice, support, and ideas around ESD.

The SEdA seminar is one stage in the process of implementing ESD. It is an important component, but becomes much more valuable with ongoing support for ESD within the system. To this end, SEdA faculty are engaged with ESD leaders in Ireland, the UK and Manitoba to implement an evaluation workshop based on successful practices, which will support work at the central administration and school levels. In addition, SEdA is committed to providing ongoing support for implementing ESD at the system and school level.

## **Conclusion**

Transforming school systems into sustainable organizations requires time, commitment, and support. This is a journey. All sectors of the community contribute to ESD. For example, the knowledge leadership provided by universities and the advocacy leadership and resources provided by not-for-profit organizations contribute to education priorities (e.g., responsible citizenship and improved graduation rates) and, therefore, to student success. The goals of responsible citizenship and character development are key education goals in all jurisdictions—and are an essential component of ESD.

Think of the Toronto students mentioned at the outset who visited that village in the Masai Mara region of Kenya. The experience was an education for me in the power of ESD, but offered even more powerful lessons for the students, about:

- Sustainable development from the perspective of a developing nation.
- Sharing, equity, and helping the less fortunate.
- Conflict resolution, and how to get along with and support each other.
- Our interconnectedness, and respecting people from other backgrounds (something that is essential in a diverse society).
- Personal and collective responsibility and character.

If we can nurture students who have that sense, who look outwardly as well as inwardly, then I have no doubts that our communities—locally and globally—will be sustainable.

Based on SEdA's experience, education leaders who have successfully embraced the concept of ESD have a number of qualities in common.

- They are courageous, passionate innovators who have the vision and personal attributes to engage others.
- They understand how to build, implement, and monitor an action plan and incorporate ESD into all aspects of their school system.
- They understand and model sustainable development in both their personal and professional lives.
- They have the skills to communicate their vision of ESD.
- They reach out to nurture partnerships with community organizations, NGOs, and post-secondary institutions that support the goals of ESD.

The education leaders that we work with through SEdA, the increasing emphasis on ESD at the provincial and federal level, and the work of the various school districts, schools, and classrooms are all indications of a growing understanding and commitment to ESD. That is all the reason for optimism.

Preparing youths to become citizens who can contribute to the betterment of our communities requires not just the traditional 3Rs of schooling, and not just the environmental 3Rs of reduce, reuse, and recycle. Students also need to take to heart the 3Rs of respect, rights, and responsibility. What better model for Canadian students than an education system that demonstrates this in all aspects of their work.

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# Chapter 7

## Education for Sustainable Development in Manitoba: A Provincial-Wide Approach

Carolee Buckler and Anne MacDiarmid

### Sustainable Development and the Province of Manitoba

Manitoba is fortunate to have a clean, natural environment, and vast water resources, although some of these natural resources are under threat from a number of environmental pressures. The province of Manitoba wants to ensure a sustainable environment and prosperous economic future for our children and grandchildren and has been working to achieve a greener future for all Manitobans.

In 1997, the province of Manitoba passed the Sustainable Development Act (SDA) to create a framework through which sustainable development was to be implemented in the provincial public sector and promoted in private industry and in society generally. In the SDA, the Brundtland Report's definition of sustainable development was adopted—"meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Manitoba Government, 2011).

Government departments, crown corporations, health authorities, local governments, school divisions,<sup>1</sup> universities, and colleges are now required to adopt a sustainability approach and carry out activities consistent with the principles and guidelines found in the SDA. Manitoba was the first province in Canada to pass such an act.

The Act established the Manitoba Round Table for Sustainable Development, an advisory body to the government, as well as the Sustainable Development Innovations Fund (SDIF) that provided about C\$3.6 million annually to support

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<sup>1</sup>A school division/district in Manitoba is an administrative entity, bounded geographically, over which a school board has jurisdiction. Currently there are 37 school divisions and districts in Manitoba.

C. Buckler (✉)

Sustainable Development Coordinator, Manitoba Education, Winnipeg, MB, Canada  
e-mail: Carolee.Buckler@gov.mb.ca

A. MacDiarmid

ESD consultant, Manitoba Education, Winnipeg, MB, Canada  
e-mail: anne.macdiarmid@gov.mb.ca

sustainability projects. Some of the projects funded through the SDIF supported K-12 sustainability learning and action projects such as school yard greening, greening institutional operations, and creation of curriculum resources. The SDIF fund, however, has not been able to offer grants since 2009 due to fiscal restraints in government. Nevertheless, both the Round Table and the SDIF have served to demonstrate and communicate the government's solid commitment to sustainability—a commitment that has survived a change in government. Cabinet Ministers sit at the round table and this political commitment has been the key to promoting education for sustainable development (ESD). Furthermore, involvement by education leaders at the national and international levels has also helped to raise the profile of ESD and establish a reaffirming and supportive environment for moving forward provincially. The priority accorded to ESD in Manitoba stemmed from a fortuitous combination of factors, including the publication of *Our Common Future* (World Commission on Environment and Development, 1987) and the presence of politicians and civil servants within the senior levels of government who understood the call for sustainable development and decided to respond to it.

Many key issues and agendas are connected to sustainable development in Manitoba. Since the establishment of the Act, the Manitoba government has implemented initiatives, laws, and programs aimed at protecting and improving the province's environment. Some of these include Climate Change Action Plan, Beyond Kyoto 2002–2008 (Manitoba Government, 2002); Manitoba's Water Strategy; Manitoba's Green and Growing Strategy; Manitoba's Climate Change and Emissions Reduction Act; and Next Steps Beyond Kyoto 2008. All have helped to push sustainability to the forefront in Manitoba. In addition to the aforementioned, ministerial communication messages have been clear regarding the importance of learning to live and work in a sustainable way.

Manitoba's sustainability efforts have been recognized by several independent bodies like the David Suzuki Foundation, the Canadian Energy Alliance, and by the influential *Business Week* magazine that placed former Premier Gary Doer in the list of the top 20 international leaders who are combating climate change. Former Premier Doer was the only Canadian leader on this list. The magazine also ranked Manitoba as the number one regional government in the world for battling climate change (Manitoba Government, 2005).

## **A Culture of ESD in Manitoba Schools**

Linking education and sustainable development is a high priority in Manitoba. Education is a primary agent of transformation toward sustainability, increasing people's capacities to transform their visions for society into reality. Educated citizens who have learned to make decisions that consider the principles, values, and practices of sustainable development will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations in Manitoba. In pursuing these goals, a priority area for

education in Manitoba is the presence of high-quality, responsive educational opportunities for all students.

In Canada, education is the exclusive responsibility of the provinces/territories. There is no federal department of education. Departments or ministries of education are responsible for the organization, delivery, and assessment of education at the elementary and secondary levels (K-12) (Council of Ministers of Education Canada [CMEC], n.d.). The ministers responsible for education in the provinces/territories come together in the Council of Ministers of Education, Canada (CMEC) to discuss matters of mutual interest, undertake educational initiatives cooperatively, and represent the interests of provinces and territories nationally and internationally (CMEC, 2011).

In Manitoba, the Department of Education oversees educational policy for K-12 in schools. The primary responsibilities of Manitoba Education are to facilitate the improvement of learning at the K-12 levels. Emphasis is placed on enhancing learner performance, delineating roles and responsibilities across the education system, and facilitating the development and sharing of new knowledge. The overall responsibilities of the Department of Education include:

- Providing leadership and setting strategic direction for education,
- Articulating appropriate legislative and regulatory structures,
- Allocating funds to the Province's public and independent school systems, and
- Representing the Province in negotiations with the federal and other governments.

Manitoba Education also shapes the content of schooling in the province through the development of the provincial curriculum. At the provincial level, consultants are responsible for coordinating and facilitating curriculum development, including the production of guides providing teaching strategies, background information, learning resources, and student materials.

As a result of Manitoba's strong commitment to sustainable development, in 2000, Manitoba Education created the provincial position of Sustainable Development Coordinator, the first of its kind within an Education Department/Ministry in the country. The position of Sustainable Development Coordinator was created to provide support and leadership toward enhancing a culture of ESD in school divisions and postsecondary institutions across the province. The issue of sustainability was deemed too important to be included as an addition to an already diverse government employee's portfolio of responsibilities; it required intense focus on its own.

The first task for the Sustainable Development Coordinator was to create a guide to assist Manitoba curriculum developers and educators to integrate sustainability concepts into new and existing curricula. What resulted was the document, *Education for a Sustainable Future: A Resource for Curriculum Developers, Teachers, and Administrators* (Manitoba Government, 2000). The document was interdisciplinary in approach, and provided direction for the integration of sustainability knowledge, skills, values, and life practices within the curriculum, the classroom, and the community.

Following this, in 2004, the provincial Ministry of Education declared ESD to be one of the Ministry's top priorities and developed a provincial Education for Sustainability Action Plan (2004–2008) that directed the first steps in fostering teaching and learning for sustainability in elementary and secondary classrooms (Manitoba Government, 2004). The aim of the action plan was to support educators in their efforts to teach about and for sustainability. The action plan committed the Department of Education to a comprehensive suite of actions to be carried out across Manitoba including:

- Integrate sustainable development concepts into new curricula.
- Conduct teacher training workshops and other projects that enhance teaching and learning for sustainability, such as the UNESCO Associated School Project Network.
- Develop a Web site focused on ESD.
- Establish grants for educators to collaboratively plan, develop, and implement sustainability focused curriculum units.
- Focus information, best practices, and learning resources on education for sustainable development.
- Establish a provincial ESD working group to create a culture for education for sustainability.
- Provide for benchmarking and tracking of sustainability outcomes in the curriculum.

In 2009, Manitoba Education took a significant step when it embedded sustainability in its mission statement by stating:

To ensure that all Manitoba's children and youth have access to an array of educational opportunities such that every learner experiences success through relevant, engaging and high quality education that prepares them *for lifelong learning and citizenship in a democratic, socially just and sustainable society* [emphasis added].

Sustainability is also included in the overarching goals found in the mandate: “*To ensure education in Manitoba supports students experiencing and learning about what it means to live in a sustainable manner* [emphasis added].”

Manitoba is currently the only Department/Ministry of Education in Canada that has sustainable development as part of its mission and vision statement. In Manitoba, these are the top five priority action areas:

1. Education for Sustainable Development,
2. Education in Low-income Communities,
3. Aboriginal Education,
4. Education in Rural Manitoba, and
5. Education in Northern Communities.

By embedding sustainability into the mission statement, the Ministry of Education helped early adopters (i.e., existing sustainable development champions within the schools) develop a sense of validation of the importance of their sustainability efforts. It also communicated to the education community that education for sustainable development is important, compelling others to get involved.

It should be noted that many schools in Manitoba had been involved in identifying and addressing local sustainability matters prior to ESD becoming a priority in Manitoba. A number of individual schools and school divisions across Manitoba were actively involved in a wide range of sustainability projects and programs. In many cases, individual schools participated in one or more certification or awards programs and/or have received grants to undertake sustainability activities. Since ESD became a priority, several school divisions have created sustainable development policies and mission statements. Due to the increasing importance of ESD in Manitoba, Manitoba Education added a Sustainable Development Consultant to its staff in 2007 to provide ESD professional development, training, and curricular support in the infusing of ESD into K-12 schools and school divisions in the province.

With the launch of the United Nations Decade of Education for Sustainable Development (UNDESD) in 2005, the province of Manitoba has taken a leadership position in support of the UNDESD and has been active in all aspects of education for sustainable development (ESD).

## **Partnerships for Education for Sustainable Development**

Manitoba Education recognized early on that in order to prepare students to live more sustainably, additional educational supports would be required, such as funding, in-service and pre-service professional development, and ESD resources. All of these require a coordinated partnership approach to ESD. Manitoba also took the approach that ESD should not be imposed from above, but rather, it should be built upon local understanding and on the practices that currently exist in ESD in our schools and school divisions and communities. Manitoba Education partnered with nongovernmental organizations (NGOs), the private sector, schools and school divisions, and government departments to strengthen and expand its reach and effectiveness. Some of its key partners include: Ducks Unlimited, Manitoba Forestry Association, Manitoba Hydro, International Institute for Sustainable Development, Learning for a Sustainable Future, FortWhyte Alive, the Earth Charter, and Arts Junction. Manitoba Education co-chairs the Manitoba Education for Sustainable Development Working Group (MESDWG) and supports ESD work of the Manitoba Teacher's Society, Manitoba Association of School Superintendents, the Manitoba Association of School Business officials, and the Manitoba School Board Association. All of these organizations are doing important work to move ESD forward in Manitoba.

MESDWG was established in 2005 to provide a focal point for interested parties (government departments, NGOs, school divisions, postsecondary institutions, and community members) to become involved and work together to create a culture of ESD in Manitoba. Through sharing of experiences and planning collaborative activities, the MESDWG plays a key role in ESD. The MESDWG also helped to reaffirm that ESD is not restricted to the formal education sector but can—and must—play a

substantial role in the non-formal and informal sectors as well. This was the first such working group to be established in Canada. Six other such provincial and territorial working groups have since been established.

The same year (2005), the Council of Ministers of Education Canada (CMEC) chose Manitoba to represent the provinces and territories in matters related to ESD (nationally and internationally). Manitoba Education Deputy Minister, Gerald Farthing, represents ESD internationally for Canada through the Council of Ministers of Education Canada (CMEC) and, after serving on the ESD Steering Committee of the United Nations Economic Commission for Europe, has now accepted the position of chair for the remainder of the decade.

The CMEC Education for Sustainable Development Working Group (CMEC-ESDWG) was established in 2008 and is made up of representatives from ministries of education across Canada. Its purpose is to act on the commitments made in the Statement on Education for Sustainable Development and the Learn Canada 2020 declaration and to develop a pan-Canadian ESD Framework for Collaboration and Action that builds on current activities for enhanced collaboration at the jurisdictional level (CMEC, 2010).

This national/international role informs efforts closer to home, where the Manitoba Department of Education and the CMEC ESD working group focuses on partnerships to support school divisions, schools, and individual teachers as they strive to educate about and for sustainability.

## Governance

Manitoba's action plan, noted previously, was based on a provincially developed policy (The Sustainable Development Act) that helped to create a ripple effect of policy creation and action at the local school division level (Manitoba Government, 2004). Since 2008 or in some cases before, ESD has become a divisional priority in a majority of school divisions in the province, especially those participating in the Sustainability and Education Academy (SEdA). This seminar targeted senior education personnel in school divisions with the goal of "creating a culture of sustainable development integrated into all aspects of the K-12 educational system." The SEdA seminars have been instrumental in assisting with systemic ESD change in Manitoba (Buckler & MacDiarmid, 2011a). School leaders and administrators play a central role in creating a culture of ESD in Manitoba. Their leadership has helped to create the commitment and participation required from all parts of the school community to embed sustainability effectively into school level policies, programs, and practices (see Chap. 6).

In order to further the action plan at the division level, funding was provided by Manitoba Education as well as private sector partners to both individual schools and school divisions. The Ministry, in partnership with Manitoba Hydro, introduced a funding program in 2006 that provided 15 grants of up to C\$2,000 for schools to cover teacher release time, professional development, and educational

resources to support ESD action projects. These grants are still available and, in 2011, 58 proposals were submitted from 26 school divisions in the province. The recipients have been highlighted on the provincial ESD Web site.<sup>2</sup>

At that same time (2006), an ESD categorical grant was provided through the Ministry to school divisions based on a formula of C\$700 per school annually. This allowed the ESD funding to be more systemic for schools in the province. The intent of this ESD categorical grant was to support schools/school divisions in their efforts to incorporate ESD into all aspects of school division and school activities, operations, and programming. Schools use these grants for a variety of initiatives such as recycling and composting programs, outdoor learning classrooms and school gardens, social action projects, and resource acquisition; to name just a few. The ESD action projects initiated by teachers and students are an integral part of School Division's Sustainable Development Plan.

In 2008, The Eco-Globe Schools recognition program was established to celebrate the ESD journey of K-12 schools in Manitoba. It recognizes three levels of commitment and participation of the whole school: Awareness, Action, and Transformation.

It should also be noted that some Manitoba schools have adopted international and national (ESD) frameworks and principles, such as UNESCO-profile schools. Other schools have been recognized for their environmental actions through the green schools program organized by the Society, Environment, Education, Development (SEED) Foundation. Two schools in Manitoba have reached Earth IV status with SEED Canada's Green Schools Project. Reaching Earth IV means the students have made 4,000 positive actions to help the environment. The actions range from turning off the tap when they brush their teeth, to taking hazardous waste to be recycled instead of adding it to the landfill.

Manitoba Education has also created a number of sustainable development resources, including *A Guide for Sustainable Schools in Manitoba* (Swayze, Buckler, & MacDiarmid, 2010). This guide supports schools in their development and implementation of more sustainable practices and processes.

## Curriculum/Teaching and Learning

Manitoba Education took an integrated approach to the implementation of sustainable development into the curriculum rather than developing a stand-alone course. ESD is embedded in the K-12 curriculum with specific outcomes established in science, social studies, health and physical education. Any new curriculum that is being developed is being analyzed, for example technical vocational education, to determine where sustainable development concepts can be incorporated.

In 2008, Manitoba Education embraced the principles of sustainable development expressed in the Earth Charter (2000). Since then, schools have been finding

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<sup>2</sup>[http://www.edu.gov.mb.ca/k12/esd/grant/recipients\\_11.html](http://www.edu.gov.mb.ca/k12/esd/grant/recipients_11.html)



a wide variety of ways to apply the Charter. For example, students all across Manitoba participate in youth forums and action projects; social studies and science curricula are being designed with outcomes connected to the principles of the Charter; and educators in Manitoba are developing initiatives in their own schools that foster the culture of sustainability.

In addition to integrating ESD into the curriculum and embracing the principles of the Earth Charter, Manitoba Education is updating its Grade 12 World Issues course to become *Global Issues: Citizenship and Sustainability*, including a strong emphasis on sustainability and what it means to be an ecologically literate citizen. This course consolidates student learning across the disciplines and across the years to help students develop competencies that will allow them to live together as active citizens, who appreciate their place in nature and in society and are willing to work together toward a sustainable future. It is designed to help students develop a critical awareness about global issues, to alert them to the urgent need for vigilance regarding the consequences of our individual and collective decisions, and to provide them with opportunities to take socially responsible action.

Manitoba Education is in the process of creating a document which would identify K-12 student ESD competencies. These ESD student competencies are being developed to assist educators to understand what knowledge, skills, values, attitudes, and behaviors/actions are needed to ensure a sustainable future. Student competencies shape the direction of learning by using the ESD outcomes in the curriculum to incorporate sustainability into learning.

In our efforts to prepare young people to enter the labor market, we are also exploring what job opportunities are available to help our young people make a living in a more sustainable way. What are the skills needed to meet the growing demand in the area of green jobs? Manitoba Education is working on the creation of a *Green Jobs and Sustainable Development Careers Guidebook*. This resource will provide essential tools for students, guidance counselors, and other educators interested in learning more about green jobs and sustainable development careers.

In March 2011, the Government announced new funding to support the Technical Vocation Initiative (TVI) in order to help give students the tools and skills they need to meet the growing demand in the green jobs sector for workers who possess technical vocational skills. The 4-year program initiative will build on the success already achieved through TVI and expand to new focus areas including green technologies and alternative and renewable energy sources that will focus on programming in energy-efficient and sustainable technologies with emphasis on geothermal, biomass, solar, and wind.

## **Capacity Building for ESD**

Manitoba teachers have a critical role to play in the promotion of sustainable development. Through their teaching, they influence and help shape young people's values and behaviors. In 2007, Manitoba Education placed a stronger emphasis on



building the capacity of in-service teachers in order to enhance their knowledge of ESD (curriculum, processes, and approaches) and to develop a common understanding for ESD.

ESD training sessions have been conducted throughout the province by Manitoba Education and NGOs, providing educators with information, resources, activities, and initiatives they can adapt and use in their individual schools. For many teachers, ESD was synonymous with environmental issues and the ESD training sessions helped them to understand that ESD is much broader and encompasses economic and socio-cultural issues as well as addressing the learning skills, perspectives, and values of their students. By focusing on capacity building for in-service teachers, this effort is building a community of practitioners who are able to promote and engage their students in everyday sustainable practices, not only in classroom activities, but as a way of life.

As mentioned previously, in 2007 Manitoba Education began offering the Sustainability and Education Academy (SEdA) to provide learning opportunities for senior level officials of schools and school divisions on how to integrate sustainable development into all aspects of the K-12 education system (e.g., governance, facilities and operations, curriculum, teaching and learning, and capacity building). Follow-up post-SEdA meetings have been held with SEdA alumni to share their progress and challenges and a post-SEdA kit and guide has been developed and distributed to facilitate professional development within school divisions along with the DVD "What is Sustainable Development," featuring Chuck Hopkins (see Chap. 2).

SEdA has had a significant impact, since its inception. To date, 26 of the 36 school divisions in the province have attended the SEdA seminar with many school divisions sending new cohorts in successive years to further develop its capacity. School divisions began planning and developing sustainable development action plans and some in creating divisional ESD committees with representatives from each school. Sustainable Development action plans and policies in schools are important as they reinforce sustainability as a "whole school" issue, one that extends beyond the curriculum and addresses the entire planning and management of the school facility. Some school divisions have put in place a part-time consultant in their division to coordinate and support the ESD committees and staff in schools.

In addition to the direct impacts SEdA has had in schools, it has also prompted the creation of a number of strategic partnerships. For example, the Manitoba First Nations Education Resource Centre participated in SEdA in 2008 and since then has developed a partnership with Manitoba Education to enhance linkages between First Nations Schools and the provincial education system in the implementation of ESD. Manitoba Education has another partnership with FortWhyte Alive, one of Canada's pre-eminent sustainable living education facilities. They plan to provide teacher professional development for a program entitled, *Learning to Live Sustainably in an Urban Environment*, as well as developing programs around Arctic Science for students.

Manitoba Education has recently partnered with universities' Faculties of Education in the province to engage in discussion, reflection, and action around preparing teacher candidates to assist students in obtaining the knowledge, skills,

perspectives, and values that will guide and motivate them to work and live in a sustainable manner. In November 2009, Manitoba Education hosted an ESD Seminar for faculty members in partnership with Learning for a Sustainable Future (LSF) and the Deans of Education to explore what ESD means for the Faculties of Education in Manitoba (Buckler & MacDiarmid, 2011b). This was the first time that deans and other faculty members gathered together to discuss ESD. As a result of this seminar, a committee was formed made up of representatives from the Faculty of Education with the task of developing recommendations for the Deans of Education and Manitoba Education to consider. Since its establishment, the committee has met several times to explore issues such as;

- Where is ESD currently taught and expressed within their faculties?
- What classroom practices are teacher candidates learning?
- What research is taking place?
- What gaps and opportunities exist for moving forward on ESD?

The committee members are in the process of developing the recommendations which will be completed by the fall of 2011. Manitoba Education is also working with Faculties of Education to incorporate ESD in teacher education and training by providing preservice ESD teacher workshops. By working together in a collaborative way, this builds upon existing ESD momentum and action within the Faculties of Education.

As chair of the CMEC ESDWG, Manitoba Education is leading a study to develop a better understanding of how Canadian Faculties of Education are incorporating ESD into their pre-service programs, research, and other activities. This is being undertaken in partnership with the International Institute for Sustainable Development and Learning for a Sustainable Future.

## **Facilities and Operations**

Since the development of the provincial Education for Sustainability Action Plan (2004–2008) that directed the first steps in fostering teaching and learning for sustainability in elementary and secondary classrooms, Manitoba schools and school divisions have made considerable progress toward the implementation of ESD in facilities and operations.

Manitoba has approached ESD in K-12 education as a whole school approach, meaning that it is not only about incorporating teaching and learning for sustainable development in the curriculum, but also through sustainable school operations such as integrated governance, stakeholder and community involvement, long-term planning, and sustainability monitoring and evaluation. A large proportion of Manitoba schools have taken significant steps (and continue to do so) to incorporate sustainable development principles into their operations (e.g., energy efficiency, waste management, sustainable transportation, green construction, and water conservation)

and programs (e.g., curriculum development and implementation, teacher professional development, and student project initiatives). A few specific examples include:

- School divisions switching to environmentally friendly cleaning products.
- School divisions revising procurement policies to favor “green” and energy-efficient products.
- Winnipeg School Division recycling and bio-diesel fuel programs.
- Pembina Trails Division sustainable energy and waste management initiatives.
- St. James-Assiniboia School Division development of sustainable development education resource materials.
- Forte La Bosse School Division land and water management environment program.
- “Going Green” business and finance initiatives in Forte La Bosse and Southwest Horizon School Divisions (Manitoba Association of School Business Officials [MASBO], 2009).

The Manitoba Association of School Business Officials (MASBO), which is an association made up of representatives from school divisions focusing on finance, maintenance, transportation, human resources, and technology, created in 2009 a draft position paper on Education for Sustainable Development. The position paper states,

MASBO members must embrace the development and implementation of ESD based programs initiated by teachers as well as those initiated by students. The MASBO membership must be committed to employ practices and environmental measures for the operation of Manitoba School Divisions that will serve to model the sustainable development practices taught in classrooms. Someone has commented that failing that resolve, our greatest critiques will come from our students if and when they see a discrepancy between what is being taught in class and what is being modeled by the leaders of the school divisions. (MASBO, 2009, p. 2)

In April 2007, Manitoba’s Green Building Policy dictated that all new provincially funded buildings, including schools with an area greater than 600 sq. m. (6,458 sq. ft.), need to meet a minimum leadership in energy and environmental design (LEED) Silver certification. Four Schools are currently being built as LEED Silver schools in compliance with the province’s Green Building Policy; some newer schools are being built to LEED Gold standards. For existing schools, the greening of facilities tends to vary greatly from basic recycling programs to comprehensive system-wide green operational initiatives. Other provincial government departments are also supporting school greening of facilities and operations. In 2008, Manitoba introduced a one-time grant ranging from C\$2,000 to C\$70,000 for schools called the “Green Schools Initiative” to support the establishment of new projects that focus on reducing water use, creating learning opportunities around minimizing waste, and supporting school-ground greening and sustainable transportation. In 2010, Manitoba Education partnered with Active and Safe Routes to School to encourage schools to implement sustainable school travel plans. In 2011, the government announced funding to support the greening of outdoor school spaces for new schools being built so that they are both environmentally friendly and can be used as outdoor learning spaces.

## Measuring ESD in Manitoba

In order to determine if the ESD efforts are making a difference in Manitoba, Manitoba Education partnered with the International Institute for Sustainable Development (IISD) on a pilot study in Manitoba to acquire a measure of people's understanding, attitudes, and behaviors concerning sustainable development and ESD. The basic premise is to not only measure the knowledge obtained, but also the attitudes and behaviors of students being surveyed. It also assumed that young people's behaviors are influenced by their knowledge and attitudes. The 2007/08 survey sample for both adults and students demonstrated that this connection exists but that attitudes have greater influence than knowledge. The 2009/10 survey instrument was refined to focus on surveying a statistically relevant sample of Grade 10 students from across the province. Over 1,500 students responded to the survey.

The study suggested that Grade 10 students in Manitoba in 2010 demonstrated the following scores (on a scale of 1–5, with 1 being the highest):

- On knowledge of central sustainable development themes and concepts: 2.12
- On attitudes favorable to sustainable development: 2.14
- On behaviors supportive of sustainable development: 2.83 (Michalos, Creech, & Swayze, 2010, p. 21)

Although the study did identify a number of caveats including the difficulty of identifying those specific behavioral changes required by individuals (especially 15-year-olds) in the interest of sustainable development, the baseline for what Manitoba students know, believe, and do about sustainability (the “head,” the “heart,” and the “hands”) will nevertheless be useful as a starting point against which to assess progress in the coming years. IISD will repeat the survey toward the end of the UN Decade to determine whether ESD activities across the province have led to significant changes in the basic understanding and choices of Manitoba youth. This study will also contribute to our understanding of the overall impact of activities in the UN Decade for ESD.

## Remainder of the UNDESD Decade and Conclusion

In summary, important themes which have supported the development of ESD in Manitoba include the following:

- Manitoba's *Sustainable Development Act* and ensuing policies have created the political space and direction needed to justify the allocation of resources and to move forward with province-wide educational reform.
- ESD is identified as a priority for the province.
- Strong leadership was provided through the Ministry of Education.
- Dedicated staff members were assigned to focus on ESD in the province and resources were provided.

- Partnerships were sought and established to move ESD forward as they permit the sharing of expertise and resources, and help to raise the profile of ongoing initiatives.
- Capacity building became essential. Preservice and in-service teacher training for educators was provided so that they can act as effective facilitators in the ESD process; and the SEdA seminars provided senior level administrators with the knowledge and tools to integrate ESD into their school divisions.
- The Eco-Globe Schools recognition program showcases what is being done within schools and school divisions. Such recognition provides moral support as well as compelling evidence that something can and is being done.
- Funding to support ESD teaching and learning and greening school operations were provided.
- ESD is developed in each jurisdiction according to its unique population/community of schools and individual needs.

Manitoba Education recognizes that ESD is a long-term endeavor, which will continue far beyond the end of the UN Decade. For the remainder of the Decade and beyond, our focus is on sustaining the culture of ESD that has built up over the first half of the Decade, and on creating a flourishing Manitoba where people have developed the knowledge, skills, and values to live more sustainable lives. We will focus over the next few years on continuing to work with our partners to:

- Create further synergy with other government departments to embed ESD across the departments.
- Enhance the capacity of Manitoba educators to effectively integrate ESD into their teaching and school operations.
- Develop and provide needed ESD resources for educators to use in teaching and learning.
- Further engage higher educational institutions toward infusing ESD.
- Celebrate successes through Eco-Globe.
- Develop new schools and improve existing schools based on sustainable design principles.
- Support action-oriented teaching and learning by providing meaningful learning experiences for students so they may bring about informed, positive, sustainable changes.
- Support the greening of school yards and the creation of outdoor classroom spaces.
- Chair the CMEC–ESDWG, the MESDWG and, the United Nations Economic Commission for Europe, Education for Sustainable Development Committee.
- Increase the profile of ESD regionally, nationally, and internationally.
- Host an event at the end of the Decade to celebrate the achievements in Canada on education for sustainable development and to consider how best to continue this good work beyond the decade.
- Measure our progress in ESD.

Manitoba has made significant progress in education for sustainable development since the establishment of the UNDESD. By working together in partnership with our stakeholders to increase our graduation success rate and prepare students to live sustainably, we are helping students set the foundation for higher education, successful entry into the labor force, and brighter more sustainable futures.

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# Chapter 8

## Integrating Education for Sustainability into the K-12 System: A Model from Washington State

Gilda Wheeler

### Background and History: A Big Picture View

A sustainable society is one that is far seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems. (Meadows, 1992)

Washington State has a long and rich history of leadership in environmental education and more recently in education for sustainability, both rooted in a strong ethic of environmental stewardship and social justice. In great part, this ethic owes its origin to the presence of the 29 federally recognized Native American tribes and their cultural history. The indigenous people of Washington have relied on the region's rich natural resource base, including the iconic Pacific Northwest cedar tree and salmon, and have practiced "sustainable living" for centuries.

The state's unique geography contributes to the strong ethic of environmental and natural resource preservation. Washington State includes a highly urbanized "west side" and a productive agriculture-based "east side," roughly divided by the Cascade mountain range. The state has thousands of acres designated as national parks, national and state forests as well as miles of waterways, both fresh and marine.

There are over 50 outdoor and experiential learning centers in Washington State offering youth opportunities to learn in, about, and for the environment. Many of these programs, such as the Olympic Park Institute, Islandwood, and the North Cascades Institute, are nationally and internationally recognized for their innovative and forward-thinking approaches to place-based education and commitment to equity and sustainability.

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G. Wheeler (✉)  
Sustainability and Science, Washington State Office of Superintendent  
of Public Instruction, Olympia, WA, USA  
e-mail: Gilda.Wheeler@k12.wa.us



Sustainability is a common theme in life in the Pacific Northwest. Washington is home to several internationally recognized businesses and industries with a sustainability focus. In addition, Washington has several leading social justice and global health organizations. There is also a robust and growing sustainable food and community garden movement across the state.

The focus on environmental education and education for sustainability was not the result of a radically different education structure. Washington State's education landscape is not unlike many other states in the U.S. There are 295 districts and approximately 2,300 public schools in the state, serving just over one million K-12 students (Office of Superintendent of Public Instruction. State of Washington [OSPI], 2011a). The state education agency develops content standards and state assessments and provides support primarily in the form of professional development to implement the standards and assessments. Washington is a "local control" state in which districts retain a fair amount of autonomy, especially in the area of curriculum adoption. In addition to federal and state funding, Washington's public education system is partially funded through state-owned timber lands. As with other states, Washington faces significant budget issues, which have adversely impacted state funding for education.

## **Systems Thinking Principles Inform the Work**

Washington State policy-makers, higher education faculty, state education agency staff, non-profit community-based organizations, teachers, and school administrators use a systems thinking approach to develop and scale a statewide system for education for sustainability. Acknowledging that systems thinking is, in itself, rich with complexity and nuance, there are a few key systems thinking principles that have been particularly useful for informing the work in education for sustainability in Washington:

- A big picture view—developing awareness by seeking to understand the big picture.
- Different perspectives—increasing understanding by changing perspectives.
- Structure generates behavior—recognizing that a system's structure generates its behavior.
- Leveraging for success—using understanding of system structures to identify possible leverage actions.
- Monitor results and change actions—monitoring and evaluating the behavior of the system, and taking action when needed to assure that the system continues to produce the desired results.
- Current reality and desired vision—holding both the current reality and desired vision for the future, and recognizing that creativity stems from this tension.



## Structure Generates Behavior: Education for Sustainability in Washington State

Washington's legacy of environmental and natural resource education in the K-12 curricula continues to exist today because it is an integral part of the state Office of Superintendent of Public Instruction (Office of Superintendent of Public Instruction [OSPI] 2011b). OSPI has had a statewide environmental education program since 1948, with dedicated federal funding and state staff for the program from 1967 until 2002. In 1990, the State Board of Education created a rule defining environmental education as part of basic education and mandating its instruction in public school at all grade levels in all subject matters. Washington Administrative Code 392-410-115, Subsection (6) reads:

instruction about conservation, natural resources, and the environment shall be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment. (WAC 392-410-115 Mandatory areas of study in the common school, 1990)

Funding for the environmental education program was cut in 2002, at which time OSPI conducted a study to assess the educational needs for such a program in the light of state and federal requirements, as well as the expressed needs of the students, educators, businesses, and communities throughout the state. Based on this research, in 2005, the state legislature funded the establishment of a smaller and more integrated program at OSPI, which was called *Education for Environment and Sustainability*.

The mission of the OSPI *Education for Environment and Sustainability* program is to support academic success and lifelong learning, and to develop a responsible citizenry capable of applying knowledge of ecological, economic, and sociocultural systems to meet current and future needs. The program has a number of charges that include

- Coordinating statutory and regulatory obligations that mandate instruction about the environment.
- Participating in overall efforts to improve student achievement by engaging them in meaningful instruction that helps them to develop deep understanding of the total environment and their place in it.
- Complementing efforts to ensure all students achieve at high levels.
- Inspiring the practice of sound principles of stewardship and sustainability in communities throughout the state.

## Monitoring Results and Changing Actions: Policies for Education for Sustainability

How do we love all the children of all species for all time? Not just our children. Not just our species. Not just now. All the children, of all species, for all time. (McDonough, 2006)

The heart of education for sustainability is providing relevant and engaging learning experiences for youth. Washington State recently developed policies and programs to integrate sustainability into K-12 standards, curriculum, assessment, and campus facilities. These key policies are discussed in the following section.

### ***K-12 Integrated Environmental and Sustainability Learning Standards***

In 2009, OSPI adopted Washington State K-12 Integrated Environmental and Sustainability Learning Standards (*Education for Environment and Sustainability, 2009a*) describing what all students should know and be able to do to be environmentally and sustainability literate. Consistent with the intent of the rule governing environmental education in Washington State, these standards are intended to be integrated into core content areas and across all grade levels. These standards comprise three broad overarching strands that are specific to environmental and sustainability education:

#### **Standard 1: Ecological, social, and economic systems**

Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.

#### **Standard 2: The natural and built environment**

Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.

#### **Standard 3: Sustainability and civic responsibility**

Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability. The Washington State K-12 Integrated Environmental and Sustainability Learning Standards include a detailed alignment with Washington's science and social studies learning standards. Environmental and sustainability education also serves as a meaningful and engaging context for mathematics, reading, writing, communications, the arts, health and fitness, and world languages. The standards document includes a broad-scale alignment with these other important content area standards.

The process for developing the standards involved a review of existing state, national, and international environmental education and education for sustainability standards. The review and report (OSPI, 2008) were developed by Facing the Future, a national nonprofit global sustainability education organization located in Seattle (see Chap. 13). The standards were drafted by a committee of teachers, administrators,

higher education faculty, and informal educators. Following review by various stakeholder groups and national and state content experts, the standards were approved by the state superintendent of public instruction in 2009.

## **Leveraging for Success: Education for Sustainability in Teacher Preparation Programs**

Approximately 4,000 new teachers are prepared each year through the 21 approved teacher education programs in Washington State ([Professional Educators Standards Board \[PESB\], n.d. a, n.d. b](#)). Recognizing the need for teachers who are well-prepared to teach education for sustainability, within the past few years, Washington State has established transformative policies regarding the preparation of new teachers and the continuing professional development for existing teachers.

### ***Residency Certification: The Preparation of All New Teachers***

Washington, like many states, has a two-tiered teacher licensure process. Teachers earn the first tier—Residency Certification—during the preservice phase of their professional preparation. In addition to the Residency Certification, teachers also acquire one or more endorsements that address their grade range or content discipline specialization. New teachers then continue to engage in professional development work to earn the Professional Certification between their third and fifth year of contracted teaching. All new teachers prepared in Washington are required to meet the residency certification standards.

In 2007, the Washington State Professional Educator Standards Board, which has oversight of teacher licensure, passed a program approval standard defining the teacher knowledge and skills at both the Residency and Professional levels. This new standard includes, among several competencies, a requirement that all of Washington's teacher preparation programs provide evidence that beginning teachers are able to prepare K-12 students "to be responsible citizens for an environmentally sustainable, globally interconnected, and diverse society" (Program Approval Standards-Knowledge and Skills, 2011). To enact this standard in classroom practice, beginning teachers in Washington are expected to consider student learning in the context of social, political, environmental, and economic systems. In 2010, the program approval standard was revised to better facilitate implementation in preservice teacher education programs and the PESB reasserted its support for the language, focused on preparing sustainability-literate teachers.

## ***Environment and Sustainability Education Endorsement***

In 2008, the PESB authorized the creation of a new category of teacher endorsement—the Specialty Area Endorsement—which offers teachers and preservice teacher candidates the option of earning an additional endorsement in a specialized area. In 2009, the PESB approved the Environmental and Sustainability Education Specialty Area Endorsement—one of the first under this new category.

This new endorsement was designed to ground a teacher fully in environmental and sustainability content and methods including utilization of systems thinking, project-based learning, and place-based field studies. The specialty area endorsement in Environmental and Sustainability Education is intended to create new roles and leadership opportunities for teachers; offer students new opportunities for learning; (e.g., senior projects related to environmental and sustainability concepts); and encourage interdisciplinary teaching. As of 2011, six teacher education institutions were approved by the PESB to offer the new endorsement, and it is anticipated that more institutions will seek approval for the Environmental and Sustainability Education Specialty Endorsement.

## ***Sustainability in Washington State School Facilities and Operations***

In 2005, Washington State Governor, Christine Gregoire, signed the “high-performance public buildings bill” into law, requiring that state-funded facilities, including K-12 schools, be designed and built to high-performance or “green” building standards. All major facility projects of public school districts receiving any funding in a state capital budget must be designed and constructed to at least the leadership in energy and environmental design (LEED) Silver standard or the Washington Sustainable Schools Protocol (WSSP). The WSSP is the district planning tool for green school design. Based on the Collaborative for High Performance Schools Green Building Standards, WSSP allows designers to plan a high-performance school while considering the regional, district, and site-specific possibilities and constraints for each project.

The WSSP mandates requirements for all new school construction and major remodels to adhere to a set of sustainability design features. From construction materials to energy efficiency, the protocol provides detailed requirements for all state funded school construction projects with a goal of sustainable school facilities and operations.

## ***Current Reality and Desired Vision: Washington State Environmental and Sustainability Literacy Plan***

The most recent policy effort promoting education for sustainability is the 2011 Washington State Environmental and Sustainability Literacy Plan (Plan). OSPI and the Environmental Education Association of Washington (EEAW) led a group that

included multiple stakeholders through the development of the Plan. The purposes of that plan include:

- Build on and leverage environmental and sustainability education programs and initiatives already underway in Washington State.
- Ensure that students in Washington have ample opportunities to increase their environmental and sustainability literacy, while enhancing their academic achievement through real-world, integrated, project-based learning.
- Ensure that Washington State is well-positioned to obtain private and public funding to support this important work.

Broad statewide input was gathered through focus groups and online survey, ensuring that the Plan represents the range of expertise and perspectives unique to Washington State. A statewide steering committee that included classroom teachers, school administrators and directors, teacher educators, regional professional development providers, informal educators, natural resource agencies, state education agency content and assessment experts, students, parents, business leaders, and tribal and other community partners provided guidance throughout the development of the Plan. The final Plan was adopted for implementation by the Superintendent of Public Instruction in June 2011. OSPI, EEAW, and the growing network of sustainability education providers, supporters, and advocates are implementing the goals and strategies of the Plan.

## **From Policy to Implementation**

With foundational policies and processes in place for K-12 and teacher education, Washington turned toward implementation strategies and initiatives to embed education for sustainability into the K-12 curriculum. The next section includes some of the programs developed in Washington State and examples of their implementation.

### ***The Sustainable Design Project: A Curriculum Model for Integrating Sustainability into K-12 Classrooms***

The Sustainable Design Project is a public-private partnership developed in 2005 by OSPI, the EEAW, and Puget Sound Energy. The goal of the Sustainable Design Project is to engage students in designing solutions to real-world issues within the context of systems and sustainability. The project addresses two overarching and critical issues: (1) unprecedented environmental, social, and economic challenges and (2) a growing academic achievement gap for disadvantaged students. It is predicated on the belief that every student should benefit from the rich learning and developmental opportunities inherent in creating a healthy environment, an equitable society, and a vibrant economy.

The Sustainable Design Project provides the structure and support to connect businesses, industry, higher education, and community organizations to the K-12 learning process. By offering students the chance to solve real-world problems through interdisciplinary project-based learning, the Sustainable Design Project captures and builds upon the imagination and creativity of students, teachers, and community members. In providing resources and tools linking active, hands-on learning to core content standards, it allows students to work together with experts in their communities to solve these problems and become active participants in creating a positive, sustainable future.

Key principles guiding Sustainable Design Projects include:

- Consideration of whole systems, addressing the interconnections between ecology, economy, and society.
- Authentic student engagement and cooperative group learning.
- Alignment with core content standards (e.g., science, social studies, arts, mathematics, and language arts).
- Connection with community resources and stakeholders' perspectives.
- Design of a solution to a real-world challenge.
- Plan to implement the design solution and, if feasible, the actual development of the product or service.
- Sharing of the project.
- Evaluation and assessment of student and project impacts.

Through a 2-year partnership with the federal Learn and Serve America grant program (2009–2011) and a 1-year grant from EPA (2010), a cohort of lead teachers and administrators from across the state are using the Sustainable Design Project framework with their students, while also engaging additional teachers in their school and district in this project-based learning model. One such school that has framed their school theme around sustainability and project-based learning is Komachin Middle School. Box 8.1 provides a description of how Komachin Middle School has implemented the Sustainable Design Project.

### **Box 8.1** Highlight Komachin Middle: A Whole School Approach to Sustainability Education

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Komachin Middle School, located in South Puget Sound, serves over 700 students. The school is economically and ethnically diverse; 35% receive free and reduced meals and the student demographics are 59% White, 13% Black, 11% Hispanic, 11% Asian, and 2% American Indian/Alaskan Native.

Komachin's "whole school" model is grounded in four core values: (1) sustainable communities; (2) building strong relationships with middle school students; (3) engaging students by connecting meaningful, real life experiences to their learning; and, (4) time dedicated to ongoing staff professional development and team collaboration.

(continued)

**Box 8.1** (continued)

The school is organized by integrated “houses” which act as smaller schools within the larger school, allowing integration of program and student connections across all content areas. The school also runs on a block schedule that allows for peer collaboration, project-based learning, field experiences, service learning, and strong community connections.

With the overarching school theme of sustainability, the science program focuses on sustaining living systems during the life science year and sustaining natural resources throughout the physical science year. School-wide projects and integrated field experiences are part of both years which includes student visits to three local ecosystems: freshwater salmon spawning rivers; Puget Sound; and a forested park.

All students participate in the “Green School” initiative. Their first inquiry experience is focused on recycling with the end product being a presentation to educate and motivate staff and students in small group settings about the “all school” recycling program that has been in place for the past 8 years, and the “Food to Flowers” school lunch composting program that was more recently implemented. Students use technology to communicate and educate their peers including analyzing and grading classrooms based on the amount of recycled materials found in the garbage, developing videos to be shown over the school network, and designing hallway posters.

An important value instilled in Komachin’s students around sustainability is to serve the needs of the local community through service. During the spring, summer, and fall, students grow fresh produce in their school garden and donate it to the local food bank. In addition, all students participate in a school-wide “Martin Luther King Day of Service” in which students fan out in the community to serve in 30 different projects ranging from planting trees to tutoring in a local elementary school.

All students study and problem-solve the global issue of excess carbon dioxide in the atmosphere using solar cells to experiment with heating water, designing solar ovens to cook marshmallows, and inventing a system that can purify muddy water using solar energy. In 2011 students competed to design their “Dream Green House” that incorporates LEED (Leadership in Environmental Design) principles of sustainable site, water efficiency, energy and atmosphere, materials, and interior environment. Students also competed to create the most efficient windmill blade design.

Komachin’s Principal, Joyce Ott, sums up the school’s philosophy with this statement, “Our goal is for all our students to develop into creative problem solvers and critical thinkers. Connecting students to each other and to their community through integrated curricular classroom and field experiences and through service and stewardship is key to engaging and inspiring our students to make a difference today and beyond”.

## ***CTE Green Sustainable Design and Technology Course***

In 2008, OSPI's Career and Technology Education division developed a year-long middle and high school course called "Green Sustainable Design and Technology" (OSPI, 2009b). The purpose of this exploratory course is to provide students with knowledge of career opportunities in the new green economy. Exploratory courses are described as "a little bit about a lot"; in other words broad exposure to a range of career opportunities. Preparatory courses, on the other hand, are designed to be "a lot about a little"; in other words, the deeper knowledge and skills a student needs to attain a high level of expertise in the chosen career path.

The Green Sustainable Design and Technology course content includes:

- Principles of sustainability,
- Impact of human activities on sustainability,
- Sustainable transportation technology and systems,
- Sustainable power generation technology and systems,
- Sustainable resource, materials, and waste management,
- Sustainable agricultural systems,
- Sustainable ecosystem management,
- Sustainable design and construction,
- Sustainable manufacturing practices,
- Healthy homes and communities,
- Sustainability in the work place,
- Students' role in building sustainable communities, and
- Postsecondary career paths in sustainability.

As of June 2011, the Green Sustainable Design and Technology course was being offered in 24 districts across the state. An excellent example of this course can be found at the Secondary Academy of Success high school in the Northshore School District. In addition to this exploratory course, the Career and Technology Education division of OSPI has redesigned several preparatory courses to include a green sustainability focus (Box 8.2).

## ***Teacher Professional Development: Sustainability Education Summer Institute***

Acknowledging the critical need for high-quality professional development around education for sustainability, the Sustainability Education Summer Institute (SESI) was established in 2009. SESI, now an annual event, is held at Islandwood, a LEED-designed environmental learning center on Bainbridge Island, in the Puget Sound region of the state. SESI was designed through a collaboration of Western Washington University, Islandwood, and the state education agency (OSPI). The development of



**Box 8.2** Highlight: Enviro+Tech+Design Course of the Secondary Academy of Success

The Green Sustainable Design and Technology course called “Enviro+Tech+Design” is offered at the Secondary Academy of Success (SAS) High School in the North Shore School District, located in Bothell Washington. The Enviro+Tech+Design course relies heavily on a variety of community partnerships such as *McKinstry*, an international “design, build, operate, and maintain building” firm located in Seattle, and *21 Acres*, a non-profit organization and community farm supporting sustainable agriculture.

The Enviro+Tech+Design course is grounded in integrated, project-based, and systems-focused learning. SAS is housed in a redesigned warehouse in which sustainability is literally built into the building which makes it the perfect “sustainability learning laboratory” from which the students span out to their community and homes.

Students spend the first half of the year going an inch deep on a variety of areas (e.g., buildings, transportation, energy, consumer products, and ecosystems) pertaining to sustainability and then spend the second half of the year developing their capstone project around one of those main areas that interests them the most and of which they have a thirst to learn more about.

They take those projects to “Imagine Tomorrow” a high school competition sponsored by Washington State University, where they can vet their real ideas to real industry professionals. The course is articulated with a local college, so the students can get college credit for the course.

“It really comes down to a group of students signing up for a course that will help them understand their planet better and help them become good stewards of their natural environment and good designers of their built environment—in essence, finding a way to blend the two harmoniously.” says Mike Weirusz, the course instructor (M. Wierusz, Personal communication, June 1, 2011).

SESI was supported by funding from the Russell Family Foundation, Weyerhaeuser, Boeing, and the Environmental Protection Agency. This funding demonstrates the broad basis of support for education for sustainability among the philanthropic, business, and public institutions. The 3-day institute brings together sustainability experts, K-12 educators, college of education faculty, and students with the goal of deepening the knowledge and skills around effectively integrating sustainability into schools.

There have been several positive outcomes resulting from the summer institute. Two of these outcomes are of special note. One is the development of the Washington

Sustainability Education social network site on the NING social networking platform,<sup>1</sup> which continues to grow and provide a forum for discussion and exchange of ideas. The other positive outcome is the formation of a Diversity and Sustainability Education Coalition with the purpose of developing strategies and action plans to promote the intentional inclusion of people of color in the work of sustainability education in Washington State.

SESI continues to nurture a growing community of sustainability practitioners each year. Building on the success of SESI, there is growing interest in developing a similar event in Eastern Washington.

## **Leveraging for Success and Going to Scale: National Policies and Initiatives**

Although in many ways Washington State exemplifies the pioneer spirit, for better or worse, progress was not made without the growing attention and support for education for sustainability on the national front. Initiatives are emerging around the country as educators are recognizing the need to reorient education systems to meet the opportunities and challenges of this century.

### ***Sustainability Education Summit and Reauthorization of ESEA***

In 2010, the first ever U.S. Sustainability Education Summit was held in Washington, DC. The U.S. Secretary of Education gave a powerful address stating that,

this sustainability summit marks a new milestone for the U.S. Department of Education. Until now, we've been mostly absent from the movement to educate our children to be stewards of our environment and prepare them to participate in a sustainable economy. That work is taking hold in corporations, in other agencies of the federal government, as well as colleges, universities, and schools across the country... Today, I promise you that we will be a committed partner in the national effort to build a more environmentally literate and responsible society. (Duncan, 2010)

Further demonstrating their commitment to education for sustainability, the Obama Administration and the U.S. Department of Education recently included environmental literacy in the President's blueprint for the reauthorization of the federal Elementary and Secondary Education Act (ESEA) as a key component of a "well-rounded education."

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<sup>1</sup> Ning Inc. <http://about.ning.com/>

### ***Green Ribbon Schools Challenge Program***

In April 2011, the Department of Education, the Environmental Protection Agency, and the White House Council on Environmental Quality launched the U.S. Department of Education Green Ribbon Schools Challenge Program (Ed. Gov Blog. U.S. Department of Education, 2011). The program is modeled after the successful Blue Ribbon Schools program that honors high performing schools and schools that have made significant gains in meeting the needs of disadvantaged students. The Green Ribbon Schools Challenge Program provides incentives and recognition for K-12 schools that take exemplary steps toward creating healthier, environmentally sustainable learning spaces and infuse environmental literacy into the curriculum. The program is also intended to enable collaboration between federal, private, and nonprofit initiatives to most effectively support schools in their Green Ribbon challenge.

### ***Council of Chief State School Officers EdSteps Global Competence Work Group***

Another promising initiative on the national front is the Council of Chief State School Officers (CCSSO) EdSteps and Global Competence project, launched in 2009 (Boix-Mansilla & Jackson, 2011). Global competence is defined as the “capacity and disposition to understand and act on issues of global significance.” During the development of this project, CCSSO staff recognized that sustainability literacy was an essential element of global competence and consulted with a number of experts in education for sustainability, including one such expert from Washington State. CCSSO is currently collecting student work that demonstrates global competence. Although this initiative is still in its infancy, this focus from the national association representing all state education agency directors has promising and potentially far-reaching implications for embedding sustainability concepts and understandings into K-12 assessments. In Chap. 12, Crocco and coworkers provide an extended example of a strategy for using the CCSSO global competency work in social studies education.

### **Systems Thinking and Networking for Change**

Life, from its beginning more than three billion years ago, did not take over the planet by combat but by networking. (Capra, 2008)

The Washington model for developing and promoting education for sustainability in K-12 schools and teacher education programs exemplifies the power of a systems thinking and networked approach to change. Washington’s success is

grounded in historical, cultural, economic, and political support for education for sustainability. The state developed a few key policies in regard to teacher education and student learning standards. Programs and initiatives then flourished from these policies to implement education for sustainability in the K-12 system.

As education for sustainability goes to scale in the USA, the work underway in Washington can serve as an “off-the-shelf” template for other states and organizations. Leveraging the work of existing education systems and initiatives in Washington is a key component in our success. Finding those common interest spaces and building on the existing networks rather than competing for a place at the education table is at the heart of education for sustainability initiatives.

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## Chapter 9

# Teaching and Learning Toward a Sustainable Future: The Sustainability Academy at Lawrence Barnes

Jen Cirillo and Anne Tewksbury-Frye

*On a crisp fall morning in Burlington, Vermont, a group of second and third grade students set out from their school on North Street for a field trip back in time. The students arrived at what was once the Russian-Jewish bakery, established in the 1800s by a family of Lithuanian immigrants. Down the street, another group of students headed out in the opposite direction, in search of the once essential trolley car heading downtown. A third group fanned out to explore Hyman Bloomberg's Shoe Store, while another headed toward the water, to the site of the Lake Champlain lumber port. While none of these businesses are still operating in present-day Burlington, they came back to life on this blustery afternoon. The historical reenactment of North Street's heyday was made possible by community volunteers. Students were able to speak with the bakers and shopkeepers, the recent immigrants, and the laborers of their neighborhood. The characters told the stories of their own immigration, migration, and settlement, described daily life, and answered questions from curious eight-year-olds, who wondered things like, "What does it mean when the sign says, 'No Irish Need Apply?'" Students filled their "passports" with stamps as they journeyed from a scene of workers at the lumberyard, to the home of textile workers, to a conversation with a French Canadian nurse. This thoughtfully orchestrated "learning journey" allowed students to deepen their understanding of the big idea of "change over time."*

*Imagine yourself as one of those students, where wonder drives your learning. You ask questions about your place as you explore the world around you. Ideas are*

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J. Cirillo (✉)

Shelburne Farms' Sustainable Schools Project, Shelburne, VT, USA  
e-mail: jcirillo@ShelburneFarms.org

A. Tewksbury-Frye

Sustainability Academy at Lawrence Barnes Elementary School,  
Burlington, VT, USA  
e-mail: atewks@bsdvt.org

*planted like seeds, and nurtured by collaborative inquiry of fellow students, teachers, and community partners. Neighborhoods and schoolyards become the classroom, and the walls of the school become permeable. This is the kind of learning happening every day at the Sustainability Academy at Lawrence Barnes.*

## **The Sustainability Academy at Lawrence Barnes**

The Sustainability Academy at Lawrence Barnes is the United States' first sustainability-themed elementary magnet school. This chapter outlines the history of the school's transformation and lessons learned throughout this process. The Sustainability Academy at Lawrence Barnes is a small public elementary school located in the Old North End of Burlington, Vermont. In 2009, the school, formerly known as Lawrence Barnes Elementary School, reopened its doors as the country's first kindergarten through fifth grade public magnet school<sup>1</sup> with a sustainability theme. Today, the school is sustained by a collaborative partnership that includes families, many local community partners, Shelburne Farms, and the Burlington School District. The school engages young citizens in making a difference in their community by exploring social, economic, and environmental issues through an integrated, hands-on curriculum steeped in service learning.

As the lead community partner, Shelburne Farms, a nonprofit sustainability education center, provides primary support in the transformation of the Sustainability Academy. Shelburne Farms' Sustainable Schools Project (SSP) staff members provide embedded professional development, curriculum consultation, and collaboration on rethinking the education system, so that young people can become socially, ecologically literate, caring citizens who make choices that create a healthy and just world.

### ***History***

The Lawrence Barnes Elementary School began serving Burlington's North End community in the late 1880s, relocating to its current site after a fire in 1958. The school had been slated to close for a variety of reasons over the years; most recently, in 2006, when the Burlington School Board was concerned about two related issues: the combination of an exceptionally high concentration of low-income students, and identification as a "failing school" under the 2001 No Child Left Behind Act (2008). The School Board's recommendation to close Lawrence Barnes and redistribute its students was one of several options to address the city-wide socio-economic disparity

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<sup>1</sup>Magnet schools are public schools with a specialized curriculum focus. The term "magnet" refers to the expectation that a magnet school will attract students from across traditional neighborhood or district boundaries to serve a more diverse student population. For example, magnet schools often are designed with the intention of increasing racial, language or socioeconomic integration within a school district.

among the district's six elementary schools. This suggestion was met with outrage by the school's families and community who gathered forces, called the press, and refused to abandon a school that has long been considered "the heart" of the neighborhood. Their protests resulted in the School Board's formation of a task force to propose alternatives to closing schools. The task force was comprised of parents, teachers, administrators, and community members.

The task force on removing obstacles to the success of students from low-income families (Burlington School Board, 2006) was charged with "recommending an approach or combination of approaches, to further the achievement of students from low-income families." After several months of studying local and national models, the Task Force concluded that all students in a school with a mixed socioeconomic population fared better, especially in terms of academic achievement. Based on these findings, they recommended six alternate strategies to better serve the educational needs of low-income students, while honoring the rich diversity of Burlington's population. Possibilities included reconfiguring the elementary schools throughout the city to separately serve kindergarten to grade 2 and grades 3–5, respectively, redistricting the city Wards that dictate which school a student attends, or the option of creating magnet schools. The School Board ultimately decided to establish two elementary magnet schools, which would attract higher income families from around the city into the Old North End schools, bringing into balance the socio-economic demographics. The School Board then sought input from the community on potential themes and innovative programs that would attract new families to the magnet schools—the state's first.

### *Why a Sustainability Theme?*

Vermont has a longstanding tradition of practicing land stewardship and community sustainability. In 2000, the State of Vermont's Department of Education formally recognized this value when it included two new academic standards that apply to every student, in every subject, from kindergarten through 12th grade—Sustainability (3.9), and, Understanding Place (4.6)—into its Framework of Standards and Learning Opportunities. Shelburne Farms played a lead role in the partnership that worked on the development of these new learning standards. Both of these standards, found in the Vital Results section, address what Vermonters felt was missing in preparing students for the twenty-first century. Vital Results are learning standards that cover every subject and grade level.

While adding these new standards greatly enriched the existing framework, it became clear that teachers needed professional development and resources to effectively teach the content and ideas found in both of the new standards. To meet this need, Shelburne Farms began offering training for teachers, developing curricular resources, and supporting teachers in using sustainability and the local community to integrate school curriculum, projects, and district efforts (Box 9.1).

Shelburne Farms launched an innovative whole-school professional development model called Sustainable Schools Project (SSP) in 2001, defining sustainability as

**Box 9.1** Shelburne Farms and the Sustainable Schools Project

Shelburne Farms is a nonprofit education organization and National Historic Landmark, established in the late 1800s. The Farms' mission is to cultivate a conservation ethic for a sustainable future. The vision that informs the work today took shape in the 1970s when the Farm began its environmental and agricultural education programs.

Since that time, the organization has served as a local and international model in education. The Farm partners with organizations, government agencies, and institutions locally, nationally, and abroad to advance education toward creating a healthier and more sustainable society.

In 2001, Shelburne Farms started its Sustainable Schools Project (SSP) answering the need for professional development in pedagogies and practices that support understanding of sustainability and for a whole-school model of implementing the practices and concepts of sustainability. With the support of local and national foundations, SSP began working with K-12 teachers and developed their framework for Education for Sustainability (EfS).

The Framework suggests that students should understand that the world is interconnected, that they should know the natural and human communities in which they live, and have opportunities to make a difference or build a sense of self-efficacy. This framework has been the foundation for the partnership with the Sustainability Academy. The focus on self-efficacy and a deep understanding of the concepts of community and interdependence has proved to be a way to engage students of all abilities and backgrounds and helps them make the transfer of what they are learning in their place to new and more complex situations.

Shelburne Farms' SSP continues to work with Vermont schools as well as schools throughout the USA from California to New York and around the world from China and Japan to the Dominican Republic.

—*Jen Cirillo*

“improving the quality of life for all—economically, socially, environmentally—now and for future generations” (Sustainable Schools Project [SSP], 2001) The goal of SSP is to use the lens of sustainability to integrate the “4C’s”—curriculum, campus practices, community partnerships, and collaboration. SSP staff began working with the Burlington School District in 2001, building upon the work Shelburne Farms established with the district decades earlier. This enduring public–private partnership is grant-funded, and includes private foundation support.

In 2004, the Sustainable Schools Project launched a new program with the Lawrence Barnes Elementary School to explore possibilities of connecting students to their place and building their sense of self-efficacy in their own community (SSP, 2004). This initial program set the stage for what eventually became the Sustainability Academy at Lawrence Barnes.



Unfortunately, that early program was limited by the traditional public school infrastructure that created challenges such as:

- Little integration of subjects,
- School life and community life being seen as separate,
- A focus on standardized test scores,
- A new reading initiative, and
- Little additional professional development time.

Teachers had to volunteer their own time to work on curriculum, explore community resources, and collaborate with each other. At the same time, they had to meet the requirements of a school that was not meeting Adequate Yearly Progress (AYP) under the No Child Left Behind Act (2001).

With the support of the professional development provided by the SSP, the Lawrence Barnes teachers started with small steps. They looked at opportunities to apply the lens of sustainability to their curriculum, mapped the K-5 scope and sequence, and located the Big Ideas of Sustainability (Shelburne Farms, 2004) in the state education standards. Classroom teachers participated in workshops on sustainability where they met with local resource people such as the director of the Food Shelf hunger relief program, farmers, waste managers, livable wage advocates, and urban planners. They read articles on education for sustainability and place-based education, and analyzed student work for evidence of understanding sustainability concepts.

For 5 years, with the support of SSP staff, the school continued to slowly infuse sustainability into many aspects of their practices. Families began participating in evening programs, such as book groups on sustainability themes, community-wide dinners and wellness programs, which emerged from the traditional Parent Teacher Organization (PTO). Students spent increasingly more time in the community engaged in service-learning projects such as working with the Food Shelf or neighborhood gardening projects.

In 2007, when the search for a magnet school theme began, the early successes at Lawrence Barnes prompted SSP and the City of Burlington's Legacy Project, a citywide sustainability initiative, to present a proposal to the School Board and community to launch the country's first sustainability-themed elementary magnet school. The proposal was supported by the Lawrence Barnes families and community partners, and was well received by the School Board. With great enthusiasm, it was adopted as the school's theme, and the school reopened as the Sustainability Academy at Lawrence Barnes in September 2009.

## **What Makes This School Different?**

The Sustainability Academy differs from many elementary schools in a variety of ways—from its story of transformation to the everyday operations. The Sustainability Academy is guided by a collaborative team of school staff, district leadership, families, and community partners who hold the school and students to high expectations for achieving sustainability goals. In addition, the school, while still part of a larger

school district, has a customized professional development plan that integrates the local resources of the greater Burlington community with teachers' own developing understanding of sustainability. The curriculum is designed or adapted using the Big Ideas of Sustainability so that it meets the needs of individual students. Most notably, the Academy has a full-time Sustainability Coach who is employed by the district to support teachers, families, and community members in pursuing sustainability. In addition, the school continues a long-standing partnership with Shelburne Farms, SSP whose staff pollinates the school with innovative ideas and opportunities from the field of sustainability and place-based education (Box 9.2).

### **Box 9.2** Reflections of a Sustainability Coach

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I began my teaching career 37 years ago, in a small, progressive college town, during the era of "Open Classrooms." Four classrooms were put together in the gym, along with some carpeting, bookcases, children, willing teachers, and a curriculum based on creating the "least restrictive environment for children." It was a grand experiment that lasted 4 years. What it taught me, however, endured: the power of children's voice in their own learning. As I reflect on my varied career in education—from teaching music, kindergarten, starting a private school, teaching for 21 years in Burlington's Old North End, to becoming the Sustainability Coach at the Sustainability Academy—I have never forgotten the importance of children having a "say" in their own education. Teaching children for all these years has meant collecting, embracing, and discarding initiatives, and then moving on to the next one. Through all these changes, I have been fortunate enough to have a large collection of teaching experiences to draw upon, from teaching Woody Guthrie's music to nurturing students to standing up against the closing of their school.

Teaching and coaching at the Sustainability Academy has been the most challenging part of my career because it has demanded the most from me, but it has also been the most rewarding part of my career. I could never return to the old ways of teaching isolated subjects, disconnected from the world. Education for Sustainability is a promise for the future; it is the interconnect- edness and interdependence among ecological, economic, and social systems. It is teaching young children how to make a difference now, and not just when they reach adulthood. It is about living and making a difference today, and it is about linking the knowledge of place and sustainable practices with inquiry and action. Education for sustainability is about improving the quality of life for all...now and for future generations.

Is that more of a challenge than my previous years in the classroom, more demanding than any initiative to date? Of course it is! But its impact is equally significant. Education for Sustainability creates meaning—for teachers, students, families and the community—that lives on beyond the school day and long after children leave the Sustainability Academy.

—Anne Tewksbury-Frye

When SSP began its work with the Lawrence Barnes' community, the faculty had been asking themselves "How can we help students have pride in their place?" As the relationship evolved, they began to embrace a much larger question, "What would teaching and learning look like if the goal was to create more sustainable and healthier communities?" Today, the school and community collectively pursue a vision not commonly seen in public schools. It is one that goes beyond and includes increasing student academic achievement and balancing the socioeconomic ratio of the school.

The Sustainability Academy strives to be a collaborative of educators, families, and the community that infuses the Big Ideas of Sustainability into curriculum and campus practices. The goal is to prepare students to be responsible citizens and agents of change in their own lives, in their own community, and beyond. The staff holds high expectations for academic and personal growth for all students, and embraces the rich economic and cultural diversity of the community. SSP and the Sustainability Academy are engaged in creating a different kind of teaching and learning that meets the individual needs of the students, explores the unique attributes of place, and strives toward sustainability. Based on the SSP's definition, the school redefined sustainability as, "learning the shared responsibility for improving quality of life for all—economically, socially, and environmentally—now and for future generations."

### ***Curriculum: Starting with the Goal of Sustainability***

The essential capacities and habits of mind that students develop in elementary school are essential for understanding the complexity of sustainability. Students, during these foundation years, develop the capacity to understand sustainability principles such as cycles, community, and interdependence and to build habits of mind including multiple perspectives and systems and critical thinking. These capacities and habits of mind form the Big Ideas of Sustainability that lead to a more comprehensive understanding of an ever evolving concept. Therefore, from the start, the Sustainability Academy focused on creating its own curriculum and a customized professional development program for teachers. The Big Ideas of Sustainability that teachers identified in 2004, and used to design their curriculum, have endured. Today, teachers in each grade level continue to orient their units of study, year-long essential questions, and service-learning projects around these themes. These include *community, cycles, interdependence, systems, responsibility, diversity, and equity*.

The process of curriculum development at the Academy has been based on the Understanding by Design (UbD) framework (Wiggins & McTighe, 1998), which has been a powerful part of the experience for the teachers and students. The UbD framework encourages teachers to begin the instructional planning process by identifying the desired outcomes—the knowledge and skills students will acquire as a result of instruction. After those desired outcomes are identified,

teachers design lessons and activities to help students acquire that new knowledge. The Sustainability Academy begins with the end goal of healthier and more sustainable communities, and then identifies skills, content understanding, and values students need to meet that goal. Designing this type of curriculum is a major endeavor; but the faculty has found the process to be satisfying. As one fourth/fifth grade teacher said, “I’ve never worked so hard; but it has never been so worth it.”

The UbD process involves creating instructional units in a long-term planning process. At the Sustainability Academy, the units of study are continuously evaluated, refined, and questioned during curriculum retreats held three times a year. In addition to regular weekly meetings, grade-level teams meet for a full-day retreat with the support of the Sustainability Coach, SSP staff, and other resource specialists, to work on curriculum maps. They also infuse the themes of sustainability onto district initiatives; such as *Readers and Writers Workshop*, *Inquiry Science*, and *Positive Behavior Interventions and Supports*. They create formative and summative assessments that evaluate students’ understanding of sustainability concepts, content knowledge, and skills, as well as continuing to administer traditional measures of student achievement.

The school uses SSP’s Framework of Education for Sustainability (Shelburne Farms, 2001), which states that to be able to create sustainable communities, students should: understand that the world is interconnected (systems-thinking), know the human and natural communities of which they are a part (place-based education), and understand that they can make a difference (service-learning). Following this framework, the school has put an emphasis on project-based, service learning, and place-based learning. These approaches provide opportunities for students to develop skills, such as teamwork, public speaking/communication, problem solving, and decision-making.

Anecdotal evidence from school staff, community partners, and school leadership suggest that all students, including the significant populations of English language learners and special education students, are engaged and are generally doing better in school than prior to incorporation of the sustainability theme. Initial evaluation of the impacts of place-based education also indicate that English language learners become fluent in English more quickly when they are learning about local phenomena and are engaged in hands-on learning.

## **What Does Education for Sustainability Look Like in an Elementary School?**

Developmentally, most 5-year-olds lack the integrated reasoning skills to fully understand complex issues such as the systems involved in climate change or the factors that threaten rainforests. Yet, many programs for young children are structured around global environmental catastrophes. According to Sobel (2004),

teaching young children about these threats and tragedies before age 10 can instill in them a fear of, rather than love for, the planet.

For students to develop a connection and compassion for the world, they must first experience and explore its wonders in a developmentally appropriate way. The curriculum at the Sustainability Academy provides students with firsthand experiences that connect them to the natural world that sustains them—the food, the fiber, the green places. As their affinity for the world around them deepens, they become stewards and agents of change. As the descriptions below illustrate, the curriculum is integrated across all six grade levels.

### ***Kindergarten and First Grade***

In kindergarten the children focus on a year-long theme of community. They explore who and what makes up a community, how these communities are dependent on each other, and how they can help the natural and human communities in their neighborhood. On Friday mornings, regardless of the weather, they head out to their “Outdoor Classroom,” past the playground and the sandboxes, and arrive at the “Food Forest,” where fruit bearing bushes and trees grow.

In their “Explorer Backpacks,” they carry field guides, a journal, water, and science tools for up-close viewing. The treasures found in the schoolyard include earthworms, insects, and newly formed blossoms they cannot yet identify. Hands dig under the leaves looking for new things to investigate or bring back into the classroom. They sit down on tree stumps, sketching out the details of their latest discovery. In addition to learning about their community, the students are discovering the world and developing the understanding that what they learn in their own schoolyard can prepare them for larger and more complex communities.

The first-grade students build on their understanding of communities as they begin to study cycles. Each spring in Vermont brings maple-sugaring season. Sugar makers tap the maple trees and collect sap during a brief window of “just right” conditions that usually lasts about 6 weeks. Sugar makers depend on this spring crop to help carry them through until the next year. The first graders at the Sustainability Academy learn about the Vermont maple sugaring process as part of their year-long theme of cycles.

On the final day of this unit of study, classrooms and halls are filled with the fragrance of maple treats, baked by children to sell at the Maple Festival. The rooms are abuzz with older students who have come to the festival, where first graders demonstrate and act out the steps of the sugaring process. Other students hold a syrup taste-test, share sugaring legends, and paint maple leaves on attendees’ faces. As part of this unit of study, students also learn about the link between the natural and economic cycles in the maple industry, by exploring student-generated questions like: “What happens after the syrup is made?”; “How does the farmer sell it?”; and “Who gets the money?”

## ***Second Through Fifth Grade***

At the Sustainability Academy, multiage classrooms in the second and third and the fourth and fifth grades allow students to build deep relationships with their teacher, and for the curriculum to spiral from year to year. These upper elementary students focus on building their understanding of the Big Ideas of systems, interdependence, equity, responsibility, and diversity.

In second and third grade, students explore the theme of systems and interdependence, including units on ecosystems and (human and natural) community change over time. Students also spend 6 weeks studying the systems of the human body and health issues associated with those systems. They culminate their exploration with a collaborative research project of their choice, and then share their learning with families and community members during the “Health Fair.”

The hallways are lined with student-staffed booths piled with surveys, pamphlets, give away items, and experiments and challenges. Students display their knowledge and educate the public on topics such as: “Which is better for you, bottled water or tap water?”; “What are the best hair products for your hair and why?”; “Why is it so difficult to stop smoking?”; or “When is chewing gum good for you?”

By fourth and fifth grade, students have practiced stewardship on campus and around the city and immersed themselves in learning how different communities address environmental and equity issues such as food access, immigration, and water quality. They have become active citizens who understand how local government works, and how to successfully use their voice to effect change.

One year, fourth and fifth grade students at the Sustainability Academy met weekly with peers from Champlain Elementary School in a project they titled, “Cross Town Communities.” All together these 150 students worked to make their neighborhoods and the city a better place to live. Their inspiration for this unit was a guide written by Shelburne Farms called, *Healthy Neighborhoods/Healthy Kids* (Shelburne Farms, 2007).

Students worked in small groups on self-selected topics from the “Quality of Life Index” created at the launch of the project. They developed report cards used to check their neighborhoods’ safety, health of green and play places, water and air quality, and community access to essentials such as healthy food. They took on adult-caliber challenges, such as handicap accessibility of the city’s schools where they played an integral role in getting a ramp and elevator installed at the middle school. They created sketches to lobby the Department of Public Works for wider sidewalks and additional speed bumps to slow traffic. One group compared small markets in a neighborhood to assess the availability of fresh fruits and vegetables to families without transportation. At the end of the school year, these 9 and 10-year-olds held a community-wide exhibition at City Hall sharing their work and successes.

## ***Evaluation***

Since 2001, SSP and the Burlington School District have contracted with an outside evaluator, PEER Associates, to assess promising practices in professional development,

student outcomes, including stewardship behavior and engagement in learning (linked to achievement), and program staying power. SSP, along with several other programs, is part of a national partnership, Place-Based Education Evaluation Collaborative (PEEC). The PEEC evaluation results show that, in general, place-based education transforms school culture, connects schools and communities, invites students to become active citizens, and energizes teachers (Place-based Education Evaluation Collaborative, 2004).

## **Conclusion: Essential Elements for School Transformation**

The development of the Sustainability Academy at Barnes has been a transformative process that has changed the community and the school district. The evolution of the Academy illustrates how a school and a school district can be reoriented to address sustainability. The Academy is a replicable and scalable model that involved four key school transformation elements. Those elements are described in this final section.

### ***Vision and Leadership***

A consistent leadership team is critical to the success of any school transformation. Without shared vision, values, and effective communication, the school mission cannot be realized. Leadership has been one of the most significant challenges in the story of the Sustainability Academy. In 2005, the PEER Associates' evaluation of SSP at Lawrence Barnes cited frequent teaching staff and leadership turnover as a concern. Since SSP began working with Lawrence Barnes in 2004, there have been three SSP Coordinators and three principals. At the same time, all but two of the original teachers left and were replaced. There have been many positive contributions from all of these individuals, but the lack of continuity has prevented evolution of the school culture, impeded development of long-term goals, and hindered the school's progress toward realization of the original vision for the Sustainability Academy. Despite this challenge, the Sustainability Academy has still made significant progress in several key areas.

### ***Professional Development and Coaching***

In 2009, when the magnet schools were being launched, the Burlington School District created the new position of Sustainability Coach to support teachers and to collaborate with the SSP staff. This position was intended to be an advocate in both the school and community, coaching teachers on using the lens of sustainability, supporting families in their understanding of what this means for a K-5 school, and working with community partners who are leaders in sustainability.



The district uses a coaching model for other disciplines including literacy, science, and mathematics and has found that this model has been effective in building teachers' capacity in particular pedagogies and content areas.

Shelburne Farms' SSP provides a majority of the professional development, which is tailored to the school's unique location, population, and resources. The professional development supports teachers' acquisition of content with the lens of sustainability and instructional practices that engage students in their community. SSP staff work directly with the classroom teachers to model instructional practices.

SSP staff and the school's Sustainability Coach offer a series of study circles that use professional learning community models and protocols. The study circles are designed to be reflective and offer teachers the chance to have collegial conversations about their practice and student work. This is a true luxury for many teachers in public schools where there is little time for teachers to talk to each other or to reflect on their own practice.

### *Community-Wide Collaboration*

Schools are often isolated from the rest of the community. Students enter the building in the morning and return home each evening to their families and the community with little information shared about what happens there each day. The Sustainability Academy has offered programming that invites the community into the school. In addition, students learn in the community. They can frequently be found planting and tending the school's many gardens, interviewing shop owners near the school, presenting at community forums, or investigating a pond habitat.

The school had often held community dinners in the past, but has now reoriented those to fit them within the context of sustainability. As a result, a new focus on presenting student work related to the Sustainability Big Ideas in the curriculum, such as healthy and local foods and community partners, has emerged. For example, one such community dinner event featured first graders presenting their food chain artwork and reading their reports on animal and plant life cycles, farmers holding fresh vegetable taste tests, the county's solid waste department raffling a home composter, and students making and serving a locally grown feast. In conjunction with the community dinners, the SSP started family and community book groups using the Northwest Earth Institute's discussion courses. The book groups and the dinners have become a fixture in the school and community.

To further involve the partners and families, SSP established a "Stewardship Committee" charged with supporting the school in reaching its vision. The Committee is made up of teachers, staff, school leadership, district staff, families, and community partners. This group addresses issues faced by all schools such as academic achievement equity, in addition to ensuring that education for sustainability is being pursued. They advise the school leadership, make recommendations, and support the school in making changes.



Program evaluation results have consistently shown that one of the most critical and enduring elements of the Sustainability Academy model is the development of partnerships. Community partnerships provide support for student learning, campus improvement efforts, school transformation, and innovation. The collaboration happens both near and far stretching all the way to Asia. Through Shelburne Farms' partner network, the Sustainability Academy works with schools in the Dominican Republic, China, and Japan, as well as in nearby Vermont towns. Teachers and staff participate in learning journeys to innovative schools and programs to exchange ideas and practices related to education for sustainability.

### ***Sustainability Practices and Culture***

Campus and facilities management practices at the Sustainability Academy are evolving to incorporate sustainability. This includes healthy cafeteria offerings, school-wide composting, green cleaning products, schoolyard gardens, habitat restoration, and geothermal heating and solar electricity generation. The Burlington School District Food Service director is a leader in the national Farm-to-School movement and he and the school's cafeteria staff are champions of local, fresh, and seasonal foods. For example, daily, they offer breakfast, a fresh fruit or vegetable snack, lunch with a salad bar, and an after-school snack for all students. The teachers have been part of several statewide food education initiatives and have integrated food, farming, and nutrition themes into the curriculum and campus initiatives.

The pace of campus infrastructure changes may seem slow and can sometimes feel frustrating, but an essential part of education for sustainability is the application and transfer of new skills on the campus and in the community. For example, as students learn about life cycles of insects, they plant a pollinator garden; as they learn about how communities make changes, they are able to do so in their school.

All of the elements, outlined above, have a synergistic impact when they are applied collectively and thoughtfully to a school. The result is not a new initiative or program that must be added to an already overcrowded curriculum. Instead, sustainability can be a unifying lens that gives purpose and meaning to education. When the goal of education is to create healthy, sustainable communities, rather than to compete for limited resources in a global society, teaching and learning fundamentally change and teachers and students act and feel differently. Education for Sustainability has the promise of transforming schools and society toward a better future for all. In the words of the second graders at the Sustainability Academy: "Sustainability means if we all do a little it will help a lot."

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# Chapter 10

## Dearness Environmental Society and the Sudbury Schools

Eric Foster

### Background

In the fall of 2001, the Dearness Environmental Society began a collaboration with the Rainbow District School Board (<http://www.rainbowschools.ca/>) and the Sudbury Catholic District School Board (<http://www.scdsb.edu.on.ca/>), two boards of education in the City of Greater Sudbury, a community of 150,000 residents located in the northeastern part of the province of Ontario.

Why was Sudbury chosen for this collaboration? What was it that brought Dearness to the educational doors of this particular northern Ontario town? The answer, strangely enough, lies in its history (Ross, Grandmaison, & Johnson, 2001). Because extensive clear cutting and early mining and smelting practices radically eroded the soil of the Sudbury basin, by the 1960s, the area became famous for its black denuded hills which resembled a ravaged moonscape. The subsequent regreening and rehabilitation of the surrounding lands by the citizens of Sudbury brought national recognition to this northern community. Sudbury is now known for its environmental restoration efforts; even more significantly, it is known as a city that can bring about change. It was this energetic quality of the Sudbury community that attracted Dearness.

Although the initial efforts of the partnership between Dearness and the Rainbow District School Board and the Sudbury Catholic District School Board were humble, the results that have evolved are remarkable. Over the years, students, teachers, and administrators have learned and applied strategies that contribute to making schools sustainable. They now reduce their ecological footprint, protect their natural resources, interact with the community, take responsibility for the collective future, and design and build award-winning green schools. It is a tribute to all—students,

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E. Foster (✉)  
Dearness Environmental Society, Etobicoke, ON, Canada  
e-mail: ericfoster@rogers.com

faculty, staff, school officials, and parents who have nurtured and supported this transition over the years. Individually and collectively, they have transformed their learning community and become a model for others to follow.

Dearness has been recognized for its positive contribution to advancing the concept of sustainability and helping to create a “Sustainable Sudbury.” In 2010, the city awarded Dearness the Healthy Community Recognition award. In addition, in 2008 and 2011, the Sudbury Catholic District School Board presented the organization with sustainability leadership and service awards.

## *History*

The Dearness Environmental Society is a federally incorporated nongovernment organization, which has been in existence since 1994. The focus of Dearness is helping client school boards to develop, integrate, and implement locally specific sustainability practices in all school facilities, which have the added benefit of creating operating cost savings of tens of thousands of dollars (<http://www.dearness.ca>).

The story of Dearness and its work in the educational sector is one of evolution. Dearness first began its work in the mid-1990s as the educational arm of TESCOR, an energy service company. It was at that time that energy prices began to climb and boards of education launched technical retrofit programs in their schools to offset rising utility costs. These conservation upgrades were generally provided by energy service companies, like TESCOR, which guaranteed school boards sufficient reduction in utility costs to pay for the energy efficiency measures.

As more and more schools were equipped with technical wizardry, such as motion sensor-activated lighting and automatic flush urinals and toilets, teachers complained: “How come there is money available for conservation technologies, when books and resources are in short supply?” The value of these retrofits needed to be explained—the conservation payback, it appeared, was not intuitive. Dearness was one of the first NGOs in Ontario to respond to these concerns. They began delivering school educational programs which explained the local and global benefits of these technologies and soon thereafter added conservation behavioral measures. This approach included programming for all building occupants, which further enhanced school utility savings, not only for energy and water, but for waste reduction as well.

The resource conservation program that Dearness originally delivered to Ontario boards was a Province of Alberta creation called Destination Conservation (DC), an effective and successful national program. After a few years, Dearness acquired the rights to DC and expanded and enhanced the program. At this time, Dearness parted company with its technical retrofit partner, TESCOR, and began working independently. Dearness’ work eventually developed into two distinct, but collaborative, thrusts:

1. Resource (i.e., water, energy, and waste) reduction programming for teachers and students.
2. Training and energy management programs for school custodians and the school facilities departments.

Below is a list of services that Dearness delivered to both Sudbury school boards during the early years of collaboration. These are the program components which formed the foundation on which the later education for sustainable development (ESD)/conservation process programming was based.

## **Early Dearness Programming Provided to Sudbury Schools**

Dearness provided the following services to the two school boards in Sudbury in the early years of the partnership.

### **A. Workshops and presentations for academic staff and students:**

- An initial program overview workshop for principals, custodians, and teachers delivered in a central board location with 15–20 schools per workshop.
- Climate change and school resource conservation strategies presentations to the students and teachers of each participating school (elementary—Grades 4–8, high schools—all grades).
- Comprehensive in-service sessions in each participating school, with an identified “green” teacher and class, to provide the tools to involve the whole school in conservation activities.

### **B. Curriculum and lesson plans:**

- Beginning in 1996, Dearness developed resource conservation programs which were successful in bringing about attitudinal change around the issues of reducing energy, water, and waste in schools. Units of these materials were adapted to fulfill Ontario Ministry of Education guidelines and expectations (<http://www.edu.gov.on.ca/eng/document/curricul/curricul.html>) and were then infused into the following selected subjects of the Ontario curriculum: Grade 5 (Energy and Control), Grade 9 Geography (Canada and World Studies), and Grade 12 World Issues. These “hands-on” multidisciplinary units were developed to give teachers added “classroom-ready” resources in their work with students to reduce energy, water, and waste in schools.

### **C. Online programs and resources for teachers and students:**

1. Customized Web sites ([http://www.dearness.ca/sudbury\\_catholic/index.html](http://www.dearness.ca/sudbury_catholic/index.html) & <http://www.dearness.ca/rainbow/index.html>) for each Sudbury School Board with the following components:
  - A “rolling odometer” which shows the boards’ resource consumption in real time.
  - Detailed energy and water usage graphs for each school in each board.
  - Ontario curriculum and numerous resource conservation lesson plans (K–12).
  - Variety of additional related conservation curriculum resources.

2. Energy and water being consumed in students' homes including:

- How much energy and water use is costing per month.
- Which efficiency measures can be implemented to reduce consumption.
- Potential dollar savings after efficiency measures are implemented.
- The impact personal actions have on the environment.

D. Programs for operation and maintenance (O&M) staff:

The Sudbury O&M training program consists of a series of workshops to be delivered by an experienced facilitator. Based on adult learning principles, workshops are designed and focused on case studies for their specific schools. The training series covers heating, cooling, air handling, indoor air quality, lighting, and electrical and building control systems. Workshop case studies and tasking are designed to develop standards of performance for efficient building operation and maintenance.

E. Access to Dearness consultants for:

- Program customizing or modification to meet specific Sudbury Boards' needs.
- Ongoing board and school-level implementation support for all stakeholders for the duration of the program.

Most importantly, Dearness programs in Sudbury were designed to pay for themselves through energy, water, and waste savings. This was accomplished not only through facilities programs but also through school sustainability projects and educational programs infused into appropriate curriculum. Creating savings through curriculum involves engaging school staffs and administrators in identifying the school's major and minor disciplines. (Some of the disciplines such as geography and science naturally address the energy, water, and waste as a major component in the curriculum, while languages and arts have minor components in the existing curriculum.)

## **The Transition from Environmental/Conservation Education to Education for Sustainable Development**

Although scientists have long known that our pursuit of economic development has, to a large extent, been responsible for degradation of ecosystems globally, the environmental movement's efforts to prevent or reverse that degradation have not been widely successful. Generally, the movement has focused too much on ecological effects and too little on the political, social, and economic causes of that destruction. A broader, more strategic sustainability-based approach is needed to bring about changes.

Over the past several years, Dearness programming in Sudbury began to reflect these new directions and has moved from an environmental/conservation education base to delivering programs in the context of education for sustainable development (ESD). This modified approach, which uses the Dearness-developed programs as its foundation, underscores the concept that ESD is not an additional

“adjectival education” (e.g., environmental education, climate-change education, or sustainability education) but as a lens through which all of education is viewed. Given the overarching nature of ESD, Dearness programming is being expanded to include all aspects of the Sudbury boards’ operations. This change in perspective requires the following programming additions:

- Conducting strategic planning sessions with senior board leadership to develop a plan that infuses the concept of sustainability within all of the board’s operations. The plan addresses governance, teaching and learning, resources, and community. An emphasis on sustainability provides a broader framework within which to understand the interdependencies between energy, environment, and economics, as well as the impact these variables have on the board’s core business functions.
- Developing a recently mandated Ontario provincial government energy conservation and environmental plan that is set within a framework of asset and energy management addresses sustainability and reflects the need to balance economics and environment.<sup>1</sup>This plan sets specific objectives and targets for boards of education, along with the identification of appropriate implementation strategies to achieve these objectives.
- Conducting sustainability workshops for principals, teachers, and staff in order engage the whole school in pioneering the reorientation of a school culture to address sustainability to align with each of the boards’ sustainability priorities. The introductory workshop for school leadership teams is a full-day event consisting of the following sessions:
  - What is education for sustainable development?
  - What are the challenges for formal education and sustainability?
  - Introduction to the current reality of your organization/school.
  - Introduction to whole-school approach.
  - Small working groups to identify strengths and barriers of the organization/school and developing strategies for a whole-school approach.
  - Reporting findings of working groups.

The following are additional strategic programming steps that are under way with both boards, which are designed to further strengthen the shift from environmental/conservation education to ESD programming:

- Conducting a professional development day that introduces all board employees to ESD.
- Working with pilot schools to infuse sustainability into the curriculum.
- Working with teachers and staff from major and minor disciplines to develop a whole-school approach to sustainability.
- Assisting teachers in redesigning curriculum to move away from a “one subject–one class” approach to reorienting the material towards a whole-school culture of sustainability.

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<sup>1</sup>Green Energy and Green Economy Act, Bill 150 S.O. 2009, Chapter 12 Part II, section 6 (1–5) [http://www.e-laws.gov.on.ca/html/source/statutes/english/2009/elaws\\_src\\_s09012\\_e.htm](http://www.e-laws.gov.on.ca/html/source/statutes/english/2009/elaws_src_s09012_e.htm)

- Supporting school leadership teams in their work with students and staff to develop and implement the whole-school approach. A part of this process requires the creation of school-level sustainability plans to involve all school occupants.

The new approach moved from a program base to an ESD process base. Education is process based, and leadership must strive to incorporate ESD thinking into the process. The process approach can address the systemic issues of sustainability and provide the requisite skills that students will need to address real-world problems.

## **An ESD-Based Culture of Conservation Initiative**

### ***Background***

In the fall of 2008, Dearness Environmental Society was selected by the Ontario Power Authority (<http://www.powerauthority.on.ca>), a government agency responsible for electrical power in the province, to develop and implement ideas to create a Culture of Conservation (CoC) in the secondary schools of the province. This project was part of a comprehensive provincial government program aimed at ensuring that Ontario has a reliable and sustainable electricity supply for the present and into the future (Ontario Ministry of Energy, 2010).

Previous attempts to reach secondary schools were based on conservation materials for teachers/students or programs targeted at school buildings, but there were no program models that used a dual approach involving both curriculum and facilities. The Ontario Power Authority selected Dearness because of its experience in integrating both parts in its programming.

This initiative was unique in that it is the first time that a government agency has worked in partnership with an NGO to change the culture of an entire school system. The initiative was also very timely for Dearness, in that our organization was committed to and immersed in developing and delivering ESD to schools and school boards in the province. Secondary school students, in particular, have proven to be the most difficult student audience to reach and engage in promoting cultural change. The project focused on that specific challenge.

During the initial stages of developing the structure for the CoC project, Dearness held discussions with OPA regarding the best strategic approach for bringing about this cultural change. Dearness had learned over the years that schools and boards of education are not inherently interested in creating a conservation culture or even in delivering energy education. Yet boards are interested in energy savings. Furthermore, teachers are concerned about creating a more sustainable future for young people. It was therefore mutually agreed upon that the CoC initiative would be explored and developed within an umbrella framework of ESD. To gain experience with an integrated approach to school sector needs, Dearness negotiated a 3-year pilot project to allow sufficient time to ensure successful implementation. The scope of the pilot



project involved a review of school board needs related to energy conservation and the implementation of ideas and concepts to address those needs. The intent of the pilot project was to find new ways of engaging school board clients in a more comprehensive and effective manner and to mutually develop the framework for an ESD-based process that would bring about a CoC.

### ***Stakeholders and Partners***

The task of developing and embedding a CoC in Ontario's secondary schools was a daunting challenge. The questions that had to be addressed included the following: How do you bring about this cultural shift? What should the shift encompass? Whose responsibility is it to fund and manage the shift? Where is the leadership? To undertake this demanding project, the Dearness staff recognized that several steps must be taken, including:

- Understanding how the current culture of unfettered consumption had been formed and maintained.
- Identifying change agents related to the task.
- Partnering with organizations and individuals in formal education who were crucial stakeholders to the CoC project.

To accomplish these steps, Dearness staff focused on key elements: interested and experienced school systems, curriculum writers, curriculum implementers, faculties of education, professional teacher subject associations, and ministry documents.

### **School Systems**

While schools are usually neither the original shapers nor the maintainers of culture, they are often seen by society as the cure for many issues that plague society at large. The cure, however, is often seen as yet another kit to be given to teachers. As a result, teachers may feel overwhelmed by the extra demands made on them. For the CoC project to succeed, it needed to move beyond teachers and even individual schools to address school systems, and this meant engaging school boards.

Clearly, what was needed was the development of an approach that would be welcomed by the school systems across Ontario. Dearness staff returned to school boards, which knew Dearness' work and were interested in developing an ESD-based cultural change for the long-term benefit of their students, staff, and the wider community they served. These boards, predominantly in the Sudbury area, have been invaluable to the CoC project in a number of areas: online resource development, the use of video and information technology engagement, school construction techniques, real-time metering of utility usage, community engagement, and capturing student voices. Change is always difficult, and pilot

projects are needed to target the “early adopters” and make progress. The Sudbury boards had already demonstrated fundamental change and provided a foundation on which to build new ESD processes.

## Students

To understand how to create a culture of conservation, it was essential to understand some of the drivers of our current culture in Ontario. It stood to reason that students, who were the targets of this project, had some of the answers. Thus, over the past couple of years, Dearness staff have asked students what mattered to them as well as to share some of the pressures they felt in regard to their behaviors and choices. This investigation began with questions about climate change such as “What do you think about climate change?” “How does this information make you feel?” “When do you feel better about climate change?” “Does anyone make you feel better?” and “What do you think of the role that government has played?”

The students seemed eager to reply to these questions. Their eagerness gave the impression that no one had previously asked them about their thoughts and feelings on this topic. Dearness staff queried further, “Had anyone asked?” Many said, “No, no one asked.” The students were relieved to talk about how frightened and angry they were about climate change and how frustrated they felt as a result of the inaction of adults. They were watching and listening and felt helpless. They were inspired by a few people who were proactive and felt a great surge of empowerment by organizations like Free the Children (<http://www.freethechildren.com/>).

Dearness staff also interviewed students about other themes: their use and conservation of electricity, their use and conservation of water, bottled water, pressures they felt on their buying habits, and what made them happy. One recurring theme that emerged from the interviews was how much better they felt when they were involved in a campaign. They enjoyed creating campaigns in their schools focused on recycling paper or plastics, cleaning up a creek, planting trees or gardens, raising funds for wells and animals, or building schools abroad. Over the past couple of years, the Dearness staff observed that as the students learned how their personal choices affect the distribution of resources internationally, they are increasingly embracing social justice issues.

Students said that they recognized the benefits of “actions” because they can see the positive changes first hand, and these made them feel good. One student poignantly said that the newly constructed green school she was attending made her “feel good.” Referring to the energy-saving design of the school, she said, “It’s not that hard.” Then added, “I thought it would be hard, but it’s not that hard.”

From these conversations, Dearness staff concluded that the students’ voices and actions are essential for change in the culture to take place. Enduring change will require students to engage and take ownership. Dearness provides support with workshops, tools, and connections, as well as with the ability to listen, cheer, initiate, and push on. Dearness staff meet the secondary students where they are, reflect their concerns, and help to make their hopes and actions contagious.

## *Academic Activities*

There is no shortage of approaches, topics, or themes when teaching about sustainability, energy, and conservation. The challenge is to create an integrated learning experience across the curriculum, where all content is viewed through the ESD lens.

One way to start integrating selected content into the curriculum is to identify subjects that already contain a broad form of ESD/conservation concepts and then infusing ESD into the curriculum of that subject. The secondary subjects, which were identified as having the best matches, were Grade 9 Geography, Grade 9 and 10 Science, Grade 10 Civics, and Grade 12 Canadian and World Studies.<sup>2</sup> Dearness saw these subjects as a first-round pick only, because, in order to bring about culture change successfully, every subject needs to include ESD content.

To identify mandated Ontario curriculum content that could both be adapted for easy and logical infusion of ESD concepts and projects, Dearness worked collaboratively with several experienced teachers who had expertise in curriculum. It was imperative to engage teachers to illustrate that a cultural shift is central to and supportive of their own goals of academic excellence and student development. The lesson plans would, therefore, have to meet mandated curriculum expectations, be relevant and interesting to students, be classroom ready but certainly not be a curricular “add-on.”

## *Lessons Learned*

During the course of the pilot project, Dearness staff has continued to learn about the intricacies of creating and/or altering secondary school culture as it relates to ESD and conservation. The following is a categorized summary of these core learnings.

### **School Boards**

- School boards are not inherently interested in either culture of change or even energy education.
- While school boards are interested in energy savings, they do not want to upset teachers with more demands on their teaching time.
- School boards currently do not see their role or responsibility in reducing the energy consumption of their residential communities.
- Engagement of school boards is one of the most significant challenges. In spite of the obvious savings, curriculum improvement, student interest in current climate change, etc., school systems are reluctant to become involved. Many senior decision makers see participation as an additional add-on that will burden already overburdened teachers. Others feel that they already have a program and are

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<sup>2</sup><http://www.edu.gov.on.ca/eng/document/curricul/curricul.html> (To find specific curriculum, click on “secondary” then click on “by subject” or “by grade.”)

doing all that their plant operations staff can do. Many boards indicated that they already had a “lights off” program and recycled and did not need to discuss the issue further. Others showed some interest, but did not have the initial funds to proceed. In other words, it seems that a plateau has been reached in energy conservation programs and a significant effort will be needed to find a new strategy that will produce a new level of action.

## Schools

- There is a wide variety of activities that students and school staff could be undertaking from energy conservation to banning water bottle sales to planting trees, etc. However, there exist a wide range of responses and levels of engagement from school to school within any particular board. In some schools, there are many “random acts of conservation” that engage students, but these may not be organized under a single school-wide effort. In others, there may be a solitary after-school club that reaches 5–10 students at best.
- Schools are partners in the culture of change undertaking, but working with schools in isolation without senior administrators, board support services, and even parents is not the solution.
- Schools and school systems need help in moving their perspectives from seeing the development of a culture of conservation as an additional imposition to seeing it as an opportunity to solve existing current issues such as school achievement, student engagement, and staff/community relations. To achieve this perceptual transformation, concrete success stories from a few key innovative boards will be required.

## Teachers

- Most teachers do not see the big picture of education creating a more sustainable future for all.
- Once teachers have been exposed to this concept and understand it, they are receptive to including sustainability in their teaching.
- Engaging teachers also has its challenges and opportunities. Secondary schools have evolved into a system of disciplinary silos. Different silos do things differently, and little effort is put into making connections from one subject area to another. The Sustainability and Education Academy (SEdA, see Chap. 2) created a unique working group called SEdA-SA (Sustainability and Education Academy-Subject Associations), which, for the first time, brought subject associations and a faculty of education together to discuss a common curricular element. The major points of some of those discussions included:
  - Build on strengths identified (i.e., science and geography have strong connection to environment, social justice, and human interaction with the environment).
  - Literacy and numeracy (i.e., mathematics and English) have a skills focus, but do not have specified content. They are ripe for ESD. They just need to make the ESD connections.

- Secondary teachers have their specialties (e.g., English teachers focusing on the environment—one uses media; another, eighteenth-century romantic poets; and, still another, aboriginal teachings). They need help to view their specialties in a different way.
  - Intermediate students have strong interest in social justice issues, while senior secondary students can be reached through economic issues; elementary students connect more through the environment.
  - Secondary students tend to rally around projects. Work with the teachers to make connections between projects and curriculum, encouraging student project leaders to work on the connections, will help them gain more resources (e.g., a technology teacher joins forces with a physics teacher in designing and building windmills, installing photovoltaic panels). (See Chap. 21.)
- Teachers do not understand climate change, but are willing to learn.
  - Instructional resources must be linked to curriculum, easy to access, require little preparatory work, and be low or no cost.
  - Teachers must become knowledgeable about school practices in regard to energy, water, and waste to be able to take advantage of the teaching opportunities which the school buildings present.
  - To help teachers bring about long-term change, a support model that will assist them in incorporating new subject matter into their classrooms will have to be provided.

### **Custodial Staff**

- To ensure maximum resource conservation, it is essential to include the school custodial staff in the design of a school resource conservation package. Failing to provide a role for facilities alienates the custodians, with the result that the desired savings may not be achieved.
- Support for custodians is as much about learning as it is about training. The two elements need to be equally pursued.

### **Teaching, Learning, and Curriculum**

- Connections to local issues are essential to learning, but they must be perceived relevant to community needs.
- Culture of change is best learned through active participation and assimilation rather than being read to or told. School staffs (academic and support) and students, who become aware of an issue and accept it as theirs, tend to become involved in solving problems and engage others in their solutions. They are the change agents. Information alone is not enough. Students are keen to develop their own school culture.
- Recognizing, rewarding, and celebrating success is important.
- In order to involve students, connections need to be made within the context of their interests and their concerns. Key ideas that matter to them are “action,”

“change,” and “feeling good.” Access to electronic media, providing the technology to publish their thoughts, and involving them in planning school projects, all ensure students are engaged and participating in a form of education that will help them create a more sustainable future.

- Climate-change education (CCE) is about both the natural sciences of climate and the social sciences that deal with human change and adaptation. In this respect, there is a role for many secondary school core disciplines in CCE. By acknowledging the reality of the serious sustainability challenges students will encounter during their lifetime, teachers will slowly see climate change as a core topic of concern and not just another curricular add-on.
- ESD and conservation education must be made central to the business of a quality education. Energy savings, which is the current predominant mental model in school boards, needs to be replaced with a mental model that is more in line with quality education itself. To this end, new approaches must be researched that focus upon the knowledge, skills, and values that students will need to cope with the world they are inheriting. Part of the necessary skills and values include exploring a significant cultural shift away from a paradigm of personal consumption. This is not an easy undertaking, and it must be seen in a context of education and not indoctrination.

## Concluding Remarks

Environmentalism and sustainability are often used interchangeably, but have significantly different meanings. Environmentalism has historically been used as a catch phrase for promoting positive environmental actions and reducing those actions that have negative consequences. Sustainability, on the other hand, is a much broader paradigm. It is an umbrella within which many concepts, including environmentalism, exist. Sustainability provides the framework for creating a culture of change: “Well Being for All, Forever.” Sustainability frameworks recognize that systemic problems need systemic solutions.

Most schools and boards of education in Ontario have been, and continue to be, diligent in pursuing environmentalism. Students, teachers, and administrators see the importance of this global issue and are concerned and committed to making a “green” difference. But “green” is not the same as sustainability, which also includes social justice and economics.

Schools and school systems can be guided in making the transition from environmentalism to sustainability. It is important that schools and school systems see this change, not as an additional imposition, but as an opportunity and a vehicle to creating a better planet as well as solving existing current issues such as school achievement, student engagement, and staff /community relations.

Based on the Dearness experience over the past years, Dearness has identified the following principal content for an ESD-based Culture of Conservation program that can help boards to bring about this transition:

- Lesson plan materials and teacher workshop support.
- Web-based challenges/solutions for student learning.
- Home audit for students Grades 5–12.
- Training for school facility personnel.
- Interval electricity data for schools.

Working with schools and boards of education over the course of many years has given Dearness meaningful experience in developing an integrated approach to school sector needs related to ESD. The school boards in Sudbury were instrumental partners with Dearness developing a framework for an ESD-based program that can help other school boards to make that critical shift from environmentalism to sustainability.

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**Part IV**  
**Reorienting Curriculum**  
**to Address Sustainability**



# Chapter 11

## Ecological Economics Education

Susan Santone

### What Is Economics?

Economics, famously dubbed the dismal science, is broadly concerned with a question that is anything but dull: How does society allocate scarce resources to meet seemingly unlimited wants and needs? Answering this question involves every facet of the economy, including production, distribution, supply chains, markets, consumers, finance, global trade, policy, and governance. But these concepts raise only more questions. How do cultural beliefs shape our notions of needs and wants? Where do all the “things” we need or want actually come from? How do we evaluate the governance, the structures, that determine economic policy? Layer in issues, such as climate change or food security, and economics moves from “dismal” to dynamic and influential.

For sustainability-minded educators, economics is something more. It is one of the “three Es” that is inextricably connected with the other two, the environment and equity. Understanding economics is thus indispensable for K-12 teachers looking to support students in crafting holistic solutions to the challenge of unsustainability.

With countless schools of economic thought, teachers must be able to differentiate approaches that advance sustainability from those that do not. Moreover, teachers must be able to build this understanding in students across grade levels and disciplines. This chapter is intended to support teachers in this daunting task. This chapter introduces the fields of ecological economics and “conventional” economics by comparing their fundamental assumptions and principles using philosophic, historic, and scientific lenses. The final part of this chapter introduces strategies for teaching ecological economics in K-12 classrooms, comparing these approaches to “conventional” approaches.

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S. Santone (✉)  
Creative Change Educational Solutions, Ypsilanti, MI, USA  
e-mail: santone@creativechange.net

## *Framing the Spectrum of Economic Paradigms*

In his influential 1962 work, *The Structure of Scientific Revolutions*, Thomas Kuhn describes a “paradigm” as an accepted set of models, patterns, beliefs, and assumptions about how the world operates. An economic paradigm is thus a set of beliefs about how the economy operates. This includes beliefs and assumptions about the interactions among businesses, individuals, policies, resources, communities, and other actors in the system. An economic paradigm is also defined by more basic assumptions about human nature and motivations. Is greed a natural impulse? Is personal reward the only—or most important—factor in economic decisions? The varying answers to such questions reflect the broad spectrum of economic theories.

This chapter describes and perhaps simplifies the spectrum of economic paradigms by defining broadly the two (not necessarily extreme) ends: “conventional” and “ecological.” Conventional economics refers to the practices and assumptions associated with the dominant global economic system of market-based capitalism (Keen, 2001). This paradigm’s distinguishing features include private ownership of wealth and capital, competition in markets to determine production and the allocation of resources, and limited government intervention. While there are many active debates surrounding these issues, they all operate within the conventional paradigm’s most fundamental premise that unlimited growth is both desirable and possible. The role of this assumption in shaping the conventional paradigm is explained further later in this chapter.

The other paradigm, “ecological” economics, likewise concerns itself with fundamental questions about resources, allocations, and associated policies. However, unlike its conventional cousin, ecological economics begins with a fundamentally different premise, namely, that all economic activity operates within larger ecological systems. This bedrock principle leads to this paradigm’s fundamental question: *How can we create an economic system that enables individuals and communities to thrive, while also sustaining the capacity of the environment to support this?* (Daly & Farley, 2007).

Thus, the two paradigms can be compared and contrasted based on two dimensions:

- The relationship between the environment and the economy
- The fundamental goal of the economy and measurements of success

## *Definitions*

Before going further, readers may benefit from a clarification of the term “environment.” As commonly defined, the environment is all living (biotic) and non-living (abiotic) substances on earth that comprise our surroundings (Miller & Miller, 2002). Biotic substances include plants and animals and are considered “renewable” because they can reproduce. Abiotic materials include minerals, rocks, and water. Because these materials cannot grow back or reproduce, they

are considered nonrenewable. However, all abiotic and biotic materials are recycled within the earth's system through the nutrient cycles (carbon cycle, water cycle, nitrogen cycle, etc.).

These basic principles tell us that humans are a part of the environment and that the environment is everywhere, not just in the rainforest, the arctic, or other "wild" places (that are often without people). Conceptualizing the environment as a place far away and without people is not only scientifically inaccurate, it also reinforces an anthropocentric worldview: the belief that people are separate from and "above" the environment and that it exists primarily for human needs (Bowers, 1999; Kahn, 1997).<sup>1</sup> In contrast, a biocentric view reflects the idea that humans share the environment with other species and that the natural world has value beyond how it serves humans (Kortenkamp & Moore, 2001).

By some interpretations, the familiar phrase "natural resources" reinforces the belief that the environment is merely a source of materials for human use (Kennedy & Thomas, n.d.). Therefore, this chapter offers the phrase "natural materials" to more accurately reflect the idea that the environment supports all life forms, not just humans.

## A Comparative Analysis of the Paradigms

The most significant difference between the conventional and ecological paradigms is their respective assumptions about the relationship between the economy and the environment. While the conventional paradigm tends to represent the economy as separate from the environment, the ecological paradigm begins with a fundamentally different assumption: that economic activity occurs within, and depends upon, larger ecological systems. In other words, *the economy is contained within the environment*. This is more than an assumption; it is a basic scientific fact. The following section reviews the basis of this paradigm as drawn from physics and ecology and then evaluates the conventional paradigm in light of these concepts.

### *The Ecological Paradigm*

The first principle underlying the ecological paradigm is that everything needed to support life (human and otherwise) comes from the living or nonliving substances of the environment. For humans, this includes the materials for food, shelter,

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<sup>1</sup> Anthropocentric thinking is not necessarily antienvironmental. Anthropocentrism is also reflected in, for example, a desire to "protect" the environment when it is motivated solely by human needs. Note that anthropocentric thinking is not innate in humans; rather, it is culturally determined and tends to increase with age in children living in Western cultural contexts (Kahn, 1997).

transportation, entertainment, and other needs. For example, trees are the basis of paper, lumber, and cardboard. Petroleum (crude oil) is used to make plastics and fabrics (nylon, polyester). Sand is a source of silica, which is the basis of glass and other products.

A second, related principle is that the environment provides critical life-sustaining services for all species. The sun provides food energy. Wetlands purify water. Forests provide habitat and beauty. These “ecosystem services” play a fundamental yet often undervalued role in the economy. For example, the wetlands and waterways that surround agricultural fields absorb fertilizer runoff. Trees absorb carbon emissions from fossil fuel use while also providing oxygen. Microorganisms decompose plant and animal matter, adding to soil fertility. Whereas the conventional paradigm tends to ignore the value of these vital functions, the ecological paradigm attempts to assign a clear value. A landmark study (Costanza et al., 1997) assessed ecosystem services to be worth \$33 trillion per year. This was almost double the global output of human-made goods and services, valued then at \$18 trillion. While such research invites speculation and debate, it nonetheless moves the value of the environment (intrinsic and otherwise) into economic discussions. Attempting to place a monetary value on ecosystem services can be seen as playing into anthropocentric worldviews that conceptualize the environment in purely market terms. However, ecological economists point to valuation as a method to convey the incalculable value of the environment to people who have yet to see beyond monetary terms. Thus, economic valuation can serve as a tool in communicating, albeit in problematic terms, the importance of the environment, the true value of which is far beyond human limitations of the concept.

A third principle of the ecological paradigm is that natural materials are transformed through the multiple stages of a product’s life cycle, including extraction, manufacturing, distribution, consumption, and disposal. For example, manufacturing strawberry jam requires growing berries (with machinery powered by diesel fuel), cooking them (using coal-powered electricity), and transporting the jam. Use and disposal may involve refrigeration or energy for recycling the jar. Moreover, the energy involved in each stage requires its own set of transformations, such as mining, refining, and combustion. All of these stages create outputs in the form of wastes. These outputs go back into the environment in one form or another. The glass jar may end up in a landfill. The carbon emissions from processing the jam will go into the atmosphere. As described in the next two principles, these wastes do not and physically cannot disappear.

The laws of thermodynamics are physics principles as fundamental and immutable as gravity. The first law, the conservation of energy, states that energy is never created or destroyed but rather is transformed from one form to another. For example, consider the process in which energy is transformed to power a vehicle. The potential chemical energy in gasoline transforms into kinetic mechanical energy (movement) through the process of combustion. However, the gasoline is not “gone”; the energy has been converted to movement, with heat loss and outputs such as carbon dioxide.

Can we “recapture” these outputs to move the vehicle again? The second law, entropy, tells us no. Entropy is a measure of how *available* an energy source is to

perform useful “work” (such as moving the vehicle). With each step of transformation (such as combustion), energy becomes less able to do work; heat and other outputs become more diffused. For example, after gasoline is burned, the emissions are not able to fuel the vehicle because the energy has dispersed. Gasoline is thus low entropy (high availability to work), while the outputs of combustion are high entropy (low availability).

### ***The Conventional Paradigm***

The scientific foundations of ecological economics are largely absent from the conventional paradigm. Nothing more clearly demonstrates this than a look at its basic model. Macroeconomics is the “big picture” view of the overall economy, as opposed to the microeconomics’ focus on individual firms. Conventional macroeconomics is represented in virtually every economics textbook by the classic “circular flow model.” This diagram shows the flows of money among households, businesses, and government. Understanding these relationships is certainly important. But where in this model is the environment? It is seemingly nonexistent except for a nod to “land” as a factor of production (along with labor and capital). Unlike the ecological paradigm in which the environment is the containing system, the conventional paradigm regards the environment as a mere input, with all its complexity stripped away by the simplistic label “land.” The conventional model largely separates the economy from the environment.

From a sustainability perspective, the conventional model is problematic on scientific and cultural levels. First, it ignores the fundamental biophysical reality that the environment is not just a “factor” of production but is the *basis* of it. This misrepresentation stems from a cultural issue. The belief that people and their activities (i.e., the economy) are separate from the environment reflects the anthropocentric notion that the environment is merely a source of materials for human use.

### **The Economic Goal: A World of More, Better, or Both?**

With the basic assumptions of each paradigm laid out, we next turn to the ways each approach answers another fundamental question: What is the economy for? We begin with the ecological paradigm.

### ***Ecological Economics: Toward a Better Household***

Etymology is a good vantage point for understanding the ecological paradigm. The word “economics” comes from the Greek “oikonomia,” which means “household management.” Inasmuch as ecological economics is rooted in the concept of

interdependence, this paradigm's definition of "household" thus includes the natural and human systems that sustain life. These shared and inherited gifts, such as water, air, language, and culture, are known as the *commons* (Friends of the Commons, 2008).

In the ecological paradigm, the well-being of individuals and communities (including the environment) is connected and dependent upon a healthy commons. In this view, the goal of the economy is to distribute goods and services in ways that sustain the long-term well-being of the household and all it implies (Daly & Cobb, 1989). A "successful" economy is defined by *qualitative* improvements in the well-being of the entire household. For humans, this means better health, stronger families and communities, and more security and happiness. Also, because these outcomes occur within larger ecological systems, "success" includes—and ultimately depends—on a healthy environment. In short, the purpose of the economy in an ecological paradigm is to make things *better*: supporting improvement in the overall quality of life in ways that sustain the systems that contribute to it.

### ***Conventional Economics: A Focus on Growth***

In contrast to the ecological economics goal of preserving a healthy commons, the conventional paradigm focuses on these core questions (National Council for the Social Studies [NCSS], 2010):

- What is to be produced?
- How is production to be organized?
- How are goods and services to be distributed and to whom?
- What is the most effective allocation of the factors of production?

The focus on production and distribution evident in these questions hints at larger assumptions underlying the conventional paradigm, i.e., unlimited growth is the overriding economic goal.

The centrality of the idea of economic growth in the conventional paradigm can be traced back to 1712, when Thomas Newcomen invented the coal-powered steam engine (McKibben, 2007). Up until that point, the scale of economic activity was limited by the availability of energy through the "muscle power" of people and animals or the mechanical energy delivered through, for example, windmills or water wheels. The introduction of fossil fuels and engines enabled people to dramatically expand access to energy and with it production. The next three centuries brought about dramatic and unprecedented expansion in the production of food, clothing, housing, transportation, and other needs, accompanied by rapid global population growth.

However, growth was more than a phenomenon; it was a belief system. Growth drove the expansion of colonial economies in the eighteenth century and the US ideology of "Manifest Destiny" in the nineteenth century. In the twentieth century, growth became associated with "development" and the process of industrialization.

For example, in his 1949 inaugural address, President Harry Truman proclaimed that “we must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas” (Truman, 1949). In this speech, Truman coupled growth, at least in theory, with a humanitarian aim: “The old imperialism—exploitation for foreign profit—has no place in our plans. What we envisage is a program of development based on the concepts of democratic fair dealing.”

Growth was further embraced by leaders across the political spectrum, from John F. Kennedy to Ronald Reagan to Nikita Khrushchev, who proclaimed that “Growth of industrial and agricultural production is the battering ram with which we shall smash the capitalistic system” (McKibben, 2007, p. 8). In this way, the conventional paradigm’s emphasis on “more” became the means to a “better” life. In many ways, it was.

Of course, history also is quite clear on the downside of this growth, including the degradation of people and the environment subjugated to serve it. Slavery, child labor, and deforestation were all methods to drive growth, contributing to the social inequalities and environmental problems still with us today (World Commission on Environment and Development, 1987).

So why did these realities not temper the fervor for growth and force society to redefine it? The answer lies in how the conventional paradigm measures success.

### ***The GDP: Measuring Success in the Conventional Paradigm***

The conventional paradigm’s most prominent measurement tool is the gross domestic product (GDP). The GDP is “the total market value of the output of goods and services produced by labor and property located in [a given country]” (Bureau of Economic Analysis [BEA], 2007). The GDP includes consumer and government spending, investment, and the value of exports, minus the value of imports. Historically, the GDP has grown at an average of 2.5–3% per year but with substantial fluctuations during recessions and boom periods (BEA).

Because the GDP is indexed to the market value of goods and services, it grows each time money is spent. This is a problem from the ecological perspective because market value is only one dimension of the overall worth of something. For example, clear cutting a forest registers as “growth” in the GDP based on the value of the timber, but the value of lost ecosystem services (habitat, erosion control, carbon sequestration, etc.) is ignored. Likewise, the GDP views divorce as “positive” given the legal fees and other dollars spent on counseling or establishing a new household. The potential social or health costs associated with divorce are ignored. Thanks to this selective accounting, policymakers cheer growth while simultaneously ignoring the erosion of the environmental and social capital on which the economy ultimately depends.

The fundamental assumption behind the GDP is that unlimited growth is both *desirable* and *possible*. In terms of desirability, growth is seen as the main way to

increase benefits, called “utility” by economists. At some level, this holds true. People have needs, and, after providing for basics such as food, shelter, and clothing, additional production and spending (growth) may focus on entertainment, travel, or additional comforts. For people without basic needs such as food, getting “more” material goods may well mean a “better” life.

The second part of the belief that unlimited growth is possible derives from a worldview that neither sees nor understands environmental limitations. This worldview stems from the conventional assumption already discussed: that the environment is separate from the economy. A growing number of business leaders and economists are recognizing this is not the case. As Herman Daly, former World Bank economist and revered “grandfather” of ecological economics notes, “the evolution of the human economy has passed from an era in which manmade capital was the limiting factor in economic development to an era in which remaining natural capital has become the limiting factor” (Goodland, Daly, & Serafy, 1992, p. 23). In other words, whereas economic activity was once limited by the availability of energy or industrial infrastructure, today, declining ecological conditions will be (and in some ways already are) a decisive factor driving the future of the economy.

At the same time, growth is not necessarily an anathema to the ecological paradigm. As designers William McDonough and Michael Braungart (2002) point out, a lot depends on what is growing. Is there growth in local food economies and with it, growth in social capital and health? Or is there growth in “junk food” sales with external (and often unaccounted for) health costs?

Nonetheless, many ecological economists advocate a “steady state” approach that scales economic activity to the ability of the environment to provide the materials and absorb the associated wastes (Daly, 1980). Ecological economists base their argument on clear evidence about the current state of “overshoot” and unsustainability that characterizes human impact on the environment (Wackernagel et al., 2002).

Growth becomes “uneconomic” when the environmental and social costs of growth outweigh the marginal benefits (Daly & Farley, 2007). Finding this balancing point is a compelling economic challenge.

### *Alternatives to the GDP: Tools for the Ecological Paradigm*

While GDP effectively measures growth, it fails to account for other measures of well-being: the overall quality of family, community, health, ecosystems, and other members of the “household.” Therefore, economists have developed alternative indicators based on the understanding that environment, economics, and social well-being are inextricably related.

The two most prominent indicators that reflect an ecological economic perspective are the Index of Sustainable Economic Welfare (ISEW) (Daly & Cobb, 1989) and the Genuine Progress Indicator (GPI) (Talberth, Cobb, & Slattery,



2007). While these methodologies differ somewhat from each other, they share the basic approach. Like GDP, the ISEW and GPI include expenditures. However, unlike GDP, the ISEW and GPI add in the value of non-monetized benefits and subtract the costs of negative environmental and social impacts. Additions include benefits to society that come from nonmarket activities such as volunteer time, housework, parenting, and services from roads or other public infrastructure. Subtractions include the impacts of negative activities like pollution, the costs of accidents, and costs associated with environmental degradation and depletion. To varying degrees, these indicators also consider the social costs of inequality (Talberth et al.).

Calls for an alternative to the GDP have moved into conventional economic discussions. For example, in November 2007, the European Commission, European Parliament, Club of Rome, the Organization for Economic Co-operation and Development, and the World Wildlife Fund hosted “Beyond GDP,” a conference focused on “clarifying which indices are most appropriate to measure progress, and how these can best be integrated into the decision-making process and taken up by public debate” (Beyond GDP, 2011). One outcome of that conference is that the European Commission released “GDP and beyond: Measuring progress in a changing world,” a 2009 document which outlines a roadmap to improve indicators of progress.

## **Economics Education Standards in K-12 in Canada and the USA**

Curriculum standards can serve as a basis for state or provincial guidelines and thus can drive economics instruction at the local school level. In Canada, curriculum standards are set at the provincial level, and economics-related topics can be found in some provincial social studies curriculum frameworks (e.g., Alberta and Ontario). However, there is not a set of nationally recognized economics education standards in Canada.

In the USA, two national organizations have developed economics education standards, the National Council for the Social Studies (NCSS) and the Council on Economic Education (CEE). The National Council for the Social Studies (NCSS) is a national association that serves as the umbrella organization for elementary, secondary, and college teachers of courses associated with the social studies (i.e., history, civics, geography, economics, political science, sociology, psychology, anthropology, and law-related education). The NCSS standards, *National Curriculum Standards for Social Studies* (2010), are organized into ten themes ranging from culture to governance to global perspectives. Economics is captured in theme seven, “Production, Distribution, and Consumption.”

CEE, a private nonprofit organization, provides the second set of economics standards. The CEE’s mission is “to instill in young people the fourth “R”—a real-world understanding of economics and personal finance” (Council on Economic

Education [CEE], 2012). Because the CEE standards focus solely on economics, they provide a more detailed set of outcomes than the NCSS standards.<sup>2</sup>

## **Strategies for Teaching Ecological Economics**

The various Canadian provincial as well as the NCSS and CEE economics standards largely reflect the conventional economic paradigm (Maier & Nelson, 2007) and thus create a challenge for educators seeking to form an ecological perspective. However, educators can employ the standards by leveraging the similarities and differences between the two economic paradigms, thus engaging students in a comparative analysis of the two perspectives.

This section provides a broad framework for teaching with this strategy, using the NCSS and CEE standards as a point of departure. The section is organized into two subsections to parallel the main topics in the chapter: the relationship between the environment and the economy, and economic goals and measurements. Each subsection outlines fundamental learning outcomes and teaching strategies and highlights connections to (or differences from) the economics standards. Extended narratives of teaching activities on life cycles, the ecological footprint, culture, globalization, and economics for young children can be found in Santone (2001, 2009, 2010).

### ***Teaching the Relationship Between the Economy and the Environment***

This section begins by outlining fundamental learning outcomes related to the economy and the environment. Outcomes are organized as core concepts, guiding questions, and enduring understandings (big ideas). These teaching suggestions are designed to support these outcomes.

#### *Core Concepts*

- Needs, wants, the commons, interdependence.

#### *Guiding Questions*

- What do we need for a fulfilling life?
- What supports our well-being?

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<sup>2</sup>Readers interested in a more exhaustive analysis of the standards might consult Maier and Nelson (2007).

*Big Ideas: Students Should Understand that*

- All people share certain needs for a fulfilling life; wants vary.
- The commons are natural and human-made gifts that sustain life and make well-being possible.
- The living and nonliving elements in the environment are the ultimate source of all materials we use to meet our needs.<sup>3</sup>

*Teaching Suggestions*

- To teach needs and wants, students can respond to the question, “What do we need to be happy and healthy?” or “What do we need for a fulfilling life?” After brainstorming responses, students can sort and prioritize needs vs. wants. Students can then examine what shapes their beliefs about needs and wants, exploring the influence of family, peers, media, or religion. Discussion can then focus on how these beliefs might vary across time, place, or culture.
- To teach interdependence, students can identify or map the elements and relationships that sustain their well-being, including families, communities, and the natural world. This activity not only supports thinking in systems, it also introduces the concepts of price and value, i.e., that while not all needs have a price (love, friendship), they have great value. This understanding is essential for students to see themselves as social beings—friends, neighbors, and family members—and not just “consumers.”
- To teach the commons, take a community tour to identify examples of shared natural and human-made elements and how they contribute to well-being (e.g., trees produce oxygen and habitat; roads and infrastructure enable transportation and commerce). (More advanced learners could examine the governance and economic structures that affect access to these resources.)
- To teach local economies, create a community food systems map to identify the interdependence of human and natural elements that provide food: farms, rivers, stores, processing facilities, etc.

More advanced lessons could focus on comparing beliefs about human-environment relationships as represented in different faith traditions, literary genres, art movements, and other forms of cultural expression. As students gain an understanding that the economy is embedded in the environment, they can critically examine the assumptions in the phrase “natural resources” and compare it with “natural materials.”

**Links to Standards**

These fundamental concepts about needs and wants link to NCSS standards and support NCSS Theme 7, “Production, Distribution, and Consumption,” which

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<sup>3</sup> The other part of this idea—that the environment also serves as the final “sink” into which all wastes go—is more advanced and would come after students understand that all materials come from the environment.

notes “People have wants that often exceed the limited resources available to them. The unequal distribution of resources necessitates systems of exchange, including trade, to improve the well-being of the economy, while the role of government in economic policy-making varies over time and from place to place” (NCSS, 2010). These basic concepts are also reflected in CEE Standard 1, Scarcity: “Productive resources are limited. Therefore, people cannot have all the goods and services they want; as a result, they must choose some things and give up others” (CEE, 2010).

Teaching needs and wants is a cornerstone for teaching economics from any perspective. However, both sets of standards gloss over the idea of “needs” in favor of “wants,” implying that needs are already met (Maier & Nelson, 2007) or that wants are insatiable (Daly & Cobb, 1989). Moreover, while the concept of well-being is mentioned in the NCSS standard, it is the economy that is the cause for concern, not the ecological and social systems that support it. The wording of the standard thus reflects a disconnect between the economy and the environment—a core assumption of the conventional paradigm.

Teaching these standards from an ecological perspective enables a more nuanced analysis of the relationship between the economy and natural systems. For example, introducing the concepts of the commons and ecosystem services offers a deeper perspective on the “Related Concepts” for CEE Standard 1, including Producers [*sic*], Production, Productive Resources, Services, and Factors of Production. Whereas the conventional paradigm would define “producers” as firms, the ecological paradigm would broaden this to include, for example, the plants and sunlight that produce food and other dimensions of the commons that contribute to well-being. When this distinction is identified, students can then differentiate between monetized (paid) and non-monetized goods and services. For example, firms produce goods and services for a fee yet rely on free ecosystem services such as the regeneration of natural materials.

This type of analysis helps students uncover the broader connections between human and natural systems—the core biophysical reality highlighted by the ecological paradigm. Students can apply this understanding to critically assess if and how it is reflected in the conventional paradigm and the presentation of key CEE concepts such as markets, price, and the role of money.

### ***Teaching Economic Goals and Measurements of Success***

A second entry point for teaching ecological economics is by focusing on the fundamental goals of the economy and critically assessing how it measures “success.” Here, the learning outcomes highlight differences between the ecological and conventional paradigms.

#### *Concepts*

- More, better, quality, quantity, growth, development, indicators, GDP, GPI.

### *Guiding Questions*

- What is the difference between quantity and quality?
- How are these outcomes measured? Give examples relevant to education, the economy, community change, etc.
- What is the relationship between quantity and quality in these examples? Is one dependent on the other?

### *Big Ideas: Students Should Understand that*

- Growth is quantitative; development is qualitative.
- Infinite growth is not only biophysically impossible but does not always contribute to well-being.

### *Teaching Suggestions*

- To teach “more vs. better,” provides students with a Venn diagram to compare and contrast things in their life that they want more of and aspects of their life that they want to improve. Are there any overlaps? When is more (friends, clothes, popularity) better? When is improvement in these areas related to other factors?
- To introduce the concept of indicators, use examples from everyday life such as grades or sports rankings. Students can then develop indicators in categories such as the economy, public health, or education. Students can use primary sources (census, etc.) to create a community “report card,” providing an opportunity to develop, research, analyze, and display meaningful data.

## **Links to Standards**

An examination of economic goals and measurements is a perfect way to meet CEE Standard 15, Growth: “Investment in factories, machinery, new technology, and in the health, education, and training of people can raise future standards of living” (CEE, 2010). Here, “can” is the operative word, inviting fundamental economic questions: When does growth raise standards of living—and what is included in that? Does “standard of living” mean only material goods or does it also include health, security, and other dimensions of well-being? At what point do the costs of growth outweigh the benefits? This line of inquiry supports essential critical thinking skills.

More advanced students can also apply this analysis to identify if and when growth becomes “uneconomic” (i.e., when the costs outweigh the benefits) (Daly & Farley, 2007). This provides an excellent context for meeting CEE Standard 16, Role of Government: “There is an economic role for government in a market economy whenever the benefits of a government policy outweigh its costs” (CEE, 2010). While the standard specifically applies the cost-benefit analysis to government, students can apply the same reasoning to evaluating the impacts of growth. This lens can provide a more thorough understanding of the roles and influences of multiple economic factors, including consumers, firms, and governments.

## Conclusion

Economics is an essential but complex element of sustainability that requires teachers to be able to critically evaluate economic beliefs, approaches, and policies. Ecological economics is a paradigm that supports the broader beliefs about sustainability, including interdependence and the well-being of human and natural systems.

Ecological economics offers a lens for students to explore such vital and timely issues as consumption, population, and development. Ecological economics provides an opportunity for students to grapple with issues through a transdisciplinary perspective just as they will need to do as citizens and workers (Daly & Farley, 2007). Because it is grounded in broader scientific principles that highlight the environmental and social impacts of economic activity, ecological economics supports the analysis and problem-solving skills needed to solve interconnected global problems.

What could be less dismal than that?

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# Chapter 12

## Social Studies and Sustainability: A Global Competency Framework

Margaret S. Crocco, Anand R. Marri, and Thomas Chandler

### Introduction

Using the framework of four critical global education competencies, this chapter considers the possibilities in curriculum and pedagogy for social studies education in the USA to engage the concept of sustainability. Although it is acknowledged at the outset that social studies has just begun to engage with this topic, suggestions are offered for further development of sustainability within the disciplinary and interdisciplinary contexts of teaching this school subject in K-12 classrooms.

In the USA, the field of social studies is just beginning to pay attention to sustainability as a curricular framework and research interest for K-12 schools and teacher education. Nonetheless, the disciplines that comprise the social studies (i.e., history, geography, political science, and economics) have taken up sustainability-related issues for decades. Even more important, perhaps, social studies is a school subject focused on civic decision-making. Thus, its affinities with sustainability are abundant. Sustainability is an arena of inquiry, discourse, and action aimed at considering issues at the intersection of the economy, society, and ecology.

For purposes of this chapter, we adopt the definition of sustainability given by the World Commission on the Environment and Development in 1987, sometimes referred to as the Brundtland report: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” More recently, Nolet (2009) raises a set of concerns with the implications of this

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M.S. Crocco, Ph.D. (✉)  
University of Iowa, Iowa, IA, USA  
e-mail: margaret-crocco@uiowa.edu

A.R. Marri, Ph.D. • T. Chandler, Ph.D.  
Teachers College, Columbia University, New York, NY, USA  
e-mail: marri@tc.edu; tec11@columbia.edu



definition over the last 20 years in his analysis of education for sustainability in teacher education.

As in social studies, education for sustainability is shaped by competing values and informed by knowledge from a variety of disciplines that come together to consider the present and future state of human society, nature, and the planet. The National Research Council also questions: “How and where will nine billion people live?” “How will we feed everyone sustainably in the coming decade and beyond?” “How can we best preserve biological diversity and protect endangered ecosystems?” “How are climate and other environmental changes affecting the vulnerabilities of coupled human-environment systems?” (National Research Council, 2010). Both social studies and sustainability involve deliberation about such questions that is based in knowledge, skills, and values. Many educators believe that in sustainability education and social studies education, action should follow deliberation.

From a values orientation, teachers of social studies have been concerned for decades with human rights, equity, and social justice—all core commitments of the sustainability movement. The issues-oriented pedagogical approaches (Evans & Saxe, 1996) that have been prominent within social studies are ideally suited to addressing questions such as those above. Social studies theorists (i.e., Gaudelli 2003; Hanvey 1975; Merryfield 1991) provide notable examples of an interdisciplinary, issues-oriented and inquiry-based curriculum aligning well with many perspectives within the sustainability movement. If we look at the constituent disciplines of social studies, we find a foundation for aspects of sustainability, although not necessarily the integration of perspectives that is so critical to education for sustainability. For example, “environmental history,” characterized as a “developing field” (Stewart, 1998) over 10 years ago, has seen the roster of historians working in this area grow considerably (see, e.g., Cronon, 1996; Limerick, 2001; Nash, 2001; Steinberg, 2008 for US history; and Bender, 2006; Diamond, 2011 for world history). In geography, sustainability issues are central features of the discipline (see, e.g., the National Research Council (2010) publication, *Understanding the Changing Planet: Strategic Directions for the Geographical Sciences* and Lee & Williams, 2006). In civics and economics, the potential exists for applying disciplinary tools and pedagogical approaches to the economic, ecological, and social questions associated with sustainability. In each of these cases, the integration of perspectives drawn from these fields will be crucial to a social studies approach to sustainability.

We believe that the conditions are ripe for acting on this opportunity. Recently, calls for developing citizens adept at critical thinking, group problem solving, and global cooperation have become more prominent (Owen & Videras, 2006; Risinger, 2006). Since its founding as a formal school subject in 1921, the mission of the social studies has been citizenship education (Barr, Barth, & Shermis, 1977; Woyshner, Watras, & Crocco, 2004). As such, social studies is uniquely well situated to provide an educational platform for developing a multifaceted and well-integrated approach to teaching about sustainability, deliberating public issues related to sustainability, and making informed decisions as adjudicated through the “tournament of values” lying at the heart of the sustainability enterprise (Robertson

& Hull, 2001). Public misconceptions about many topics related to sustainability make this an urgent matter for the field as it considers its own development over the next few years (see, e.g., the misconceptions within the public energy use, in Attari, DeKay, Davidson, & DeBruin, 2010).

For many years within social studies education and, indeed, within public education and civic discourse more generally, citizenship has been defined in nationalistic terms. The recent calls for global citizenship and global citizenship education (see, e.g., Gaudelli & Heilman, 2009; Mitchell & Parker, 2008; Myers, 2010; Parker, 2007) have added another dimension to the mix of educational outcomes public schooling should attempt to deliver.

Numerous parallels exist between the reform efforts aimed at global education and education for sustainability. Both movements promote developing modes of analytical and critical problem-solving skills to deal with issues beyond school; fostering identification of one's own stance on an issue and accepting multiple perspectives regarding complex issues; structuring learning as an integrated, multidisciplinary endeavor; focusing on a global perspective while advocating attention to local issues; and offering students opportunities to respond to their learning by taking action (Merryfield & White, 1996). Likewise, both platforms—education for sustainability and education for global competence—believe in the need to use inquiry-oriented approaches to learning to develop student knowledge and the need to develop information, communication, and analytical skills to deepen understanding and clarify the affective and evaluative orientations (values) that will motivate learners to respond outside of school in ways that engage the issue proactively.

In the remainder of this chapter, we offer examples of how sustainability education might be integrated into social studies using a conceptual framework for global competency developed under the sponsorship of the Asia Society and the Council of Chief State School Officers in the USA (Boix-Mansilla & Jackson, 2011). We use this framework strategically as a means of yoking sustainability education to a prevailing concern among many educational reformers, that is, preparing students for a world of heightened global competitiveness, or what might be called, borrowing from Thomas Friedman (2008), the “flat world” of global education.

In the context of pervasive rhetoric around the “flat world,” accountability, and reform of teacher education, it must be acknowledged that the challenges of infusing education for sustainability into social studies curriculum are currently quite formidable, despite the efforts of organizations such as Rethinking Schools and Facing the Future to provide models of sustainability-oriented curriculum in social studies. If the field is to move forward along these lines, then the desired academic and nonacademic knowledge, skills, and dispositions associated with sustainability education will need careful clarification (see Ladwig, 2010, for an interesting discussion of this matter). In light of the above pressures, we believe aligning sustainability education with education for global competence offers an avenue into social studies that will improve the odds that teachers, teacher educators, and policymakers take up this approach. Education for sustainability offers a critical lens with which to consider the economic, ecological, and social choices we make as human

beings who are entrusted with stewardship over the earth as well as a set of mutual obligations to fellow citizens of the globe.

Although we have argued for the affinities between sustainability and social studies, especially in the guise of global education, we raise two concerns: the first has to do with the wide variety of approaches to global education currently circulating within the field of social studies education (see Gaudelli & Heilman, 2009, for a useful typology) and the second involves the strong disciplinary orientation existing within secondary social studies. The latter reality may interfere with an orientation toward sustainability based on a holistic, integrated approach to curriculum (UNESCO, 2005).

With these concerns in mind, the following examples are suggestive of the possibilities within social studies. We offer new ways of thinking about topics that are standard fare in the social studies curriculum but might be transformed into sustainability-related public issues by modifying approaches to them to raise questions and pose problems that lead to knowledge formation, deliberation, and action. We introduce these suggestions by linking the suggested strategies to the four global competencies outlined in the Boix-Mansilla and Jackson platform developed for the Council of Chief State School Officers and the Asia Society cited earlier.

## **Global Competency One: Investigating the World, Both Near and Far**

Students should investigate the world beyond their immediate environment, framing significant problems and conducting well-crafted and age-appropriate research. (Boix-Mansilla & Jackson, 2011, p. 11–12)

Although we acknowledge that sustainability is not isomorphic with the “green” movement, one dimension of the sustainability framework is ecology or “public ecology” as some sustainability-oriented authors have called it (Robertson & Hull, 2001). Within the context of courses in history, students might consider the relationship of human societies to land, water, and air. Both historical and cross-cultural variations exist in this relationship, as books by Diamond (2011) and Steinberg (2008) emphasize dramatically.

Investigating such relationships within geography courses, specifically by looking more closely at the concepts of “place” and “interdependence,” fits neatly within the sustainability framework. Besides reviewing the National Geography Standards (Geography Education Standards Project, 1994), teachers might also draw upon questions and teaching strategies from geography books that stress a conceptual, interdisciplinary, and inquiry-oriented approach to the field, for example, Lambert and Morgan’s (2010) *Teaching Geography 11–18: A Conceptual Approach*.

From a contemporary perspective, students might investigate the mounting ecological problems that are likely to lead to the degradation of world ecosystems in the next 30 years. For instance, the US Department of Defense’s Quadrennial Defense Review (2010) recently determined that anthropogenic climate change will

contribute to food and water scarcity, increase the spread of disease, and may spur or exacerbate global mass migration. Likewise, the United Nations has determined that by 2050, the world population will rise to nine billion, thus dramatically increasing global demand for environmentally harmful fossil fuels such as coal and oil. Additionally, other ecological problems continue unabated. Forests, grasslands, wetlands, tundra, and deserts are continually being depleted, while the percentage of oceanic and fresh water “dead zones” grows exponentially each year. Continuing on with the themes of “place” and “interdependence,” students might look at their own and their communities’ contributions to these problems.

When introducing such themes in the classroom, the overall goal should be to critique media coverage of global ecological issues. An analysis of this theme in both preservice and in-service social studies programs is particularly important in light of the fact that the Center for Media Literacy (2009) estimates that the average person in the USA is exposed to more than 400 commercial images every day. Recent findings also link media exposure to profound social outcomes, such as how people relate to and treat the environment (Gilding, 2011). Trends such as these suggest that there is a need for social studies educators to generate higher order outcomes for learners so that they will be able to function as effective and informed citizens long after they leave the classroom.

For example, US high school students are repeatedly confronted with a barrage of advertisements pertaining to various types of new energy initiatives, ranging from “clean coal” to “third-generation nuclear power” to “wind power,” among many others. Each energy program is presented as a cure-all for the nation’s environmental ills yet with little analysis of the accuracy of such claims or the colossal economic and social undertakings that would be needed for such initiatives to have a lasting impact.

Ultimately, high school social studies educators need to provide their students with an understanding of the pros and cons of the energy policies presented to us. Students can then question whether various energy industries are acting in the public’s best interest or if their aims are more unseemly. For example, major news outlets have recently featured prime-time commercials from the American Coalition for Clean Coal Electricity (AACCE), asserting that “clean coal” technologies have been proven to reduce emissions of ash, sulfur, and heavy metals from coal combustion (American Coalition for Clean Coal Electricity, 2011). While certainly true, such advertisements fail to mention that carbon capture and storage technology—the key for reducing climate change—is many years away and has never been demonstrated to actually sequester carbon on a large scale. Likewise, advocates of wind and solar energy often fail to mention that associated initiatives will not have a major impact on climate change mitigation efforts for the next 20 years (Streeker, 2010).

While much of this energy discussion is scientific, the outcomes will affect the social, economic, and political fabric of the US policy in many domains. It will take years of intense policy negotiating to determine the best ways to approach such sustainability efforts. The most important first step for schools, then, is to begin a dialogue and debate, with social studies serving as a primary platform for doing so.

Only then will sustainability-oriented topics be moved out of what Eisner (1985) calls the “null curriculum” (important topics excluded from school settings) into meaningful learning opportunities for students.

## **Global Competency Two: Recognizing the Legitimacy of Competing Perspectives**

Students should recognize perspectives, others’ and their own, articulating and explaining such perspectives thoughtfully and respectfully. (Boix-Mansilla & Jackson, 2011, p. 11–12)

Because the world’s goods and services, including natural as well as man-made resources, are finite and distributed inequitably across societies, dealing with economic issues as part of a sustainability framework will inevitably lead to a consideration of the social and ecological factors shaping human history. If students are going to pursue questions related to the interrelationships of economics, ecology, and human society, they will need to come to terms with competing perspectives within and across human societies about the origins and remediation of the fundamental economics concept of scarcity. Within this competency, students will, for example, explain how differential access to resources and technology affects economic systems and quality of life (Boix-Mansilla & Jackson, 2011).

Likewise, they will need a framework for considering issues of fairness, justice, equity, and equality as a way of managing different perspectives about the distribution of the world’s goods. Inequalities in access to shelter, land, food, clean water, sustainable livelihoods, technology, and information pose challenges to human security, economic growth, and environmental sustainability (National Research Council, 2010). A useful introduction to considering social justice issues such as these might be found in Sandel’s book (2010), *Justice: What’s the Right Thing to Do?* Many students (and teachers) will need help in deliberating about the meaning of social justice, and this book provides a highly readable introduction to the topic.

In considering the problem of scarcity and social justice, one place to start is the limited nature of productive resources worldwide. Given the restricted nature of these resources, people must choose some goods and services while giving up others (Council for Economic Education [CEE], 2010). Students, parents, businesses, and governments make such choices daily by evaluating the opportunity cost associated with that choice. These groups must identify and systematically compare alternatives to make more informed decisions. Unfortunately, most economists agree that people often overlook relevant consequences of the choices they make (Ariely, 2010). Not surprisingly, most opportunity costs analyses ignore the social and ecological costs of their choices (Ecotrust, 2011). In investigating opportunity costs, students should consider how culture and societies influence consideration of opportunity cost across economic systems.

Economic systems use different methods to allocate goods and services. Individuals and organizations rely on various systems to determine what should

be produced, how it should be produced, and who will consume it (CEE, 2010). Whereas each system (command, market, traditional, majority rule, etc.) has its advantages and disadvantages, no one system will be able to satisfy all wants and needs. Individuals, groups, and organizations evaluate different methods by comparing the benefits and costs of each. Thus, students could be asked to evaluate how the current US economic model promotes sustainability or how this system contributes to economical, ecological, and social problems and their solutions, especially from a social justice perspective. Because the USA uses a market system, most economists compare this system with those found in other nations such as China, Cuba, India, Singapore, and the United Kingdom. Considering how other nations handle sustainability-related issues would be a useful contribution to class discussion.

Individuals, groups, and organizations stimulate economic growth through investment in productive resources such as equipment, factories, technology, infrastructure, and the education of people (CEE, 2010). The consequences of investment may vary. However, these investments should lead to an increase in the standard of living for people in an economic system. Given this widely accepted premise, an emphasis on global competency requires that students examine how varied access to resources shapes perspectives of different societies toward their economic systems (Boix-Mansilla & Jackson, 2011).

Historically, increases in per capita output caused by economic growth have helped alleviate poverty and raise standards of living (CEE, 2010). In teaching economics for sustainability, teachers can assist students in exploring the ecological and social consequences of economic growth. Some examples of questions to guide student learning in this area include:

- What occurs when economic growth results in an unequal distribution of raises in the standard of living?
- How do investments in new physical capital (factories and equipment) affect the social, political, economic, and ecological growth in an economic system?
- Which investments result in economic growth while maintaining the health of ecosystems? (Ecotrust, 2011)?
- What path should we follow to create a sustainable economy that also allows for economic growth?

Analyzing these questions can help students assess more completely the economic, ecological, and social costs and benefits of economic growth across localities, nations, and regions.

When teaching about sustainability in K-12 economics courses, social studies teachers must emphasize the idea that natural resources, such as land and water, are finite. The use of these factors of production does involve externalities, unintended environmental costs that occur during the production or consumption of a product or service (Ecotrust, 2011; Wilke, Peyton, & Hungerford, 1987). For example, the building of a new sports or entertainment complex might mean giving up the best alternative use of that resource, such as a public park or a nature preserve (CEE, 2010). Further, externalities may extend beyond one nation's borders.

When analyzing a problem such as this, students should move their focus beyond individual states and identify the relationships between externalities on a global scale and shifting patterns of inequality across nations (National Research Council, 2010). Teachers may ask students to evaluate how externalities from our carbon-based economy impact people across the world. Thus, students should examine the perspectives of neighbors beyond their own nation. The inclusion of the environmental externalities also makes possible a richer ecological and social analysis of the economic issues related to scarcity.

In educating students about sustainability, social studies teachers should aid students in analyzing the economic and ecological consequences of each economic system. For example, students may examine the major risks and consequences to natural and human systems in using a market-based allocation system (McKeown et al., 2002). In looking beyond the USA, students can also analyze how other patterns of production, allocation, and consumption affect ecological sustainability. Such an analysis enables students to look beyond local and national boundaries in gauging sustainability across economic systems.

Rawls (1996) has argued that a critical analysis of citizenship responsibilities can best contribute to learners' democratic enculturation since there is more of a perceptible effort to distinguish between biased and unbiased sources of information, weigh alternatives to solve problems, and predict consequences. His essential argument was that the individual citizen bears a great deal of responsibility for determining public policy outcomes. For instance, as Rawls noted, ideally, citizens should think of themselves as if they were legislators and ask themselves what statutes, supported by what reasons satisfying the criterion of reciprocity, they would think are most reasonable to enact (Rawls).

A wide-ranging body of literature also points to the development of democratic attitudes among social studies learners, which in turn, leads to responsible actions (Noddings, 2006; Parker, 2003). Kohlberg's (1981) research into moral reasoning development, for instance, has found that learners, particularly in adolescence, are drawn to the study and discussion of new concepts with which they do not necessarily agree. The cognitive dissonance or conflict of one's values caused by the presentation of unresolved debate serves as a motivational force and helps to develop learners' democratic dispositions for public discussion and responsible actions.

### **Global Competency Three: Communicating and Interacting Effectively**

Students should communicate ideas effectively with diverse audiences, bridging geographic, linguistic, ideological, and cultural barriers. (Boix-Mansilla & Jackson, 2011, pp. 11–12)

As Friedman (2008) makes clear in the conclusion to his book *Hot, Flat, and Crowded*, the economic, ecological, and social conflicts we face will need to be



deliberated through civic processes. Although technology can, perhaps, provide some mitigation of our problems, there are no “fixes” and certainly no “quick fixes” to the long-term dilemmas around sustainability. As global citizens, students will need to communicate effectively across differences of class, race, and culture and within highly competitive interactive settings marked by tensions over the increasing scarcity of the world’s natural resources.

Moreover, if the notion of global citizenship is to be successful as a pedagogical framework in the USA, social studies educators need to reflect carefully on the cultural investment in—and language used to characterize—American values of individualism, freedom, tradition, and science. In short, the language we generally use to interpret our lives.

In the classroom, social studies educators can examine the consequences of past environmental damages and lead their classes in important ethical discussions of the following questions:

- To what extent are we responsible for a growing ecological crisis?
- Why do we buy the things we do?
- How can we reduce our energy needs?
- What do we ultimately believe to be of importance for a good life?

Adjudicating differences related to personal and communal choices will require reflecting on values and developing communication and conflict resolution skills. Students will need to learn how to weigh and represent their own choices in terms of economic, ecological, and social resources (CEE, 2010). Students must also be able to articulate their understanding of alternative perspectives about how and why such decisions are made and consider the role values and judgments about cost-benefit relationships play in shaping personal decisions that have communal consequences (Boix-Mansilla & Jackson, 2011).

## Global Competency Four: Taking Action

Students should take action to improve conditions, viewing themselves as players in the world and participating reflectively. (Boix-Mansilla & Jackson, 2011, p. 11–12)

The public response to Rachel Carson’s *Silent Spring* (1962) is often cited as the beginning of strong citizen interest, particularly among American adolescents, in becoming part of an actual environmental movement. This effort first started to grow after the realization of the negative effects of industrial pollutants on human health through direct and indirect exposures to toxins like DDT as well as the contamination of groundwater from thousands of new landfills (Carson). Other ecological disasters, such as a 1969 fire on Ohio’s polluted Cuyahoga River, also captured the attention of millions of young television viewers as they witnessed oozing, toxic sludge engulfed in flames. Thousands of young Americans began to feel as if unnatural events were beginning to happen on a much larger



scale and that they needed to do something in order to conserve the Earth's resources (Nash, 1989).

In many ways, social studies curricula and ideas pertaining to sustainability have been dispersed through grassroots efforts on the part of individual teachers for decades. Today, the ubiquity of Internet communication technologies, particularly among America's youth, helps promote concern for the environment. In one recent example, high school students in an advanced placement social studies class at Isidore Newman School in New Orleans produced a video that was highly critical of The American Society of Civil Engineers (ASCE) for allegedly downplaying the structural failures of the levees system during an investigation of Hurricane Katrina thus increasing the level of environmental degradation and social harm. The well-produced 3-min video created by the students was viewed more than one million times on YouTube for 7 days, until the ASCE threatened a lawsuit. Although the video was soon removed, several newspaper editorials, such as those in the New Orleans *Times Picayune*, (Livingston, 2007), indicated that the students raised some legitimate questions about the lack of openness in the investigation of what went wrong before, during, and after Hurricane Katrina. Further, the fact that a world-renowned engineering association actually felt threatened by accusations made a small class of high school social studies students is noteworthy in itself, in that students everywhere now have the ability to spread their critiques and criticisms more easily in regard to what they believe is wrong with their surrounding environment (Livingston, 2007).

Despite such successes, the challenges posed by introducing sustainability into social studies classrooms are several and wide ranging. Namely, which sustainability-oriented problems are believed to be worth solving, according to whom, to what ends, and in whose favor? (Evans & Saxe, 1996). To engage with these questions, students would need all four competencies associated with being a global citizen. Questions such as these lie at the heart of education for sustainability and are well suited to deliberation within social studies classrooms. For example, the publications on the environment produced by the National Issues Forums have been used in many social studies classrooms.

Taking action is often conceived of as collective action, but it needs to involve a personal dimension as well. For example, McKibben (2007) suggests that, when dealing with sustainability problems, human beings need to cut back on excess, both personally and socially. Accordingly, this is a call for taking action against the status quo on both an individual and global level. From a philosophical perspective, this stance has been advocated by Singer in *The Life You Can Save: Acting Now to End World Poverty* (2009) where he recommends that individuals in wealthy nations voluntarily do with less in order to provide more for the poor worldwide.

Such decisions require systematic study of an interdependent global economy as one nation's current economic model affects other systems across the world (National Council for Social Studies [NCSS], 2010; UNESCO, 1997). As students develop new understanding of the implications of personal decision-making, social studies educators should encourage reflecting this new understanding.

## Conclusion

The National Council for the Social Studies promotes study of all the elements needed for dealing with sustainability through its curriculum standards. Indeed, many social studies teacher educators and teachers embrace sustainability's fundamental insights into the interconnected nature of ecology, economics, and social issues and the future of the planet. Moreover, many social studies educators, especially those with a focus on global education, promote the values of cosmopolitanism, internationalism, and ethical concerns for others who are not members of our own society but are affected by the choices we make (Appiah, 2007).

An urgent need exists for teacher educators to help teachers find ways to incorporate education for sustainability into their classrooms (McKeown et al., 2002). Teachers are the ones charged with helping young people to participate fully in a democratic society (Darling-Hammond, 2006). As we have argued throughout this chapter, social studies education stresses the need to reflect upon and deliberate about value conflicts, thus providing an ideal atmosphere for infusion of education for sustainability (UNESCO, 1997). To reorient existing teacher education for sustainability, social studies teacher educators must emphasize three priorities.

First, teacher education programs should prepare preservice teachers in ways that promote an understanding of sustainability in their own classrooms. Teacher educators need to provide opportunities for their students to discuss and debate these issues at local and global levels so they can better understand others' perspectives on these matters (UNESCO, 2005). Such opportunities will help them develop the skills and dispositions necessary for participatory citizenship (Hess, 2009). Further, such experiences will help students reflect upon and refine their own values orientation (McKeown et al., 2002).

Second, in order to assist teachers in promoting sustainability in their classrooms, researchers need to develop an understanding of how students think about sustainability. By expanding knowledge about the preconceptions students bring into K-12 classrooms, researchers and curriculum developers can design approaches that address preconceptions and misconceptions about sustainability issues in order to deepen knowledge about these complex issues.

Third, we know that a teacher's life experiences, beliefs, and assumptions influence their own perceptions and conceptions about sustainability; these factors will shape what they do in their classrooms. Because teachers serve as curricular and instructional gatekeepers (Thornton, 1991), it is important that social studies programs of preservice and in-service teacher education attend more vigorously to infusing sustainability issues into teacher education from an integrated, multidisciplinary perspective that is aligned with the global education competencies outlined here.

We recognize that what we are outlining here will be a complex and challenging agenda for the social studies. Despite the hurdles, bringing sustainability into social studies is just the sort of curricular move that has intrigued and motivated the field since its inception decades ago. By connecting sustainability education to the global competencies framework, we hope that this will provide stimulus to social studies leaders worldwide to move the field forward.

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# Chapter 13

## Infusing Sustainability Across the Curriculum

Wendy Church and Laura Skelton

### Introduction: A Broad Approach to Education for Sustainability

Education for sustainability can play a critical role in student learning. The nonprofit organization *Facing the Future* uses sustainability as a framework to engage students in learning by making academics relevant to their lives. Education for sustainability engages students in exploring real-world problems and solutions that relate to their lives. Students are engaged when they are actively involved in their learning, committed to the goals of the learning process, and able to devote focused attention to the learning task (Newman, Wehlage, & Lamborn, 1992). Research shows that engagement supports student learning; engaged students are more likely to excel academically (Center for Comprehensive School Reform and Improvement, 2007) and less likely to drop out of school (Bridgeland, Dilulio, & Morison, 2006).

*Facing the Future* approaches sustainability as a meaningful context for teaching knowledge and skills across the curriculum. The experience of *Facing the Future* shows that education for sustainability can be and is implemented effectively in a wide range of K-12 classrooms by using one of several general approaches. This chapter includes descriptions and examples of four such approaches:

- Sustainability as its own topic;
- Sustainability as a context for teaching core subjects;
- Sustainability as a unifying theme for classroom projects; and
- Sustainability as a unifying school-wide or district-level theme.

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W. Church, B.S., M.M., Ph.D. (✉) • L. Skelton, B.A., M.S.  
Facing the Future, Seattle, WA, USA  
e-mail: church10\_@hotmail.com; lauraskelton@gmail.com

Evidence of the success of these approaches is based on results from several studies that *Facing the Future* conducted on the use of sustainability across the curriculum.

Over the last 15 years, *Facing the Future* has worked to help educators in the United States and Canada incorporate global issues and sustainability into their K-12 classrooms. Support for infusing sustainability into classroom curricula is provided through a variety of tools, including:

- Curriculum resources (e.g., teacher lesson plans and student readings),
- Teacher professional development workshops and in-services,
- Service-learning tools and support, and
- Alignments with core subject-area learning standards.

In the process, *Facing the Future* has surveyed and interviewed thousands of educators around the country to learn what teachers need and how they incorporate education for sustainability into their teaching. During this time, *Facing the Future* has launched and grown global issues and sustainable solutions, curricular effort that annually reaches over 1,500,000 K-12 students in all 50 US states and around the world.

*Facing the Future* strives to give as many students as possible opportunities to learn and explore global challenges and sustainable solutions. To that end, *Facing the Future* supports educators in teaching sustainability in ways that fit their particular needs, whether they need to reinforce mathematic concepts or teach persuasive writing. Professional development is a key supporting resource that helps educators discover and implement strategies that work for them. It also allows them to see how other teachers are incorporating sustainability curriculum resources into their classrooms in unique and dynamic ways.

## **An Overview of Education for Sustainability in the USA**

The concept of sustainability means different things to different people. *Facing the Future* defines it broadly as the notion that a generation of people can sustain themselves without inhibiting the ability of future generations to do so. While some people use the term “education for sustainability” interchangeably with “environmental education,” education for sustainability differs from environmental education in that it necessitates integration of social and economic concerns with environmental concerns. *Facing the Future* takes this idea one step further, using the broader term “global sustainability,” which refers to applying the sustainability concept on a global as well as local level, recognizing that at this time in human development, we are all very much connected.

Six broad interconnected issues involved in global sustainability are related to population, poverty, environment, consumption, conflict, and quality of life. Specific topics of current or historical interest, such as climate change or human health, fall

under the umbrella of these broad issues. In addition, there are several skills that many believe to be critical to global sustainability. These include:

- Taking a global perspective, including recognizing how global and local issues are connected,
- Understanding how systems operate,
- Thinking critically, and
- Making informed decisions.

Global sustainability has become increasingly prevalent in K-12 education. In the mid-1990s, the US President's Council on Sustainable Development published *Education for Sustainability: An Agenda for Action* (1996). This document called for the inclusion of sustainability in the K-12 curriculum as well as in the preparation of teachers. Since that time, various states and districts have begun to develop their own initiatives to support education for sustainability. Some states have adopted learning standards around sustainability (e.g., Vermont and Washington), citing the importance of sustainability as a meaningful and engaging context for students to acquire knowledge and skills that will prepare them for life beyond school (Office of Superintendent of Public Instruction [OSPI], 2009; Vermont Education for Sustainability, 2004). Some school districts have infused sustainability themes across their curricula (e.g., Tahoma School District in Washington and Gladstone School District in Oregon) in order to prepare students to be active contributors to their communities (Gladstone School District, 2011; Tahoma School District, 2009).

The National Association of Independent Schools (NAIS) has also developed an emphasis on sustainability in schools that extends from teaching to practice. One of their dimensions of sustainability is environmental sustainability. According to NAIS, "schools committed to environmental sustainability emphasize an interdisciplinary and holistic approach to fostering the knowledge, skills, and attitudes needed to build a sustainable world for present and future generations" (National Association of Independent Schools [NAIS], 2010a). Their sustainability focus also includes a global component, seeking to "...help students become global citizens and global leaders, and to assist schools and their students in making contributions across borders" (NAIS, 2010b).

## **Where and How Education for Sustainability Is Being Taught**

Information collected by *Facing the Future* indicates that education for sustainability is being successfully integrated into classrooms in every state, at all grade levels, and in most subjects. Each year, *Facing the Future* surveys educators who have attended a professional development session related to education for sustainability or who have downloaded or purchased sustainability curriculum resources. In a 2009 survey of approximately 1,500 of these educators, over



1,000 (59%) reported they had incorporated teaching for global sustainability into their classrooms. Of those, 762 were K-12 teachers. Most of the K-12 teacher respondents indicated that they teach in public schools (71%); they include a mix of high school (59%), middle school (42%), and elementary teachers (16%). The K-12 teachers who completed the survey represent varied classroom settings and communities from 48 different states: the classrooms of 50% of these teachers include a significant percentage of students on free and reduced lunch programs, and over 30% of their students are nonwhite. Among these teachers, global sustainability was used as a context within which to teach core subjects (32% total in mathematics, science, reading, writing, social studies) as well as in its own right (61% taught sustainability as its own topic or theme). The teachers worked sustainability into their teaching using *Facing the Future* curriculum resources in a variety of ways, including:

- 1–2-day activities; up to 25 lessons a year used as “hook” activities to engage students in a core subject (60%).
- 1–2-week thematic curriculum units, each containing lessons and student readings (27%).
- Supplemental reading for a unit or course (11%).
- Core reading materials as the basis for an entire course focused on sustainability (4%).

A 2008 survey of Washington State teachers, conducted by the Office of Superintendent of Public Instruction (OSPI) in partnership with the Environmental Education Association of Washington, revealed similar patterns of how teachers are incorporating education for sustainability into their classrooms. For example, 58% of the approximately 1,300 teachers surveyed reported teaching education for sustainability. Much of the rest of the survey data aggregated teachers who teach education for sustainability with those who teach environmental education. The majority of these teachers incorporated environmental and sustainability education into science classrooms; environmental and sustainability education was incorporated into social studies and language arts classrooms to a lesser degree. High school students were most exposed to environmental and sustainability education, whereas elementary students received the least instruction. Similar to the findings from *Facing the Future*, OSPI’s survey revealed that occasional lessons were the approach to teaching environmental and sustainability education, followed by using a unit or theme on environment and/or sustainability. Six percent of teachers surveyed reported teaching environmental or sustainability education as an entire course (OSPI, 2008).

## **Benefits of Education for Sustainability**

There are a number of reasons why education for sustainability is needed in K-12 education. Three major benefits of education for sustainability are summarized here.

### ***Benefit 1: Improves Student Engagement***

Student engagement in learning is key to academic success. In a 2005 study of US high school dropouts, nearly half cited lack of engagement as their major reason for dropping out of school (Bridgeland et al., 2006). In a 2009 survey of 40,000 US high school students, students reported that they were most engaged when able to work with and collaborate with classmates through activities such as discussions, debates, group projects, student presentations, and role plays (Yazzie-Mintz, 2010).

*Facing the Future's* pedagogical approach is to encourage student engagement through collaborative activities related to global sustainability. Real-world sustainability issues, especially when taught through collaborative hands-on activities, can engage students in a way that other topics or contexts do not. While there is no hard data linking improved test scores to sustainability programming, there are studies that link student engagement to improved academic performance (e.g., Finn, 1993; Kirsch et al., 2002).

Readings and activities that enable students to grapple with real-world issues and provide opportunities for reflection and synthesis make learning authentic. For example, a teacher of English language learners reported on one *Facing the Future* survey:

The students who are in the achievement gap are engaged by the curriculum because it speaks to their truths. The curriculum doesn't leave anyone out of the picture. All people are represented and an understanding of their lives is incorporated into the lessons.

*Facing the Future* conducts annual surveys to learn about teachers' curriculum and professional development needs and habits. Year after year, teachers overwhelmingly agree that teaching real-world sustainability issues leads to higher student engagement. Each year, over 85% of teachers surveyed say that they observe an increase in student engagement with the use of global sustainability curriculum resources. A middle school social studies teacher noted how a lesson on depletion of natural resources helped engage all of her students: "The hands-on activities brought in another dimension of learning and brought my tougher-to-reach kids into the lesson."

### ***Benefit 2: Builds Essential Skills***

Skills such as critical thinking, collaboration, and communication are essential for students to succeed as community members and workers in the twenty-first century (Wagner, 2008). Sustainability concepts can provide an integrated context for developing these twenty-first-century skills. One teacher who incorporated sustainability lessons into his classroom reported in a *Facing the Future* survey:

The activities encourage students to think of creative problem-solving strategies and to examine a problem from many sides. This transfers to them looking for different sides on current events issues and seeking out varying points of view, and sometimes conflicting expertise, to develop a position of their own.

Because education for sustainability involves studying current affairs and often complex global connections, the material can help build critical thinking skills as students consider the many facets of an issue. Climate change is a good example of this, as it is an interdisciplinary topic that connects science to related social and economic issues. Determining leverage points for positive action on climate change requires students to use critical thinking and evaluation skills. Table 13.1 shows how an education for sustainability framework (in this case, climate change is the context) can be used to teach required high school science content alongside high-level cognitive skills such as critical thinking and communication. Aligning sustainability content with national and state education standards supports teachers in incorporating sustainability into existing curricula.

### ***Benefit 3: Connects Students to Their Community and Inspires Civic Action***

In addition to its annual teacher surveys, *Facing the Future* conducts a number of studies with students in order to assess their knowledge, beliefs, and behavior before and after learning about global sustainability in their classrooms. The following quotes from seventh and ninth grade students made after participating in global sustainability programming in their classrooms show the kinds of changes in attitudes and worldviews that can occur when sustainability is taught:

*I used to say I wanted to make a difference when I grow up. After this [global sustainability unit] I realize that I can make a difference right now.*

*It made me think about what is happening in the world and how much the way I live is affecting it. This unit really changed my insight on life and it really makes me want to try to do something.*

Education for sustainability is most powerful when an action component, such as a service-learning project, is included. Service learning integrates meaningful community service with instruction and reflection to teach civic responsibility and strengthen communities (National Service-Learning Clearinghouse, 2011). In fact, education for sustainability by definition strives to prepare students to make informed decisions and to participate in solutions to local and global challenges. Sustainability topics such as poverty and international conflict can be overwhelmingly complex or depressing to students if they are not also learning about positive steps being taken to create sustainable communities or how they can work to create a future of their own design. A key component of education for sustainability is helping students to see that solutions exist and that we can build healthier communities while addressing local and global challenges.

A specific example of global sustainability being infused into classrooms illustrates the benefits mentioned above. In 2011, *Facing the Future* surveyed 171 K-12 teachers who used a 2-week curriculum unit to teach about interdisciplinary consumption issues: *Buy, Use, Toss?: A Closer Look at the Things We Buy* (Facing the Future, 2010a). The *Buy, Use, Toss?* Unit consists of ten lesson

**Table 13.1** Sample education for sustainability student learning objectives mapped to National Science Standards using climate change as the context

Sample climate change learning objectives	NSES A: Science as inquiry	NSES B: Physical science	NSES C: Life science	NSES D: Earth and space science	NSES E: Science and technology	NSES F: Science in personal and social perspectives
Investigate the relationship between atmospheric carbon and global surface temperatures	X	X	-	X	-	-
Communicate the ways in which particular organisms will be affected by climate change	-	-	X	-	-	X
Explore ways to reduce an individual's carbon footprint	X	-	X	X	-	X
Take a position on whether or not a particular energy source should be used in the future	-	X	-	X	X	X
Predict how a rise in average global temperature might impact particular regions	X	-	X	X	-	X
Determine which of several regulatory systems could reduce carbon emissions most effectively	-	-	-	-	X	X
Discuss how socioeconomic status and relative affluence relate to climate change	-	-	-	-	-	X
Develop a policy for addressing global climate change	-	-	X	X	X	X

Climate change learning objectives are taken from the 2-week curriculum unit, *Climate Change: Connections and Solutions* (Facing the Future, 2007). For a complete explanation of the NSES learning objectives, see the National Science Education Standards (National Research Council, 1996)

plans that guide students through an exploration of the system in which goods are produced, consumed, and discarded. Students are asked to analyze the sustainability of this system, determining how consumption can benefit people, economies, and environments.

Of the teachers who reported using the curriculum unit, the majority (61%) teach in K-12 public schools. An additional 26% teach in K-12 private schools. These educators teach in 38 US states and 4 Canadian provinces; 42% teach about sustainability issues in science courses, and 32% teach these issues in social studies courses.

When asked about specific benefits of using global sustainability curriculum resources, they reported the following student outcomes (percentage of teachers who agree is shown in parentheses):

- Increased student engagement (93%).
- Increased students' critical thinking skills (94%).
- Increased students' global perspective (95%).
- Increased students' belief that they can make a difference on global issues and sustainability (86%).
- Increased likelihood of students taking action to help solve global issues (77%).

In addition to the benefits of improved student engagement, building essential skills and sustainability curriculum resources can also support student achievement in core subject matter. Some 77% of teachers surveyed believed that the exploration of consumption issues increased students' achievement in core subject matter.

## **Four Strategies for Infusing Sustainability Across the Curriculum**

Global sustainability is currently incorporated in a wide variety of ways into classrooms, schools, districts, states, and nonformal education settings. Four distinct approaches to incorporating education for sustainability into classrooms are described here.

### ***Strategy 1: Sustainability as Its Own Topic***

In some cases, teachers and schools may be able to teach sustainability as a stand-alone subject, not necessarily tied to particular core content learning standards (e.g., mathematic skills). Supplemental curriculum resources, particularly activity-based lessons, are commonly used to incorporate education for sustainability into classrooms. An example of this approach is described below.

Imagine a classroom where students are divided into small groups, each of which has been provided a bowl of sugar-shell-coated chocolate candies. The students are

told that the bowls are oceans and the candies are fish. Students are given straws with which to “fish” and told that there will be several fishing seasons. In order to survive until the next season, each student must catch two fish. After each fishing season, one new candy is added for each one left in the bowl; students who have taken all of their fish in the first season are faced with an empty ocean that will not be replenished. As the lesson goes on, a small number of students are given spoons with which to fish (instead of straws); this new “technology” makes it much easier to fish.

As this lesson progresses, it is often the case that one or more groups of students will empty their oceans. Because they have not been instructed otherwise, these students may then migrate to other students’ oceans and try to harvest their fish. This predictably leads to conflict – imagine students’ reactions to outsiders scooping up their “fish.” When the lesson is over, the teacher can take the discussion and subsequent work in a number of directions. For example, students can explore the idea of sustainable harvesting or the ways in which resource depletion connects to emigration and conflict, all of which link to current global realities. One high school history teacher had this to say after using this activity in her classroom: “*Hands-on activities generate an experience that reaches many students who cannot connect with text. The ‘Fishing’ activity has supplemented my current unit and allowed students to visualize the impact on our oceans, rivers and streams.*”

Many educators are able to use more than a single lesson to teach sustainability. They may teach a series of activities together as a thematic unit. Units are often built up from simple activities, such as the fishing lesson presented above, by integrating the activities with readings and projects.

### ***Strategy 2: Sustainability as a Context for Teaching Core Subjects***

Global sustainability provides an authentic and engaging context for teaching core subjects such as language arts and mathematics. *Facing the Future’s* textbook, *Making Connections: Engaging Students in Language, Literacy, and Global Issues*, employs this approach (Facing the Future, 2010b). *Making Connections* was developed in response to the needs of teachers of adolescent English language learners and striving readers; they reported wanting to help build students’ literacy within the context of age-appropriate content that would challenge and engage students. Accordingly, *Making Connections* was developed with best practices for language arts instruction in mind in order to help students build reading, writing, speaking, and listening skills within the context of real-world sustainability topics such as quality of life, community development, and environmental resources.

To determine the efficacy of this approach, *Facing the Future* conducted a study using student pre- and posttests. Thirteen classrooms participated, totaling 245 students. The classrooms represented both urban and rural areas from eight different states: Texas, Massachusetts, Florida, Washington, Arkansas, Colorado,

New York, and New Hampshire. Tests were administered before and after teachers used one or more of the chapters in *Making Connections*. Each test consisted of questions designed to assess curriculum effectiveness through reading comprehension vocabulary, and content knowledge. Pre- and posttest scores were compared, using means and t-test that measured whether or not the change between the pre- and posttest scores was statistically significant.

Average improvement of all students in reading comprehension and vocabulary was 17%; even greater improvement (an increase of 21%) was observed when students who scored 70% or better on the pretest were excluded.<sup>1</sup> One high school teacher whose students participated in this study reflected on the use of sustainability as a context for teaching language and literacy:

The unit I worked with had a wide variety of comprehension strategies that emphasized phonemic awareness, fluency, background knowledge and vocabulary, and were all supported with high interest discussion and writing activities. The topics and activities are engaging and relevant to teens – many intervention/remediation programs lack this.

### ***Strategy 3: Sustainability as a Unifying Theme for Classroom Projects***

Global sustainability provides an authentic platform from which to base a wide array of projects. Projects within a curriculum may take several different forms. Project-based learning is a pedagogical approach that requires students to respond to a complex question or problem while building skills such as collaboration and communication. Projects may also be incorporated into a curriculum in order to fulfill a graduation requirement (i.e., senior projects) or through the lens of service learning (which extends classroom instruction to provide meaningful community service). The following example illustrates how the social justice element of sustainability was used as the context for a service-learning project at a public school in Atlanta.

In a 4th and 5th grade (ages 9–12) Connections class at Morris Brandon Elementary, students went beyond merely learning content about social justice issues and engaged in a service-learning project to benefit CARE, a nonprofit organization that fights global poverty. To jump-start this topic in her class, the Connections teacher invited a representative from CARE who had spent several years in Kenya as a refugee from Uganda to speak to the class. After hearing this first-person account of life as a refugee, students participated in a simulation-based lesson developed by *Facing the Future* called “Seeking Asylum” (*Facing the Future*, 2006). Through this lesson, students experienced the difficult choices and struggles facing refugees and internally displaced persons (IDPs). During the simulation, students are told that civil war has broken out, forcing them to flee

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<sup>1</sup> Scores were normally distributed. Significance of improved scores for aggregate data:  $t=11.52$ ,  $p<0.001$ , Cohen effect size=0.7 (large). Significance of improved scores for students scoring less than 70% on pretest:  $t=11.35$ ,  $p<0.001$ , Cohen effect size=1.0 (large).

from their homes; they have 2 min to decide what they want to take with them. Students who remember to bring their identification cards become refugees, while the others end up in an IDP camp. Each group has to devise a plan for what they will do to survive.

In addition to the simulation, students researched refugee issues on select Web sites and read articles about real refugee situations. To raise money for CARE, the class did a “refugee walk.” During one 40-min class, students walked as many laps on the school track as possible, carrying backpacks, blankets, and other household items to simulate the refugee situation. The students had solicited pledges for the amount of laps they could walk. This project allowed students to provide authentic service to refugee communities by applying what they learned in their academic curriculum.

### ***Strategy 4: Sustainability as a Unifying School-Wide or District-Level Theme***

In a handful of schools and districts around the country, sustainability is an integrating context across subjects and grades. Education for sustainability can provide a framework not only for curricular innovation, it can also be used to incorporate school infrastructure into learning. For example, students in a school that prioritizes global sustainability might learn about the implications of nonrenewable resource use in a science class and then implement energy efficiency measures in their school building.

Explorer West Middle School, an independent school in Seattle, successfully teaches sustainability across the curriculum. Students of color make up 20% of Explorer West’s student body; 24% of students receive financial aid. In 2005, the faculty, administration, and board tasked Explorer West with building a school-wide culture of sustainability. A line from their mission statement speaks to this commitment: “Explorer West views the complexity of adolescence as a unique window of opportunity to develop the diverse academic, creative, and social skills required for a sustainable future.” Consequently, faculty revised the scope and sequence of their curriculum to infuse education for sustainability across the curriculum – from science to music.

Each year, the school focuses on a specific theme under the larger umbrella of sustainability. Past themes have included global health and sustaining families. Teachers start the school year with an in-service to explore ways to bring the year’s sustainability theme into their courses. For example, students might learn about sustainable agriculture in a science class, practice global citizenship in social studies, and read culturally diverse texts in English.

In addition to classroom-based learning, students participate in service-learning projects and wilderness experiences throughout the school year. All of these activities are supported by practical applications of sustainability in the school building, such as recycling and energy efficiency programs. In 2007, Explorer West was recognized for its commitment to sustainability when it received the NAIS Leading



Edge Award for Environmental Sustainability. Explorer West has also received two awards from the Washington State Department of Ecology to support its sustainability initiatives.

## Infusing Sustainability Across the Curriculum: Getting Started

The variety of approaches to incorporating sustainability into existing curricula and educational settings suggests that teachers from many different situations can teach sustainability in ways that are appropriate for their unique circumstances. While school- or district-wide initiatives to incorporate education for sustainability can build sustainability into all facets of a student's education, even small steps such as incorporating 1-day lessons can be meaningful, as demonstrated earlier in this chapter.

Motivations for teaching about sustainability may also vary. Sustainability can provide a meaningful context for teaching and applying subject-area knowledge and skills. It can also be a means to engage students in classroom learning and to help them build essential skills they will need as workers and community members. Because the reality is that many teachers do not or cannot teach about sustainability as its own subject, *Facing the Future* designs resources that teach core subject knowledge and skills (from math calculations to media literacy) within the context of critically important sustainability issues students will face as they get older. Infusing sustainability across the K-12 curriculum is a multidimensional effort, helping students across the country to think critically, develop a global perspective, and create positive solutions for the future.

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**Part V**  
**Nonformal Education Serving**  
**Formal Education**

# Chapter 14

## Zoos and Aquariums and Their Role in Education for Sustainability in Schools\*

Joe E. Heimlich, Vicki Connelly Searles, and Allyson Atkins

### Education in Zoos and Aquariums

Zoos have been around for hundreds of years. Historically, animal collections were amusements for royalty or the very rich; gradually, these collections became amusements for the masses (Baratay & Hardouin-Fugier, 2004). The modern zoo or aquarium is an intentional collection of animals used to further the cause of conservation through systematic education and research (Rabb, 2004). Today, the four goals of contemporary, Association of Zoos and Aquariums (AZA)-accredited institutions include (1) conservation, (2) research, (3) education, and (4) recreation (Churchman, 1987). These goals push institutions to present conservation education in ways that inspire visitors and audiences to take environmentally responsible action (Brewer, 2001).

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\*This chapter describes the active role that zoos and aquariums play, providing educational services to schools and the public. Zoos and aquariums respond to global challenges as well as contribute to local education for sustainability.

J.E. Heimlich (✉)

Ohio State University Extension, Columbus, OH, USA

COSI, Columbus, OH, USA

Institute for Learning Innovation, Edgewater, MD, USA

e-mail: Heimlich1@osu.edu

V.C. Searles

Cleveland Metroparks Zoo, Cleveland, OH, USA

e-mail: vms@clevelandmetroparks.com

A. Atkins

Disney's Animals, Science, and Environment, Bay Lake, FL, USA

e-mail: Allyson.Atkins@disney.com

Over the last few decades as education has become critical to the role of zoos and aquariums, technology, which traditionally focused on displays to maximize animal viewing, has begun to be used for media designed to communicate directly with visitors (Kisling, 2001).

Zoos and aquariums have a conservation mission at their core, and their education efforts are designed to further that mission. Although few offer programs named strictly as education for sustainable development, the intersection of conservation and sustainability ensures that many of the conservation messages are tied to the sustainability elements of people, finances, and the animal and its habitat, placing these programs squarely in the education for sustainable development (ESD) arena.

Although there are many issues that impact sustainability, one issue in particular that zoos and aquariums tend to focus on quite heavily is the topic of habitat loss. Habitat destruction remains the greatest threat to wild animals (Ehrlich & Ehrlich, 1981; Simberloff, 1984; Wilcove, Rothstein, Dubow, Phillips, & Losos, 1998; Wilson, 1988). This destruction is often due to sprawling communities, extraction of resources, farming, or ranching (Hansen et al., 2002). Thus, people collectively create situations, often unintended, in which demand for space or resources causes the loss of habitat for wildlife in an interconnected and interdependent web among social, environmental, and economic considerations.

Zoos and aquariums have diverse audiences to consider when planning how to meet their conservation mission. For most zoos and aquariums, the general visitors tend to be intergenerational groups, usually families. However, zoos and aquariums also have on-site educational programs for schools, teachers, youth groups, community groups, early childhood, and others. Most zoos and aquariums have outreach programs that go into local communities and schools as well as distance education programs, which connect distant school groups with the institution's educational programming and animals. Nevertheless, of the many audiences, schools have historically been a major focus and priority for educational programming. Even as schools have experienced budget cuts that resulted in reduced support for field trips and as schools have increasingly been required to focus on state adopted curriculum standards, school programming remains an important component in their education programs and departments. Zoos and aquariums have also experienced budget cuts in recent years that have necessitated reductions in school outreach programs.

## **Zoos and Aquariums and Schools**

Although most zoos and aquariums have their own unique relationships with local schools, there are six commonly used approaches for engagement with schools:

1. Outreach to schools,
2. Field trips,
3. On-site programs,
4. On-site courses,

5. Electronic education/distance learning, and
6. Teacher workshops/training.

*Outreach to schools* involves the zoo or aquarium education staff visiting a school. These outreach programs are often shaped around specific state or national grade level standards. Institutions often elect to focus on a particular grade, theme, or geographic region based on the needs of local schools. Strategies for providing outreach to schools include one-time classroom presentations, multiple-classroom visits, grade-based and class-based visits, and large group assemblies. Most outreach programs are science-based. Many utilize education program animals, which are animals presented either within or outside of their normal exhibit or holding area and intended to have regular proximity to, or physical contact with trainers, handlers, or the public, or to be part of an ongoing education/outreach program.

*Field trips* are outings for groups organized by a school where the students typically leave the school grounds. Field trips usually engage the students in an informal visit, sometimes including activities or educational programs designed by the zoo or aquarium but conducted by the classroom teacher. On some occasions, field trips include a short introductory program presented by the zoo or aquarium staff followed by students' free exploration of the exhibits. A common approach for field trips is for the institution to provide to the teachers an exploratory activity such as a scavenger hunt as a way to assist in utilizing the institution in some organized fashion.

*On-site programs* are usually one-time experiences for a class. These experiences are often up to three hours in length and include lessons taught by zoo or aquarium educators at the zoo or aquarium; this staff-led lesson is the primary distinction from the field trip. On-site programs are often tied to educational standards (e.g., state or school district) as this provides additional justification for the schools to take trips to zoos or aquariums.

*On-site courses* are courses offered by and/or at the zoo or aquarium for middle-school, high-school, or college credit. In many cases, the high-school courses are higher-level science courses. For college credit, many courses are codesigned by the zoo or aquarium and the school. "Zoo school" is another model of interaction with on-site courses. In some "zoo schools," the zoo offers a specific series of courses within science and social science disciplines. In other programs, the "zoo school" offers a comprehensive high-school experience.

*Electronic education* programs are usually live, real-time programs transmitted to schools via the internet or other media in which zoo or aquarium staff, with animals, interact with the class(es). Electronic delivery strategies have been used to extend the reach of zoos and aquariums into schools for decades. Today, some zoos and aquariums offer special distance learning opportunities such as veterinary, animal nutrition, and animal enrichment programs. Other institutions offer live interaction with prerecorded animal interactions.

*Teacher workshops and teacher professional development programs* are offered by most zoos and aquariums. These workshops often relate to biology, conservation, or

environmental science and are built around a topic of interest to teachers. Depending on the relationship of the institution with the school district(s) in its area, some workshops can provide either professional development or college credit, and some include accreditation or license renewal hours. In a few instances, zoos and aquariums offer graduate level courses and collaborate with local universities in degree programs such as Miami University's Advanced Inquiry Masters Program offered through Brookfield Zoo, Cleveland Metroparks Zoo, Cincinnati Zoo, and Woodland Park Zoo in Seattle.

## **Past Education for Sustainability Efforts in Zoos and Aquariums**

Historically, zoos and aquariums have worked together, often with external partners, to create shared conservation education programs. Some of these programs have strong connections with education for sustainable development. In addition to the in-house programs that many institutions have developed to address ESD, there have been a number of efforts at the national level that will be described briefly here.

*Suitcase for Survival.* *Suitcase for Survival* is an outreach program developed primarily for teachers to use in their classrooms (USFWS, 2011). This partnership among the US Fish and Wildlife Service (USFWS), AZA, World Wildlife Fund, National Oceanic and Atmospheric Administration (NOAA), Fisheries Services' Office for Law Enforcement, and TRAFFIC North America was designed to address the need for a national education program focused on wildlife trade and biodiversity. Since 1991, the program has raised awareness about the devastation caused by illegal wildlife trade worldwide and has helped consumers understand the importance of biodiversity and how their buying habits affect biodiversity. The USFWS and NOAA provide wildlife trade artifacts that have been confiscated at ports of entry including such items as carved ivory, tiger bone items, crocodile skin products, and sea turtle jewelry. After all litigation involving a confiscated artifact has concluded, it is placed in the "Suitcase" program for loan to teachers through zoos and aquariums. The kit also contains an education module, *Wildlife for Sale: An Educator's Guide to Exploring Wildlife*, focusing on environmental, economic, and social issues. Teachers can request the kit from over 175 institutions to use the lessons, activities, and artifacts with their classes.

*Aquatic Invaders.* Working with the NOAA extension program Sea Grant, a consortium of aquariums developed an on-site theatrical program designed to incorporate local endangered aquatic species and invasive species that have been introduced into local waterways. *Aquatic Invaders* has themes of sustainability woven into it, but the focus is principally on individual activity to reduce human introduced threats in the water.

*Bushmeat Crisis.* The Bushmeat Crisis Task Force (2009) was a strong, shared program related to sustainability that was implemented across zoos and, to a lesser degree, aquariums. Zoos developed many on-site and school-based programs around the mes-

sages of reducing illegal poaching for bushmeat. The program tied together local and individual economies, social issues such as survival of local villages, and environmental issues. The manner in which the program interwove the environmental, economic, and societal nature of poaching resulted in a strong program focus on sustainability.

*Amphibian Conservation.* In 2008, the international zoo and aquarium community coordinated a campaign addressing the global amphibian conservation crisis. Professionals from the conservation world met, discussed, and gathered resources in an effort to slow the decline of amphibian populations due to habitat destruction and the concurrent spread of the deadly *Chytrid* fungus. Specifically, AZA specialists gathered resources to assist members in the areas of conservation, husbandry, grassroots advocacy, and public education. They pulled together field biologists, experts in animal management under human care, advocacy groups focused on gaining government support, and educators focusing on engaging school and community support from each region. Educators conducted teacher workshops, education programs at their institutions, and special events dedicated to inspiring personal action and sustainable practices. As a result of these efforts, programs on amphibians at zoos and aquariums around the world were strengthened, and students across North America became aware of the interdependency of life on earth (Pavajeau, Zippel, Gibson, & Johnson, 2008).

Through efforts of individual AZA-accredited educators, an activity kit was produced through the AZA's Conservation Education Committee. This kit contains lesson plans and activity materials to assist zoos and aquariums in offering programs and experiences to all guests, including school groups, on the issue of global amphibian conservation. Zoo and aquarium staff focused heavily on education for sustainability throughout the programs and activities tied to this campaign using amphibians as a conduit to discuss local environmental, social, and economical activities. Although 2008 was declared to be the Year of the Frog by the zoo/aquarium community, the work to address this global crisis continues as can be seen in the ongoing "Spring Forward" events celebrated at zoos and aquariums in conjunction with the changing of daylight savings time, many of which continue to feature amphibian sustainability programs.

*Earth Day Events.* Every year, more than 120 AZA-accredited institutions across the USA celebrate AZA's *Party for the Planet*<sup>TM</sup>, making it the largest multisite Earth Day (April 22) celebration in North America (Association of Zoos and Aquariums [AZA], 2010). The *Party* event is an opportunity to connect zoo and aquarium visitors, schools, youth groups, and families throughout the country with nature and conservation. Festivities feature environmental education activities at the institutions, traveling educational programs conducted by educators at schools and community events, animal encounters, festivals showcasing environmental and sustainability groups, lectures, and many other conservation-related experiences. Support materials are provided annually to all participating AZA-accredited zoos and aquariums as a way to support and encourage shared, consistent messages tied to the specific theme of that year. EarthFest, the longest running Earth Day Festival in the nation held annually at Cleveland Metroparks Zoo, attracts up to 50,000 urban, suburban, and



rural attendees; 175 exhibitors; and 900 volunteers (Earth Day Coalition, 2011). The Zoo's partner, Earth Day Coalition, has organized the event since its inception. Activities include the EcoPassport Tour, which takes visitors through exhibit areas such as local and organic foods, waste reduction, and green home improvement. The participants visit five areas where they are introduced to key concepts through hands-on activities and receive take-home sustainability tips from experts. Prior to the *Party for the Planet* day itself, K-12 students are able to participate in an annual art, poetry, and essay contest addressing an environmental issue.

*Seafood Watch.* One of the most widely used education for sustainability programs among zoos and aquariums is *Seafood Watch*. This program, which is managed by the Monterey Bay Aquarium, is designed to raise consumer awareness about the importance of buying seafood from sustainable sources. Seafood Watch materials offer recommendations regarding which seafood to buy or avoid as well as providing help to consumers interested in becoming advocates for environmentally friendly seafood (Beggs, 2006). Some zoos and aquariums have incorporated the use of Seafood Watch into their school and youth programs including high-school sustainable seafood recipe contests (Koldewey, Atkinson, & Debney, 2009), teen volunteer interpretive programs, and handheld aquarium inquiry activities tested by California school environmental clubs (Aleahmad & Slotta, 2002). A number of aquariums, and even some zoos, have also incorporated sustainable seafood messaging into exhibits, interpretive signs, and experiences.

*Climate Change.* Much work is taking place in the arena of climate change not only at an AZA level but also in individual institutions, consortiums of organizations, and a variety of targeted partnerships. The AZA has identified two goals as part of their climate change initiative: (1) member institutions will reduce the climate impacts of their own operations and (2) AZA will develop a national education, communications, and marketing program (AZA, 2009). A number of individual zoos and aquariums are coordinating their efforts to ground interpretation about climate change with information from research in social and cognitive sciences, including conservation psychology, in order to find effective ways to translate climate change information to be salient, relevant, and actionable for their audiences. A primary outcome of this intense collaboration is to engage visitors, including teachers and students, in ways that lead to sustainable actions that ultimately combat climate change. Numerous studies, such as the NOAA-funded "National Coalition of Aquariums Educating about Climate Change," are expected to further this work and ultimately result in usable tools, resources, and materials.

*Palm Oil Crisis.* The number one threat to wild orangutans is unsustainable palm oil production practices. The *Palm Oil Crisis* program, as conducted by many zoos and aquariums, includes focusing on in situ methods of farming and community livelihood programs as well as a focus on consumer activity in the USA. Efforts to address this problem from a consumer perspective have primarily been led by the AZA Orangutan Species Survival Plan (SSP) as well as a number of individual AZA zoos, in particular the Cheyenne Mountain Zoo. To encourage positive conservation actions connecting to this issue, online educational materials have been produced for use

with teachers and students. Additionally, zoos host annual special events focused on this issue as another way of increasing awareness. One resource used in these programs is the Palm Oil Shopping Guide, which raises consumer awareness about the importance of making good choices when shopping by identifying products made from palm oil (Cheyenne Mountain Zoo, 2011). Currently, work is underway to coordinate all these efforts in a more strategic approach to reach a broader audience. The Web presence of the program is geared specifically toward teachers and students, in part to connect students in the USA with students in the countries where this issue is most critical and where these animals are found.

*Arctic Ambassador Centers.* Polar Bear International's (PBI) *Arctic Ambassador Centers* program includes 37 zoos and aquariums that provide leadership for carbon emission reduction in their communities, support research projects to help conserve wild polar bears, and play a key role in the PBI Sustainability Alliance, a frontline team helping save polar bears in a rapidly warming Arctic.

Through their research, stewardship, and education programs, the centers address the issues that are endangering polar bears, including sea ice loss due to global climate change and environmental impacts of industry (Mielson, 2007). PBI Arctic Ambassador Centers participate in programs that spread the word about polar bears and sea ice loss and inspire individual action.

*PBI Leadership Camps*, organized by the centers, are intended to motivate individuals who want to advocate, either personally or through their organization, for conservation and sustainable lifestyles. *Arctic Ambassador Centers* send staff and students to the leadership camps in the tundra near Churchill, Manitoba, to focus on polar bears, their arctic habitat, and what needs to and can be done to safeguard the well-being of polar bears and their habitat after these representatives return to their own centers (Polar Bears International, 2011a, 2011b).

PBI Tundra Connections broadcasts, sponsored by both PBI and the Ambassador Centers, provide opportunities to participate in exclusive Webcasts to meet and talk with leading scientists and educators. Video conference sessions are available for school groups, zoos, aquariums, green clubs, or business and community leaders. The content targets primary and secondary school and universities but easily adapts to general audiences. As an example, a Cleveland Metroparks Zoo keeper connected via distance learning to the zoo and discussed her experience at Leadership Camp. A week later, a communicator connected via distance learning from Leadership Camp to an elementary school in El Paso, Texas (Buchanan, 2007).

## **Resources to Support Zoo and Aquarium Sustainability Efforts**

Zoos and aquariums also rely on resources produced by other types of organizations to facilitate education for sustainability. One resource many zoos and aquariums have identified as being of great use for creating and supporting educational as well as operational programs focused on sustainability is *The Fostering Sustainability*

*Behavior Daily Digest* which has over 7,000 program subscribers (McKenzie-Mohr, 2011). The subscription includes books, articles, programs and case studies, journal articles, and a forum for questions and discussions.

An additional resource supporting zoo and aquarium professionals to work collaboratively on issues of sustainability is the AZA's Green Scientific Advisory Group (SAG). This group focuses on the technical issues related to the operations of AZA-accredited institutions and the development of resources that address the impact that each institution has on its local environment. They also provide a mechanism to coordinate expertise already in AZA, to centralize information, expedite communication, and identify resources both within AZA and outside the organization. Most recently, the Green SAG has been developing brief statements on key topics (e.g., waste, energy use, and purchasing) in order to frame priority areas. One specific area of focus is at the institutional level where zoos and aquariums work to raise awareness about their own institutional green practices and increasing employee/contractor/guest awareness about what they are doing in the green arena. The work of this group provides opportunities for zoo and aquarium educators to share real stories of sustainability efforts happening at their own institutions and connect this information to the education programming being offered to all guests, including school groups.

## Education for Sustainability in Zoos and Aquariums

The nature of zoos and aquariums is such that each museum has a different collection of fauna and flora. Some zoos and aquariums have collections focused on particular parts of the world (e.g., North America or Africa), while others offer broad collections across continents. Zoos more than aquariums, have, over time, presented the animal collections taxonomically, geographically, behaviorally, and thematically (Hanson, 2002). Although zoos and aquariums share many philosophies about animals, collections, and education, each institution has a unique personality, and its educational programs reflect that zoo's specific mission. A survey of zoo and aquarium education programs was conducted to explore the range of education for sustainability.<sup>1</sup> Seventy-eight of the 212 accredited zoos in the USA responded to the questionnaire. The data in this section refer to this exploratory study. We found the topics offered by zoos and aquariums are primarily designed and taught with or containing concepts of sustainability, even though they may not be viewed as ESD by the zoo or aquarium. The unique condition of having wild animals in a human-constructed facility creates the social and environmental

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<sup>1</sup>The online survey included six questions about outreach programs and on-site programs for pre-school; grades K-4, 5-8, 9-12, 13+; and intergenerational audiences. Item included check all that apply responses for common sustainability themes (e.g., recycling/reuse and biodiversity). The survey also queried teacher workshops. Open-ended responses were collected related to successful sustainability-related program and useful resources.

relationships necessary for ESD. Furthermore, the school-based topics in zoos and aquariums must address economical impacts of environmental action as that is relevant to the world of conservation.

Most of the zoos and aquariums in our study indicated that biodiversity is the dominant topic linked to sustainability across all ages and grades, from early childhood through university programming, in both outreach and on-site school efforts. Biodiversity is also the dominant message sustained across intact, intergenerational visitors (families). Even though this audience is not in “school,” the experiences created for these visitors including signage, animal encounters, shows, and interpretation programs are shared by school groups on field trips. Over half of all zoos and aquariums surveyed use biodiversity as a frame for sustainability for pre-K programming, and over 90% do so for middle-school and high-school programming.

The second most dominant conservation message identified by the zoos and aquariums in our survey is recycling or reusing. As with the topic of biodiversity, this is consistent in zoos and aquariums across all ages, grades, and on-site and outreach programs. However, for teacher workshops, biodiversity is equal to water conservation as the second most common topic. For other ages, grades, and contexts for zoo and aquarium school interactions, water conservation is the third most dominant topic.

Increasingly, zoos and aquariums are incorporating topics into their educational programs that are much more clearly aligned with ESD. Societal issues such as energy, transportation, carbon neutrality, and social capital are becoming common in zoo and aquarium programming and are likely to be conducted for school audiences. For most zoos and aquariums, on-site school programming, with the exception of pre-K programming, includes sustainability topics. Fewer than 5% of zoos and aquariums do not offer such programming. For outreach programs, far fewer zoos and aquariums offer sustainability topics, and over a third do not offer sustainability topics to college and university classes, reflecting the more specialized role of the animal science or animal behavior content the zoo or aquarium provides for higher education.

## **Challenges to Education for Sustainability in Zoos and Aquariums**

Education for sustainability faces several challenges in zoo and aquarium programming. With on-site school approaches, as well as in school programs, the biggest challenges include proximity to the message, agency to action, and immediacy of relevance to the individual.

*Proximity.* For zoos and aquariums, connecting the zoo or aquarium collection to the overarching principles of sustainability or to actions that promote sustainability in learners’ lives is often a challenge. Consider the Suitcase for Survival program and the Bushmeat programs. Both of these programs are central to the work of zoos and aquariums but poorly related to the daily lives or experiences of most of the

children in school programs or visitors to the institution. However, there have been successful efforts that relate distanced issues to life at “home.” One example, the *Seafood Watch* program from Monterey Bay Aquarium, has been adapted to regional and national lists maintained by the Aquarium and other national partners in the USA such as Audubon Society.

*Agency.* For zoos and aquariums, conservation actions desired as outcomes from their school programs must align with the conservation mission of the zoo or aquarium. The challenge for translating mission to visitor/student messages is that when an individual is asked to take action, or change a routine set of behaviors, the likelihood that the individual will actually take the action is affected by her or his ability to control the decision factors related to the action. This is known as *agency* (Heimlich & Ardoin, 2009). Children rarely have agency to make decisions on behaviors for a family due to a host of factors including cognitive development, position in family, or economics. Likewise, individuals in complex systems like schools or universities, zoos or aquariums, businesses, or social organizations often do not have agency to institute organizational change.

Although most desired outcomes for these institutions do relate to sustainability, some educational programs focus more heavily on environmental aspects of the issue, and indeed, in many cases with school programs, they must focus on the environmental science aspect of the issue. The social and the economic aspects of ESD are usually present but with less attention. A primary key to influencing change is providing and supporting a very specific action that the receiver of the information can actually undertake.

*Immediacy.* As with agency, immediacy is an important aspect for application of behavioral intentions that must be transferred to an individual’s life. Immediacy relates to relevance of the topic to the individual’s life and to the ability of the person to immediately apply the learning. Schools have long struggled with immediacy of information in the classic “why do I have to learn that?” complaint of a student for whom the information being learned has no perceived immediacy. For zoos and aquariums, challenges include transference of concern/interest for the often exotic animal to concern/interest in local wildlife. The challenge is to identify actions a child has agency to do at home, in the community, and at school to immediately apply what they learn.

## Conclusion

Although considerable success has been achieved in connecting school audiences with issues of sustainability, there are ample opportunities to add to these efforts with anticipated success in light of the fact that zoos and aquariums are such great “classrooms” for exploring and learning more about our natural world and the ways we can positively impact it.

The shared mission of animal conservation for zoos and aquariums is clearly grounded in the tenets of education for sustainable development even if the institutions do not necessarily label their school education programs as such. By focusing on anthropocentric causes of habitat loss, the educational programs are squarely placed in the social, environmental, and economic considerations necessary for ESD.

As zoos and aquariums move toward engagement in other environmental issues such as climate change, carbon footprint, and alternative energy sources, their engagement with carrying sustainability messages to schools can only increase.

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# Chapter 15

## Teaching Sustainability Through a 24/7 Residential Experiential Learning Experience

Ken Voorhis

### Great Smoky Mountains Institute at Tremont

A group of ten sixth graders are coming down the trail in Great Smoky Mountains National Park. They have just been involved in surveying a local stream and nearby terrestrial plot for salamanders. “I found a really huge *dusky*,” reports an enthusiastic student. After the *dusky* has been identified, measured, weighed, and its vital statistics recorded on a data sheet, it is carefully returned to the stream where it was found.

The students are from a public school that for the past 15 years has been bringing their students to Great Smoky Mountains Institute at Tremont (Tremont) for a 5-day residential environmental learning experience. The *dusky* is one of the more common salamanders (of the genus *Desmognathus*) found in Great Smoky Mountains National Park. The Great Smoky Mountains rise between Tennessee and North Carolina in the southeastern USA. The “Smokies” are part of the Appalachian Mountains.

The students are involved in a Citizen Science project that Tremont has been conducting since the late 1990s. Tremont is not a research institution but conducts research because it is a “great way to engage students and involve them in the field, contributing real data to a study that can help the National Park and other scientists learn more about an important part of the systems and interrelationships that are at work there,” says Paul Super, former Citizen Science Director at Tremont and now a Research Coordinator with the National Park Service:

several studies in other parks have shown that well designed citizen science programs serve two important functions: educating and engaging the nonprofessional in the importance of science and stewardship; and generating data that helps resource managers and scientists to better understand how the ecology of an area functions. Funding is always limited, so

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K. Voorhis (✉)  
Great Smoky Mountains Institute at Tremont, Townsend, TN, USA  
Great Smoky Mountains National Park, Gatlinburg, TN, USA  
e-mail: ken@gsmit.org



usually a park can only monitor a few representative ecosystem variables and stressors. Citizen science allows us to monitor other parts of the ecosystem that may not have risen to the very top of the list, but could be at least as important. A citizen scientist may be the first to notice a change in salamander populations or evidence of an introduced pathogen. They need to know how much we value their contributions. (P. Super, personal communication, April n.d., 2011)

Salamander monitoring is just one activity that the students will be involved in during their week at Tremont. In partnership with the school, Tremont teacher naturalists have created an interdisciplinary, curriculum-based program that involves the students and teachers with in-depth and hands-on experiences that engage them with the national park during their stay. The teachers, along with some parent helpers, supervise the students in the dormitory each night but also help lead lessons in the field. Teachers, students, and Tremont staff are engaged in a 24/7 learning experience that utilizes the national park as their classroom and seeks to apply learning objectives throughout the experience as well as before and after their stay.

Some lessons at Tremont teach cultural history. One example is a living history program where students learn about life before the park was created by meeting Mrs. Davis, one of the park founders, and hearing of her vision to create a national park in the Southern Appalachians. The students then head into the mountains to learn about what the local people think of the national park idea. Along a short hike, students meet Tremont staff who are in period dress and playing the role of those whose land is now the national park. Students develop empathy for these people and begin to understand how people of the mountains lived and felt about their land. Students learn about the sacrifices that were made to create the national park and struggle with questions about how to preserve land that belongs to others. Instead of telling students why national parks are needed, students form their own ideas as they debate with the characters they meet about what preserving land will mean for future generations.

This is one example of lessons that can be better taught in the immersive experience that a residential program can provide. Other lessons may emphasize language arts, critical thinking skills, physical education, team building, or natural history. The mix of what is accomplished with any group is adapted to the grade-level curriculum needs and learning objectives of the classroom teachers. Teachers choose appropriate activities and work with staff to design a program that best meets their objectives. Specific program objectives are then communicated to teacher naturalists so that those objectives can be emphasized during their stay.

Tremont's stated mission is:

to provide in-depth experiences through educational programs that celebrate ecological and cultural diversity, foster stewardship, and nurture appreciation of Great Smoky Mountains National Park. The simplified version is ... connecting people and nature. Our world and society is becoming further detached from real experiences, real places and recognition and appreciation for our connections to those places, the land, the ecology, nature, creation, the earth itself. We provide opportunities – a bridge – for rediscovering, enjoying and exploring, reconnecting with all of this and in the process enrich people's lives and make them more capable of living lightly and in harmony with the place where they live. ([Great Smoky Mountains Institute at Tremont \[GSMIT\]](#), n.d., para. 1)

There are three strands that are woven throughout Tremont's programs in the context of using Great Smoky Mountains National Park as the classroom for accomplishing

these objectives. The three strands are diversity, sense of place, and stewardship. The major understandings for each of these themes are listed at the beginning of each of the following sections.

## *Diversity*

- Tremendous biodiversity exists within Great Smoky Mountains National Park.
- The Smokies are and have been affected by people of diverse interests and perspectives.
- We can learn much about ourselves by living in a community with people of diverse backgrounds, philosophies, and cultures.
- Diversity within plant, animal, and human communities makes them strong.

There could be few better places to study and celebrate biological diversity than within Great Smoky Mountains National Park. Within its boundaries exist elevations from 800 ft (245 m) to nearly 7,000 ft (2,130 m) and ancient mountains that have been folded, twisted, eroded, and weathered over long periods of time and extremes in weather. Beyond the reach of glaciers, the Smokies became a haven for species as they were pushed southward during the Ice Age. Northern species climbed to high elevations and remained as the climate warmed. The Smokies has over 1,500 species of plants, 30 salamanders, and—with an all species inventory in progress—900 species of moths, the list goes on. Developing an appreciation for the diversity of life is part of the educational focus.

There are still other lessons in diversity learned through living in community for several days. The experience of learning about each other's differences, the value of varied perspectives, and cultural character are an important part of the residential experience at Tremont.

A further look at diversity is gained from considering how people have lived in these mountains and related to the land over time. Some practices, like the logging that pressed people to preserve the Smokies as a park, reflected an attitude of everlasting abundance and even a disregard of natural systems as settlers sought to conquer the wilderness. Still, the way in which people relied upon and lived from the land is in many ways much more sustainable than the way that we live today. Many who resided in the mountains lived a life of subsistence, not by choice but by necessity. Their examples of use and reuse can guide us as we retreat from wasteful ways that affluence has brought.

## *Sense of Place*

- Great Smoky Mountains National Park is a unique and inspiring place.
- Getting to know a place helps us to appreciate it and that should lead us to want to care for it.

- Wild places like the Smokies are important to the health of our planet.
- Individually and as a whole, people are a part of the web of life, affecting and being affected by other living things.
- Each of us is a part of our “home” ecosystem. These “sense of place” attitudes should be transferred to our home ecosystem.

In today’s fast paced, globally mobile, technology enhanced world, “Sense of Place” may be one of the most important realizations that we can seek to develop and maintain within ourselves and others. Sense of place allows one to not only know and understand the individual components of a place but also to see the relationships of those components to one another and how they fit into that bigger picture. In his book *Crossing Open Ground* Barry Lopez writes, “*One learns a landscape finally not by knowing the name or identity of everything in it but by perceiving the relationships in it - like that between the sparrow and the twig*” (1989).

I think of those who have or had a great sense of place. I think of naturalists who were deeply tied to special places: Aldo Leopold, John Muir, Rachel Carson, Wallace Stegner (he wrote a book about sense of place), Wendell Berry, Annie Dillard, Ed Abbey, Joseph Wood Krutch, and Horace Kephart. These authors not only developed a great sense of place but were able to convey a part of that to others through their inspirational writings. Their words paint pictures of places and relationships. Their descriptions convey a feeling that they are telling us about old, old friends. They leave us too with a feeling of kinship to those places and a desire to develop those relationships further.

Our ancestors lived a life more closely tied to the land and a specific place. The “old-timers” seem to have a sense of place which has been derived from more than their years of experience. Nowadays people move from place to place frequently and travel great distances. We have also created a false idea that there are two worlds, a human-made one and a natural one and that one cannot exist within the other. Busier is better, and technologies that make the world smaller by bringing it in sound bites into our living rooms on TVs and computer screens, have made it harder for us to appreciate the simple miracles that are occurring in our own backyards.

Years ago a gathering of residential center directors was held at Yosemite Institute (YI). What a great opportunity to be in another National Park, a place with many different components than my home-place in the Smokies, and yet possessing an underlying similarity in its wildness. There the relationships within a Sequoia grove were less familiar to me, but as then YI Education Director, Pete Devine, led us among those huge trees and spoke softly about the role of fire in perpetuating those giants, my own sense of place said, “Yes, that Sequoias and fire are vitally linked makes sense.” The fire clears out undergrowth and causes cones to release thousands of tiny seeds. The seeds upon germinating cannot burrow through a deep layer of needles but finds a welcome hold in the thin soil after a burn. Many small trees grow up quickly but few survive to become giants.

A sense of how the past relates to the present is something each of us can nurture as well. The players in Yosemite are different from my home-place but the underlying pattern has a comfortable familiarity. One’s own sense of place can help in the appreciation of less familiar environs as well.

The Smokies is a place that provides a deep sense of place for many. Our participants leave feeling touched by the mountains. I have heard more than a few say that coming to these mountains is like coming home. A part of what draws us back to a place is familiarity, past experiences with senses expanded, curiosity piqued, and wonder at its height. “Wildness” seems to be a common denominator that evokes these kinds of feelings. That is not to say that sense of place can be found only in wilderness.

When participants leave our programs we want them to have more than a sense of place in the Smokies. We want them to recognize that having such a sense is possible, and needed, wherever we are. It is about having a sense of place upon this planet. It is being able to recognize the underlying similarities, intricacies and wonder wherever we are.

Joseph Wood Krutch once wrote, “...both Wordsworth and Thoreau knew that when the light of common day seemed no more than common, it was because of something lacking in them, not because of something lacking in it.” Wild places provide a powerful catalyst that draws us to them and gives us the insight to see common things as less so, so we invite people to our own special places to get their feet wet.

Knowing any place, is less a thing that one accomplishes and more something we live. A sense of place grows in a person over time, requiring patience, observation, research and in-depth experiences. It can be nurtured, developed, and enhanced but mostly it involves spending the time. I’ve found that when I take the time to get outdoors I am always rewarded. Rewards like the bobcat I saw last week, or a smell or sound that deepens my sense of place, or simply a feeling of belonging within the silence. Being rewarded in these ways, developing a sense of place, requires being open, getting out,...spending the time. (Voorhis, 1997, p. 1)<sup>1</sup>

## *Stewardship*

- We have a responsibility for preserving and caring for the Smokies and places like it.
- Preserving places like the Smokies means learning about its problems and working to resolve them.
- Our lifestyle and daily habits can be adjusted to have minimal impact upon the environment.
- Living in an earth-friendly way can be transferred from GSMIT to our lives at home.

Residential environmental learning centers provide great opportunities for demonstrating and modeling stewardship. Many centers have done an excellent job of building, retrofitting, and operating facilities with sustainable design principles in mind. For students to live in such a place has great potential in teaching them principles of stewardship. Understanding the systems that power, light, heat, cool, and sustain a facility can be aided by signage, displays, and demonstrations.

At Islandwood, a residential facility on Bainbridge Island in Puget Sound in the Pacific Northwest, students cannot avoid walking by the greenhouse that is the “living machine” that processes the center’s wastewater. When the students are guided by a naturalist inside the greenhouse, they do not expect to see beautiful plants and other organisms that are living off the wastewater purifying it. In the bathroom, they see a salmon sculpted into the sink near its drain and are reminded where the wastewater goes and that something has to be done to take care of it. Every surface is made of a different recycled material, illustrating practical and attractive ways to reuse everyday disposables and reduce what has to go to the landfill.

The food service at a residential center is a challenging but wonderful place to demonstrate stewardship. When possible, the food service at GSMIT uses local and organic foods. “So what?” one of the teacher naturalists might ask. Drawing students’ attention to a US map after the meal, the teacher naturalist asks the students about different food items that they have just consumed. Where does the sugar in our cookies come from? Much of our commercial sugar is grown in Hawaii, refined

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<sup>1</sup>Published with the kind permission of Ken Voorhis (1997). All rights reserved.

on the east coast of the United States, and then shipped to stores nationwide. What is involved in the production of that sugar? Land, labor, fertilizer, water, fuel, transportation, packaging, etc. The students get the point.

Are they going to stop eating sugar? That is doubtful and not the goal. Thinking about our choices, though, is the point. Students are asked to carefully consider what and how much they choose to put on their plates. At the end of the meal, food waste left on plates is weighed, and students are encouraged to try to leave as little as possible. Many schools take the challenge seriously and work to have zero waste at every meal. If they succeed, their school name is posted on our “zero food waste hall of fame.” Schools that try, but do not make zero for every meal, may be listed on the top five list of near zero waste schools. With all groups, we seek to encourage improvement, to think about the choices they make, and to challenge them to consider those choices once they return home. Reports from parents and teachers often indicate that this lesson really carries over as the students bring up the ideas of food waste at home and at school.

## **The Value of Wild Places**

What an amazing opportunity to operate a residential environmental learning center within the bounds of a National Park! Still, there are less than a dozen such places in the United States. Yosemite, North Cascades, Olympic, Delaware Water Gap, Cuyahoga, Indiana Dunes, Grand Teton, Yellowstone, Everglades, and Great Smoky Mountains are able to share their stories through such programs.

The chance for students to retreat to a setting like a National Park provides endless opportunities for learning. The last thing that GSMIT staff wants students to come away with is a perspective that nature is only found in these wild places but not at home. While these wild places provide opportunities to see nature in a more raw form, where the influence of humans has been less, human impact is still felt. Students observe the impact of people over time; in many cases, they perceive the very reasons that these places have been preserved.

Air pollution, exotic species, and climate change are often observed more readily in these seemingly pristine places. By observing natural systems up close and personal, the perceptive student will be able to see those same systems at work in their home environs. In experiencing and learning about the dependence of one organism upon the many other organisms and systems that surround it, students can better understand the connections that they have to natural communities both in terms of their own needs and the impacts that result from their personal decisions and actions.

The National Park service mission is a balancing act between “preservation” of special places and their “use” today and for future generations. This balancing act is the same conundrum that is faced in trying to live sustainably. We need things: food, water, clean air, shelter, and joy. But how do we obtain these things without damaging the very life systems that provide the things to meet these needs? National Parks provide numerous examples of efforts by managers to understand sustainability and

maintain these places by honoring both preservation and use. There have been both successes and failures, wonderful lessons as we look to what living sustainably means in today's world.

Special Program Director, Jeremy Lloyd, writes of another element that the National Park experience can provide:

Here at Tremont I have witnessed the kind of deep contemplation on people's faces that you don't see at the mall, or the post office, or in the workplace. I've seen it in people sitting by the banks of the Middle Prong, as they finish the solo hike during a wilderness trek, or as they gaze into the dying embers of a campfire at day's end.

Opportunities to "get outside yourself" simply to think and feel do not occur easily in our daily routine. That's one reason people come to Tremont, because for a short time at least, every person who comes here gets to be like Henry David Thoreau with time to explore their very own personal Walden Pond.

National parks also offer experiences minus a "middle man." In a wild landscape such as the Smokies, no one is reading a script or maneuvering levers behind a curtain. Instead it's a real life adventure.

The fact is, most people who visit the Smokies come not because of the natural scenery but because of the wide variety of attractive activities the surrounding area offers—all of them mediated experiences. But in order to experience something more authentic, you must visit the national park.

Climbing a mountain, catching a salamander, watching a snake slither across the trail, carrying a backpack full of a week's worth of supplies—these are just a few experiences that happen on a regular basis at Tremont, all of them unmediated. It only appears on the surface that teacher/naturalists are controlling them. Rather, they act as midwives helping to bring them into being. And that's in part what going to a national park means: giving up some control and being open to having an experience that is visceral, hands-on, and self-directed. (Lloyd, 2011, p. 3)

## Evaluation: Measuring Our Impact

Those involved in environmental education (EE)—both educators working in the field and classroom teachers who involve their students in EE programs—know how valuable a residential EE experience can be. Inquiry based, experiential learning can have a dramatic impact on students—not just their knowledge of the environment and environmental issues, but also their attitudes towards and understanding of nature and their own place in it. These positive benefits, while readily apparent, have historically been hard to quantify.

Our goal in conducting this evaluation project was to measure our residential program's influence on participants' environmental awareness, attitudes, and behaviors. This information helped us improve our own programming and support teachers' and administrators' involvement in experiential education programs. This evaluation project also allowed us to measure the value of a residential EE experience for school program participants, giving us scientific data to support the positive benefits we (and others) have observed for years.

While many previous evaluation studies looked at programs for relatively brief periods of time—weeks or months—Tremont's evaluation process, made possible with funding from the Alcoa Foundation, is long-term and ongoing. In 2005, Tremont staff began conducting surveys with nearly every school group attending a Tremont program. A study of this magnitude—conducted over several school years, with students from all over the country and from a great diversity of socio-economic backgrounds—gives us a more accurate picture of the effectiveness of our programs.

A random sample of students from each school group was administered a survey immediately upon arrival on campus. The same sample of students took another survey just before departing for home. We refer to these as the pre-trip and post-trip surveys. Our survey also followed students beyond their trip to Tremont, back to their home classroom. Three months following the trip, students and teachers completed a third survey to examine how their knowledge and attitudes may have changed in the intervening months. (Martin & Davis, 2008, p. 4)

## *Attitudinal Indices*

Measuring specific outcomes is relatively easy—ask a student the definition of a vocabulary word before and after a lesson, and see what he/she has learned. Trying to measure values or attitudes such as “sense of place and connection with nature” is considerably harder.

To address these difficulties, Tremont staff, in conjunction with Great Smoky Mountains National Park (GSMNP) staff and a professional evaluation team,<sup>2</sup> developed a system of “indices.” Each index consists of a series of related questions, designed to reveal a student’s changing attitudes towards certain concepts and ideas—concepts that cannot be addressed in a single, simple question.

Our indices were developed to reflect and measure the core values of our mission statement, as well as to measure other important impacts of our program, such as interest in learning and discovery. (Martin & Davis, 2008, p. 5)

The four measured indices are:

- Connection with nature,
- Environmental stewardship (stewardship),
- Interest in learning and discovery (discovery), and
- Knowledge and awareness of GSMNP and biological diversity (awareness).

As shown in Fig. 15.1, impacts were clear. Every index measured showed statistically significant gains between the pre- and post-Tremont trip surveys. The figure shows responses before the program, immediately following, and then 3 months after.

Our results showed a significant increase in all of our measured indices. Students leave Tremont with an enhanced understanding of GSMNP, a heightened interest in learning, a deeper feeling of connection with nature, and a greater willingness to act as good stewards of the environment (Martin & Davis, 2008):

One of the most significant features of the evaluation process was the 3-month survey. This allowed us to follow up with the students after several months away from Tremont to measure changes in their attitudes and perceptions. Previous studies evaluating the effectiveness of EE programs show inconclusive results regarding retention of attitudes and knowledge after a period of time. However, Tremont’s study shows that many of our indices and individual questions remain significantly higher. (Martin & Davis, 2008, p. 11)

Three-month follow-up surveys reveal that increases in students’ commitment to environmental stewardship, as well as knowledge and awareness of GSMNP and biological

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<sup>2</sup>For a more complete report of the evaluation process, see Stern, Powell, and Ardoin (2008).



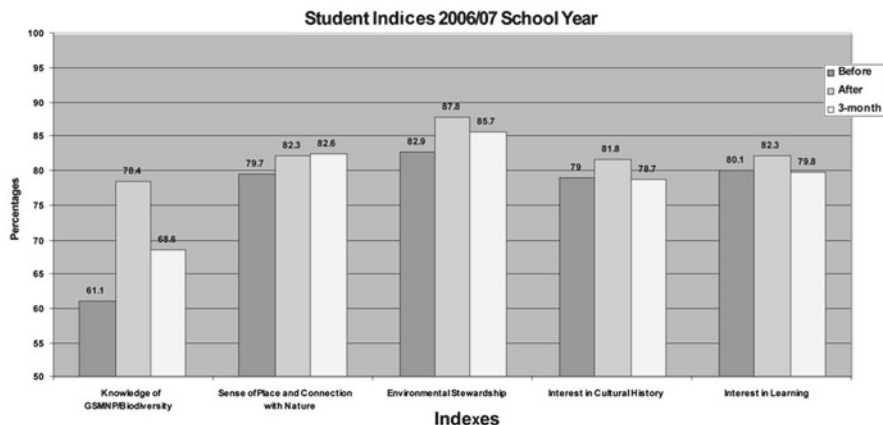


Fig. 15.1 Student responses by measured indices

diversity, remain significantly higher. Students continue to express significantly increased levels of comfort in the outdoors, as well as a higher level of attention to plants and animals in the surrounding environment. (Martin & Davis, 2008, p.11)

The results also showed “students retained knowledge of the diversity of plants and animals in GSMNP, and the cultural history of the area.... Students continued to show increases in their willingness to conserve resources (not wasting food, water, or electricity)” (Martin & Davis, 2008, p.11).

## Is It Worth It?

We are proud of the outcomes that our evaluative studies have demonstrated, however questions still arise; do these programs really make a difference? Does spending a few days or even hours in the woods listening, looking, feeling, and smelling with a group of students really change anything? Is the planet better off because someone spent some time in one of our programs as a workshop participant? Is it really worth the effort?

I imagine that just about everyone who has worked in this field for any length of time asks these or similar questions at some point. I have on more than one occasion been confronted with one of our teacher naturalists asking in one way or another, “Do I really make a difference?” Sitting back and contemplating the questions once again, while realizing that I would not still be at it if I believed any differently, I always come around to the same reply. Yes, you make a difference. It is worth the effort, and you are not alone.

I usually come back to the idea that we are planting seeds. The seeds that we plant have great potential but require continued care and nourishment. Some seeds have not yet sprouted and need the fertile soil of opportunities that will help them develop wonder in the intricacies of a creation of which they are a part. Some are already well-rooted in wonder and appreciation and need to be nurtured by experiences and knowledge that will cause those roots to go deeper, seeking answers and solutions along the way. Others have experienced drought and need to be refreshed and re-charged by returning to a place where they can drink in the wonder once again.



One might observe that the gardener who plants seeds but does not see them bear fruit will become weary. This may be the point at which the “Do I make a difference?” questions come about. Since our outdoor education encounters with people are brief, it is difficult to know if the small seeds that we have planted have taken root or not. In some cases our short time may be one of few such encounters that an individual may have. The gardener too cannot foresee which seeds will produce fruit and which will rot or be eaten by the birds. The gardener does know, however, that if s/he stops planting seeds, there will not be a harvest.

We often have a sharing circle at the end of a program where participants have an opportunity to share something that was meaningful to them during their experience with us. After these sessions, our naturalists will often share that a child that they had perceived as disengaged had given a startling testimonial as to the impact that the week had upon them. The sharing sessions that we have at the end of our adult sessions such as Elderhostel, naturalist programs, or teacher workshops are equally surprising as participants share insights, and impressions that have had significant impacts upon their lives. These, along with the daily discoveries and joys, are signs of growth that are certainly encouraging. Of the long-lasting effects that participants have once they have departed, we receive only glimpses.

The longer one is involved in our work, the more glimpses come to view, and the confidence in the importance of planting seeds becomes more certain. Those glimpses come in the form of letters from appreciative teachers and students, encounters with community leaders who have attended our programs as a child, friends who return again and again with students or to attend a special workshop, and stories of students whose experience affected their choice of career or those who have been motivated to do something to care for the Earth.

Our supporters, donors, board members, and others want to know if what we do is worth it and we are just beginning to do the research and statistical analysis to show those impacts and provide evidence that it is. It is important along the way that we do not assume that the impacts are as significant as we may think and be willing to change to make them so. At the same time we need to trust the intuition that we have developed through years of experience in doing what we do.

In interviews with nature center managers, I asked how they knew they were having an impact. The immediate comments received were things like, “You can see it in their eyes.” or “You know when you’ve made an impact on someone.” or “Because they keep coming back for more.” I trust that as we do the necessary work to determine our impacts that we also view it as “ground-truthing” what we intuitively know is powerful. We should also remember the quote, which is attributed both to sociologist William Bruce Cameron and Albert Einstein, “Not everything that counts can be counted and not everything that can be counted counts.”

Each of us can trace our love for nature to some early experience where the seeds were planted. Mine began with parents who took me camping, Scouts, and then an opportunity to work at a natural history museum while in high school. There were people in my life and yours (i.e., the reader’s), who were planting seeds. Some of those people were probably wondering if it was really worth it. There were really many seeds and many opportunities to nourish them along the way. Those who planted them were not alone.

Rachel Carson (1956) wrote, “Children need the companionship of an adult who can share their sense of wonder, rediscovering the joy, excitement and mystery of the world we live in.... It is not half so important to know as to feel. If facts are the seeds that later produce knowledge and wisdom then the emotions and the impressions of the senses are the fertile soils in which the seed must grow.” (p. 42)

Many of us are testimonies to those who planted seeds or exposed us to fertile soils and nourishment. Is it worth it? Is the planet better off? As for me, changing the world all at once is too big a job. But planting a seed? It needs to be done carefully, but it is easy when you enjoy it. I am not the only one who will care for that seed, its potential reaching far beyond my lifetime. We will only reap what we sow. (Voorhis, 1992, p. 1)<sup>3</sup>

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<sup>3</sup>Published with the kind permission of Ken Voorhis (1997). All rights reserved.

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## Chapter 16

# Toronto and Region Conservation Authority: Advancing the Sustainability Agenda

Nancy Lynn McGee

For almost 60 years, teachers and their students have been exploring the environment beyond their classroom walls with the Toronto and Region Conservation Authority (TRCA). One might ask, *why?* *Why* would over 180,000 students and their teachers participate in residential excursions, day trips, and in-class visits with TRCA yearly? It is not an easy question to answer, as like so many aspects of the natural world, the answers are embedded within multiple systems. It may be the excitement and freedom one feels while exploring or the sense of calm one experiences when the classrooms are left behind. It may be the draw of the seemingly endless green space so close to urban homes, or the enthusiasm of passionate educators wanting to share their knowledge about the world beyond our indoor habitats, and even beyond our present day. Or it just may be the way we teach, where we teach, and how we teach.

### Embedded in Our Past, Inspired by the Future

The Toronto and Region Conservation Authority (TRCA) deeply values educating the Greater Toronto Area (GTA) citizenry about the human and natural heritage of the region. Without question, sharing this knowledge is vital to achieving its present-day vision of a sustainable bioregion. However, to gain a full appreciation of TRCA's current approach to sustainable development through education, one must reflect upon this organization's origins and early history.

Dr. Arthur H. Richardson (1974), director of the Ontario Department of Planning and Development between 1944 and 1961, describes the conservation

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N.L. McGee (✉)

Toronto and Region Conservation Authority, Toronto, ON, Canada  
e-mail: nmcgee@trca.on.ca

movement in Ontario as beginning with the people. Naturalist clubs, comprised of both recreational and professional environmentalists, and organizations, such as the *Federation of Ontario Naturalists* and the *Ontario Conservation and Reforestation Association*, were particularly active in the 1930s, expressing the need for both conservation and preservation of the natural environment (Richardson). In 1944, political action reflected the importance of conservation to the citizenry, as the newly formed provincial Ministry of Planning and Development opened a branch dedicated to conservation, and Dr. Richardson was named its first director. This action was followed by the passing of the provincial Conservation Authorities Act in 1946 and the establishment of Ontario's first two conservation authorities (CAs), the Ausable and the Etobicoke CAs (Richardson), the latter being one of four conservation authorities which united to become today's TRCA.

The single most influential event in the shaping of today's CAs was undoubtedly the weather phenomenon known as *Hurricane Hazel*. On October 15, 1954:

...the Toronto area [was] hammered with rain from the hurricane that had decimated Haiti and left a swath of damage along the eastern coast of the United States. By morning at least 81 people were washed away to their deaths, several thousands were homeless, and the storm left \$25 million worth of damage—\$180 million in today's dollars. (Murray, 2004, pp. 8–12)

Though there may have been thoughtfulness in the planning of how land should be developed in the GTA, there was little anticipation of a storm like Hazel or the consequent devastation. Charles Sauriol, noted conservationist, captured the sentiment of the aftermath: “nature simply took her revenge” (1991, p. 7). Hurricane Hazel displayed the power of nature to the GTA and reminded all that people must find a relationship based on nature's balance and stewardship, not domination. By 1957, the lessons of Hurricane Hazel had created the political will necessary for the passage of legislation to create the Metropolitan Toronto and Region Conservation Authority (MTRCA). Today, MTRCA is known simply as the *Toronto and Region Conservation Authority*.

As with all conservation authorities in Ontario, TRCA's jurisdiction is dictated by watershed boundaries rather than political boundaries. It is a provincial government agency (*a body corporate*) established in accordance with the Conservation Authorities Act of 1946 (Richardson, 1974). TRCA's objectives are to establish and undertake a program which furthers conservation, restoration, development, and the management efforts of natural resources. It does this through partnerships with municipalities, the province, and additional stakeholders at the local community level.

TRCA's boundaries encompass 3,467 km<sup>2</sup>, including nine watersheds, namely, Etobicoke Creek, Mimico Creek, Humber River, Don River, Rouge River, Duffins Creek, Petticoat Creek, Carruthers Creek, and Highland Creek, as well as the Lake Ontario shoreline. Its sphere of influence also extends to Lake Ontario. The TRCA encompasses six municipalities, namely, the city of Toronto; the regional municipalities of Durham, Peel, and York; the township of Adjala-Tosorontio; and the town of Mono.

Though the role of “mitigate[ing] the damage that any future Hazels could cause” (Hall, 2004, p. 41) may be one of the more notable functions of TRCA, it rests beside many other important roles of equal value, such as:

- Monitoring water quality and health aquatic ecosystems.
- Restoring land and water interfaces.
- Evaluating the condition of terrestrial flora and fauna.
- Issuing development permits.
- Ensuring compliance with established regulations and policy.
- Providing archaeological expertise.
- Encouraging and providing stewardship opportunities.
- Acquiring land.
- Educating an active citizenry.

This list is by no means exhaustive, but it does capture a few ways in which TRCA ensures both the conservation and protection of the vibrant urban and rural ecosystems of the GTA. Among these many important roles played by TRCA, Bill McLean, former chief administrative officer of TRCA, stated that “education programs have had the greatest and most lasting impact on the community” (2004, p. 151).

Today, TRCA’s educators strive to maintain the quality of programming deserving of the high praise offered by Bill McLean’s words, as well as the expectations of TRCA’s contemporary vision: “The quality of life on Earth is being determined in rapidly expanding city regions. Our vision is for a new kind of community, The Living City, where human settlement can flourish forever as part of nature’s beauty and diversity” (Toronto and Region Conservation, 2003).

## **Shifting from Environmental Education to Education for Sustainable Living**

As can be seen in Table 16.1, TRCA has amassed almost 60 years of teaching about the natural environment and people’s relationship with it. In this time, it has accumulated a spectrum of educational programs as diverse as the ecosystems and communities which TRCA serves. Education staff have always valued an ethos of conservation, preservation, restoration, and stewardship and have taken great pride in how their lessons complemented and supported the formal and informal education systems of our communities, particularly in the areas of environmental and heritage education.

However, with rapid urbanization literally at the world’s doorstep, it became critical that TRCA reevaluates its education philosophy to ensure that the contemporary concerns also were being addressed. The Worldwatch Institute indicated that “in 1990, only 160 million people, one tenth of the world’s population, were urbanites [and that] by 2006, in contrast, half the world (3.2 billion people) [would] live

**Table 16.1** Milestones of TRCA's education facilities and programs related to formal education

Date	Event
1953	Established first camp school (Humber Valley Authority) in partnership with Toronto school (York Memorial)
1956	Opening of Dalziel Pioneer Park (first agricultural museum in Canada)
1960	Opening of Black Creek Pioneer Village (formerly Dalziel Pioneer Park)
1963	Establishment of the Albion Hills Field Centre
1968	Opening of the Cold Creek Conservation Field Centre (closed in 1992)
1970	Opening of the Claremont Field Centre
1973	Partnership between York University and MTRCA to deliver summer credit course in environmental studies (until 1996)
1974	Opening of the Boyd Conservation Field Centre (closed in 2001)
1975	Boyd Archaeology Summer Credit Course
1978	Albion Hills Demonstration Farm is overhauled as a unique opportunity to visit a working dairy farm (closed in 2007)
1979	Kortright Centre for Conservation opens, designed to meet the growing need for more conservation day centers
1980	Official opening of the Lake St. George Field Centre
1985	Environmental science summer credit offered at the Lake St. George Field Centre (until 2003)
1996	Husky Environmental Weeks begins at the Albion Hills Field Centre
1997	Watershed on Wheels, an outreach program from the Albion Hills Field Centre, begins taking environmental education to the school
2000	York Children's Water Festival is held for the first time at Bruce's Mill Conservation Area (partnership between the region of York and TRCA)
2001	Peel Water Festival finds permanent home at Heart Lake Conservation Area
2004	Investigating The Living City Spaces program is launched
2005	A Systems Thinking Curriculum for Learning in The Living City is adopted as the new policy document for education at TRCA, shifting the focus from environmental education to sustainability education
2006	All of TRCA's education facilities become certified EcoSchools, the first nonschool board facilities to achieve this distinction
2008	The Weston Family Environmental Leaders of Tomorrow program is launched, piloting TRCA's Integrated Learning Strategy
2011	Launch of the Ontario EcoCentres program

Note: Adapted from Web page, *Our History*, Toronto and Region Conservation Authority (TRCA, n.d.). Retrieved June 25, 2008, from [http://www.trca.on.ca/Website/TRCA/Website.nsf/WebPage/trca\\_learning\\_educationnew](http://www.trca.on.ca/Website/TRCA/Website.nsf/WebPage/trca_learning_educationnew)

in urban areas – a 20-fold increase in numbers” (1999). Closer to home, it was published that Toronto and its surrounding communities required a footprint of land approximately one third the size of Ontario (Onisto, Krause, & Wackernagel, 1998) to sustain its population. With population increase, consumption, and emission of greenhouse gases increasing at a threatening rate, TRCA had impetus to reevaluate its education strategy to be able to address these concerns:

If we are going to involve ourselves in the work of change, [*sic*] then we must begin at the level of our paradigm, our shared vision, our worldview, because these ways of thinking run so deep that they form values, and therefore our behaviour and our culture....To effectively

engage people in learning about The Living City and how this connects to being sustainable, the TRCA needs a way to frame learning in a holistic, non-linear, and temporal context which both includes and goes beyond what we are doing today. (Toronto and Region Conservation Authority, 2005)

In 2003, TRCA decided to develop an up-to-date education policy document, which would refocus efforts towards achieving sustainability in the GTA citizenry. The work of change began.

TRCA's *Systems Thinking Curriculum* was developed through the lens of The Living City vision. The curriculum has roots in two works: *Teaching and Learning for a Sustainable Future: A multimedia teacher education programme* (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2002), and *Environmental Literacy: Providing a Systems Approach to Environmental Education in Minnesota* (Minnesota Office of Environmental Assistance [MOEA], 2002), a systems thinking framework from within the Minnesota Office of Environmental Assistance scope and sequence document. TRCA's curriculum draws from the ideas within these works, as well as that of multiple intelligences theory (Gardner, 1993). Iterations of work completed by Ontario EcoSchools (early 2000) on systems thinking and the Ontario school curricula also were influential. In 2005, *A Systems Thinking Curriculum for Learning in The Living City* debuted, explicitly stating TRCA Education's tenet that learning should be:

- Locally based: designed for or by a particular population with their specific geographical, social, economic, and physical needs in mind: "grassroots."
- Relevant to the learner: personal meaning is powerful....
- Experiential: when engaged in learning programs, people retain about 10% of what they read, 15% of what they hear, but 80% of what they do.
- Lifelong: the joy of learning does not end with graduation, but continues throughout a person's personal and professional life (Education Program Services, TRCA, n.d.).

In 2011, the TRCA added:

- Action-outcome based: learning with purpose, where people are enabled to move forward independently, changing their own behaviors and inspiring others to live more sustainable lifestyles.
- With these explicit guidelines for program development and delivery, TRCA education began writing a new chapter in its story, that of sustainable development.

## **TRCA Facilities and Programs Serving Formal Education**

One of the greatest assets that TRCA is able to offer the K-12 students of our watersheds is natural space—spaces to learn, spaces to explore, and spaces to experience the flora and fauna of our region. TRCA recognized many years ago that it is desirable for many reasons to accommodate both the students' need to explore and

learn about their world firsthand and the students' need for safety and guidance in learning. To that end, TRCA developed both facilities and programs that have been educating students of all ages about our history and our outdoor world.

The opening of TRCA facilities and the emergence of environmental and sustainability education programs are listed in Table 16.1. However, to appreciate how they support the formal education system, the following categorization may be helpful: residential field center excursions, day center visits, in-class programming, and special events and festivals. Programs are explicitly linked to TRCA's *Systems Thinking Curriculum* and to the Ontario Ministry of Education curricula. Collectively, the TRCA programs feature diversity and accessibility.

### ***Residential Facilities***

The residential facilities include the Albion Hills, Claremont, and Lake St. George field centers. These facilities were built with the intention of hosting students and their teachers from the GTA school boards on overnight excursions; however, these residential facilities have hosted students from all over the world. The range of grade levels participating in these residential opportunities lies predominantly in the "grade six and over" category, but staff have been delighted to welcome primary-, junior-, intermediate-, and senior-level students through their doors. Lessons are between 90 and 150 min in length and are offered in the morning, afternoon, and evening. All meals, accommodation, program supplies, and expert teachers who are certified by the Ontario College of Teachers are included in the fee for the field trip.

For a typical 2.5 day visit, teachers preselect six programs from a list of over 30 to meet the specific learning objectives for the visiting class. Programs range from academic-based, such as *Stream Study*, *Environmental Impact Assessments*, and *Animal Ecology*, to more leadership and recreational in nature, such as *Orienteering*, *Cross-country Skiing*, *Survival Skills*, and *Group Dynamics*. Some visits, such as *The Weston Family Environmental Leaders of Tomorrow Program*, feature a partial syllabus in which up to three programs are predetermined by TRCA staff, allowing for an integrated flow of ideas from one lesson to the next. Programs such as this one are designed to both layer and intensify specific learning objectives, with the goal of enabling student success in the thematic areas of environmental leadership, ecological literacy, and community action.

Each of the three residential sites provides a range of programs that are similar to their sister sites, as well as unique lessons designed for the characteristics of their location. An example of one such specialization is the lake ecology program offered at the Lake St. George Field Centre, where students board a solar-powered, electric pontoon boat to conduct physical and chemical analyses of the lake. Another highly specialized residential program is the Boyd Archaeological Field School, a senior-level high school program that carries credit to meet graduation requirements. This Field School has been offered for 34 years by TRCA's archaeology department and focuses not only on the archaeology and history of Ontario but also on contemporary



aboriginal issues. The Field School encourages an appreciation of, and advocacy for, cultural heritage and a broader understanding of the collective history of the people who live in the region.

TRCA's residential field centers contribute to the formal education goal of fostering a sustainable citizenry in a variety of ways. Visiting teachers have remarked that multiple objectives are met during these excursions:

- Socially, students are given the opportunity to bond as a community, as well as develop cooperative and leadership skills.
- Cognitively, students' sense of wonder is ignited by novel experiences, deepening previous classroom lessons and unveiling queries for later analysis.
- Pedagogically, students experience hands-on activities, creating greater relevance and local connections with the day's lesson.
- Affectively, students relate to the natural environment on emotional and sensory levels, experiencing the excitement of first-time encounters, and the freedom to roam.

One of the most common reasons given by teachers for visiting the residential field centers is that it allows students to be immersed in sustainable living practices. A full program (150 min) at each center is dedicated to helping students understand the concept of ecological footprints and how to reduce their impacts on the planet. Through thoughtful behavior changes in areas such as water conservation, waste minimization and diversion, and selection of healthy, earth-friendly food options, students begin to see and feel their ability to make a difference. TRCA staff realize that habits can be difficult to break or build in just a few days. However, by giving students the opportunity to recognize and reflect upon the impacts of daily lifestyle choices, they can choose their own future course of action.

## *Day Facilities*

TRCA day centers include the Kortright Centre for Conservation and Black Creek Pioneer Village. Each center has a unique blend of programming which spans both formal and informal education. Combined, these 2 day centers account for over 60% of the formal education participants to TRCA programs.

More than 60,000 students and their teachers visit the Kortright Centre each year for a combination of traditional environmental education and state-of-the-art sustainable technologies programming. As with the residential field centers, teachers preselect lessons from a suite of programs—more than 50 are offered. Kortright offers the largest number of demonstrations and education/training programs of green technologies and buildings in Canada. One of the most prominent examples is the 1.6-km *Power Trip Trail*, which focuses on sustainable energy. The trail includes a variety of working demonstrations focused on renewable energy organized around five technology themes: biomass, wind, solar/thermal, photovoltaics, and energy efficiency. Other green technology programs offered at the Kortright Centre include *Go Fly a Kite*, *Conservation of Energy*, *Photovoltaics*,

*Solar Heating*, and *Solar Cars*, each designed with student-centered learning and exploration in mind.

Specialists High Skills Majors (SHSM) are Ontario Ministry of Education programs that provide high school students with the opportunity to focus their high school diploma in a thematic fashion, gaining specialized certifications and experiences as part of their education. The Kortright Centre has developed specialized workshops and certifications in the area of sustainable technologies, creating highly advanced hands-on learning that supports the SHSM, postsecondary education, and job marketability.

The Kortright staff takes seriously the responsibility of ensuring that the lessons learned on-site are transferable to action at the school. One example of students taking their learning home is the “Great Canadian Solar Race,” a challenge where students design and build a solar-powered model car, and compete with other schools in their cars’ performance. Kortright also mentors schools in understanding the technological and funding components of the *Solar on Schools (SOS)* program, an initiative in which solar panels are installed on schools.

Black Creek Pioneer Village is the “eldest sibling” in TRCA’s education facilities family and, somewhat fittingly, is the anchor of historical and heritage learning at TRCA. It is representative of a nineteenth-century working village and includes over 40 buildings from across south central Ontario. With many costumed staff immersed in the activities of the day, Black Creek Pioneer Village literally brings the 1800s to life. Like the Kortright Centre, its doors are open to the public as well as to students and their teachers. Programs, such as *School Days*, *Life in a New Land*, *Cast Your Vote*, and *Waste Not Want Not*, illustrate the range of programming from which a teacher is able to preselect. Though typically lessons are offered within a half or full day visit, the *Dickson’s Hill School Program* offers a multiday immersion experience for students, attending school, performing chores, and learning the trades, crafts, and games of yesterday’s child.

At first, it may be difficult to imagine how Black Creek may be considered a center of sustainable learning. However, in strolling along the wooden boardwalks, it becomes apparent that it could easily embody the *heart* of sustainability education. Consider the students watching a period-costumed interpreter as she deftly bakes cookies and bread in the oven of a wood-fired stove, all the while explaining her family’s connectedness and dependence on the land for everything that sustains them. Watch the hands of students extend eagerly to grasp at fruits and vegetables fresh from the garden while a master horticulturist explains about the *original* local food movements. Listen to the water tumbling over the massive wheel at Roblin’s Mill, depicting effectively how the force of moving water can be used to grind grain into flour for the general store. Or simply look at how the town itself shows the interconnectedness of the shop owners, to the blacksmith, to the mill, to the schoolhouse, to the landowners, and beyond; it may be as close to a self-sustaining, human-centered system as one will see in the GTA.

Although Black Creek Pioneer Village was never intended to be a center of sustainable technology or practice – this was not just a discussion in a nineteenth-century settlement – it does convey the message that sustainability is more than just nature studies and learning about environmentally friendly products. Through Black

Creek, one better understands how heritage plays a prominent role in the formation of culture: culture shapes thinking, and thinking shapes actions.

### ***In-School Programs***

In-class visits are almost exclusively offered by the Watershed on Wheels (WOW) team. From Monday to Friday throughout the school year, WOW instructors drive the distinctive WOW vehicles to area schools, offering programs to students from K-12. On a typical day, four WOW staff will visit a total of eight classes at two different schools, delivering 2.5-h programs. There is great efficiency of travel, as well as a minimized eco-footprint when offering programs in this manner. It also means that in 1 day, the WOW team's lessons can be delivered to either multiple grade levels or multiple classes of the same grade level within a school. By engaging *multiple* grade levels, WOW staff can lay the groundwork for shifting the culture within that school; through the engagement of an *entire* grade level, curriculum objectives for the division can be achieved.

The unique qualities of the WOW program are numerous, but two features which make it particularly attractive to the formal education system are that it is offered *free of charge* to schools within Toronto, the region of Peel, and York Region, and it is offered in the community where students live. The WOW program offers a selection of 19 engaging lessons for indoor and outdoor environments. Topic areas covered include climate change, water conservation, eco-footprints, aquatic plants, and more. Two distinctive programs delivered by WOW within the GTA are the *Yellow Fish Road* and the *Aquatic Plants* programs.

The *Yellow Fish Road* program was developed in 1991 by Trout Unlimited and aims to “help Canadians understand that storm drains are the doorways to our rivers, lakes and streams” (Yellow Fish Road, 2003). In 2010, 1,959 students within the GTA painted 3,720 storm drains with the highly recognizable yellow fish and delivered 14,084 fish-shaped information brochures to area residents, enabling their communities to better understand the message of fresh water protection. The goal of the *Aquatic Plants Program* is to increase students' knowledge and awareness of the value of wetland ecosystems and the important roles and functions they play in maintaining the ecological health of our region. In 2010, nearly 5,000 students were able to plant almost 12,000 aquatic plants, some raised in their own classrooms. These participatory programs empower students and demonstrate that actions can make a difference.

### ***Community Events***

The *Living City Spaces* programs, festivals, and special events offer distinctive, phenomenon-inspired lessons, delivered primarily at TRCA Conservation Areas. Programs like *Winged Migration* have an ephemeral quality, being offered for a short

period in the spring and/or fall when bird migrations are at their peak. Students gain an understanding of the biomonitoring process and how the collection of data helps diagnose the health of an ecosystem. Water festivals are offered every spring at Heart Lake and Bruce's Mill Conservation Areas, providing junior-level students (grades 4–6) throughout the region of Peel and York Region with the opportunity to explore a variety of water-themed activities and presentations. Teachers and their classes may also participate in the self-guided program, *Knowing Nature, Staying Safer*, offered at the Bruce's Mill Conservation Area. As the diversity of TRCA's education programs suggests, staff have labored to provide sustainable learning experiences for K-12 students that are experiential in nature, create personal relevance, encourage participatory outcomes, and are accessible to all students of the GTA.

### ***College and University Programs***

TRCA has multiple programs and initiatives that extend to college and university classrooms. Postsecondary courses and workshops, such as the *Bioregional Planning Workshop* offered at York University, share the expertise of our professional staff, allowing real world projects to be the tools of teaching. Preservice and in-service teacher development is another area of focus for TRCA, offering workshops at professional conferences such as the Science Teachers Association of Ontario (STAO) and the Ontario Society of Environmental Educators (OSEE). Additionally, TRCA is the Canadian host for the *Monarch Teacher Network*, an internationally recognized teacher education program. By sharing knowledge and experience with colleagues in the classroom, TRCA increases the opportunities for students to hear the message of living sustainably, which further both the objectives of TRCA and the formal education system.

### **Partnerships**

Some of TRCA's most significant assets are their partners, donors, and sponsors. They provide in-kind contributions and advice, as well as inspiration. In fact, many of TRCA's education programs exist *due* to the creativity and generosity of its partners. They may have never heard Bill McLean's message, but believe that TRCA's education programs have great impact on community transformation.

With social equity as a central value, TRCA has created partnerships and funding programs with municipalities, private foundations, corporations, and individuals to provide financial support for students from priority communities. This has been done to ensure that all segments of the student population are able to participate in TRCA programs regardless of social or economic status, with specific targets of 20% of our residential field center programs spaces and 10% of our day program spaces reserved for these communities.

## Concluding Remarks

To return to the opening paragraphs of this chapter, the reason why teachers bring students to TRCA education facilities or invite the WOW team into their classrooms is that these academic experiences are entwined with the sensory, emotional, social, and personal growth experiences that come alongside the learning opportunities TRCA offers. These programs create scaffolding for lessons to be taught in the classroom and deepen learning previously gained. TRCA shares with the formal education system the responsibility for teaching important lessons of sustainability and considers it a privilege to be able to share the knowledge, experiences, and passion of all staff with the leaders of tomorrow.

**Acknowledgments** Capturing the essence of TRCA's education philosophy and praxis in one chapter is a daunting task. My thanks to the many individuals at TRCA who shared their words and energy to this chapter and offer their knowledge and passion to students every day.

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**Part VI**  
**Higher Education**

# Chapter 17

## Working with Institutions of Higher Education

Paul Rowland

### Introduction

Education for sustainable development (ESD) in both the USA and Canada is different from ESD in the rest of the world because of differences in historical context. In fact, most discussions about education for sustainable development in the USA are framed as “education for sustainability (EfS)” or “sustainability education.” The phrase, education for sustainable development, is relatively uncommon in US higher education discussions. The difference is, in part, a function of how sustainability became part of the discussion about the higher education curriculum. Many of the thought leaders in sustainability education have their roots in environmental education or environmental activism. As environmental studies grew to include an understanding of social issues, drawing from the science-technology-society movement and from the environmental justice movement, and environmental economics (or ecological economics) began to inform the understanding of environmental issues to include the economic and social dimensions of these issues, sustainability emerged as a unifying theme. The term “sustainability” captured the need for interdisciplinary study and integrated decision-making and thus provided the language for expanding the field beyond environmental studies. The emergence of a model of sustainability based on the image of a three-legged stool became increasingly popular as a way to describe the importance of framing sustainability through the lenses of the environment, economics, and social dynamics. Nonetheless, most US discussions of sustainability rest heavily on an environmental entry point that shapes the rest of the

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P. Rowland (✉)  
Association for the Advancement of Sustainability in Higher Education,  
Denver, CO 80202, USA  
e-mail: paul.rowland@aaashe.org



discussion.<sup>1</sup> This emphasis is coupled to campus operations where sustainability places a heavy emphasis on energy and water conservation, reduction of greenhouse gas emissions, and construction of green buildings. One consequence of this difference is that there are a number of environmental organizations that support and embrace sustainability, while there are few social justice organizations that are identified with the sustainability movement either on or off campuses. Furthermore, conversations about campus sustainability tend to avoid fundamental discussions about economic and social disparity as products of institutional decision-making.

Another area of difference in the way that US and Canadian higher education institutions have addressed ESD is the relatively high importance placed on campus operations as a part of ESD. International documents like the Bruntland Report and Agenda 21<sup>2</sup> called for higher education to broaden the scope of education to include cross-disciplinary coursework that develops understandings of integrated problem-solving that contribute to a sustainable future (Bruntland, 1987; United Nations Conference on Environment and Development [UNCED], 1992). These documents were silent with respect to campus operations, yet in the USA, there have been many campuses where sustainability is more prominent in operations than it is in curriculum.

Below we will explore how this environmental and operational orientation to campus sustainability shaped the movement and the major organization that has supported it, the Association for the Advancement of Sustainability in Higher Education (AASHE).

## The Emergence of AASHE

During the 1970s and 1980s, a number of institutions moved forward in establishing environmental science and environmental studies programs. Meanwhile, campus staff and administrators working in campus operations began to address issues of resources use, such efforts often driven by economic forces. Increases in energy prices encouraged energy managers to seek means for energy conservation. Water shortages and increasing costs led to water conservation both within buildings and in landscaping. Increased tipping fees for sending waste to landfills provided the needed justification for campuses to engage in recycling and other waste reduction efforts.

The introduction of the Talloires Declaration ([http://www.ulsf.org/programs\\_talloires\\_td.html](http://www.ulsf.org/programs_talloires_td.html)) by Jean Mayer of Tufts University in 1990 was an important turning point in the evolution of the campus-based sustainability movement in the

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<sup>1</sup> A clear exception to the environmental approach is that taken by Kelly who argues that sustainability developed as a critique of post-World War II development efforts and that fundamentally “sustainability is nothing less than applied moral and political philosophy” (Kelly, 2010).

<sup>2</sup> Agenda 21 emerged as a blueprint for sustainable development activities from the United Nations Conference on Environment and Development (UNCED). Chapter 36 of Agenda 21 describes the role of education in sustainable development.

USA and Canada. The declaration explicitly recognized the role of higher education in sustainability education, and signatories committed their institutions to ten actions, including fostering environmental literacy for all.

The Talloires Declaration was important because it explicitly linked ESD to campus operations in a section titled, “Practice Institutional Ecology” where signatories commit to setting an example of environmental responsibility (Calder & Clugston, 2002). Because it explicitly used the terms “sustainable development” and “global sustainability,” it created the opportunity for university leaders to commit their institutions to sustainability practices and simultaneously educate students on global sustainability. The Talloires Declaration gained popularity and authority in the USA and Canada throughout the 1990s. The original signatories included only four US university presidents (Tufts, Northern Iowa, Pittsburgh, and Wisconsin) and no Canadian institutional leaders; however, by 2010, there were 37 Canadian and 166 US institutions among the 350 total signatories ([University Leaders for a Sustainable Future \[ULSF\], n.d.](#)).

### *A Need for Leadership*

As awareness of sustainability issues grew during the 1990s, there emerged a new kind of activist: the campus sustainability advocate. These were personnel on campuses who were actively engaged in some campus sustainability activity such as teaching, energy conservation, planning, and waste diversion and who were proponents of increasing sustainability activities on the campus. The term includes everyone from students to presidents to faculty members to sustainability staff. These campus sustainability advocates began to look for ways to network and share resources and ideas.

In 1996, Ball State University held its first international Greening of the Campus (GOC) Conference to bring together campus sustainability advocates. More than 200 people attended, leading to the establishment of the Greening of the Campus Conference series that continued to grow through 2009. One very impressive aspect of this conference was the diversity of the participants and topics addressed. Presentations ranged from environmental literacy to bioregional stewardship to green building design (Koester, Elfin, & Vann, 2006).

Meanwhile, in the western USA, faculty development workshops were beginning at Northern Arizona University where the Ponderosa Project emerged as a model for developing and supporting academics who were interested in integrating sustainability into their courses and instruction. These workshops began in response to a challenge from Anthony Cortese of Second Nature for institutions of higher education (IHEs) to replicate what he had created as dean at Tufts University, the Tufts Environmental Literacy Institute. After several years, the Ponderosa Project had provided professional development to more than 100 faculty members (Chase & Rowland, 2004).

As the campus sustainability movement grew, there was a clear need for an organizational home for campus sustainability advocates and for the institutions that were making sustainability commitments. In 2001, a group of faculty, staff, and

administrators from a number of institutions in the western USA and Canada formed a networking organization: Education for Sustainability–West (EFS–West). Many thought that EFS–West would be one of a number of regional organizations that would allow campus sustainability advocates to work together. EFS–West provided both tangible and intangible benefits to its institutional members. It was a professional home where one could find others who were working on sustainability on their campuses. It also began the development of an online resource center and a newsletter that collected and published stories and materials from other campus sustainability advocates.

In 2004, EFS–West held a conference for sustainability advocates in Portland, Oregon, with nearly 400 individuals from across the USA and Canada attending. This high level of participation led the EFS–West board of directors to hold a discussion concerning the future of EFS–West. There was uncertainty about the stability of its funding base as well as questions about the capacity of EFS–West to meet the needs of such a large constituency. During the next 6 months, the board decided that EFS–West should transform into a national organization. In January 2006, the Association for the Advancement of Sustainability in Higher Education was officially launched. One of the important decisions made by the new leadership of AASHE was to base its financing on institutional membership wherein all individuals affiliated with an institution would have access to member benefits. EFS–West had been supported largely by foundation grants, and the leadership felt that a member fee-based strategy would lead to better financial stability. By July 1, 2006, 47 colleges and universities had paid membership dues to AASHE. In addition, several business and higher education associations had joined and were publicizing AASHE throughout the USA.

### ***AASHE Mission and Vision***

When AASHE was formed, there was a general notion about its purpose. The bylaws developed in the early years of the organization stated “Our mission is to promote sustainability in all sectors of higher education, from governance and outreach, through education, communication, research and professional development.”

As the organization entered its third year, some of the board members became concerned about a lack of focus and decided that a strategic planning process should proceed to develop a well-stated mission, vision, and objectives. In 2008, the board of directors adopted a mission statement, a vision statement, and a set of goals. The revised mission statement is:

AASHE’s mission is to empower higher education to lead the sustainability transformation. We do this by providing resources, professional development, and a network of support to enable institutions of higher education to model and advance sustainability in everything they do, from governance and operations to education and research. (<http://www.aashe.org/about/aashe-mission-vision-goals>)

In 2011, the board revised the goals to indicate a shift in the organization from being a reserved collector and disseminator of information to become a leader of

campus sustainability and a collaborator with organizations worldwide. The new goals were as follows:

Extending its role as a thought leader for higher education sustainability, AASHE will:

1. Deliver services that increase its value to a growing and diverse membership and will increase its impact on sustainability in higher education;
2. Convene experts and collect, evaluate, and disseminate information and tools to increase the understanding of sustainability and its relevance to higher education stakeholders;
3. Support and enable higher education to reduce greenhouse gas emissions and to adapt to the impacts of global climate disruption;
4. Lead the transformation of educational practices (including the curriculum) to ensure that all students acquire the knowledge, skills, and dispositions to meet sustainability challenges;
5. Lead the assessment and reporting of metrics of sustainability in higher education for the purpose of driving improvements in sustainable practices and education through its Sustainability Tracking, Assessment, & Rating System (STARS). (<http://www.aashe.org/about/aashe-mission-vision-goals>)

Although the board did not change the mission or vision at that time, there was clearly a sentiment that those statements would need to be revised to better reflect the more confident posture of the organization.

## **AASHE as an Information Node**

The earliest work of AASHE was to change the online resource center and the newsletter that EFS–West had maintained to a national scope. This move was consistent with the goal of AASHE to serve as a node for collecting and disseminating information about campus sustainability efforts. It was becoming evident that an increasing number of stories about campus sustainability operations were emerging and that there was a demand for sharing these stories.

Today, the *AASHE Bulletin* is a weekly compilation of news, opportunities, new resources, jobs, and events related to campus sustainability. It is delivered electronically and currently has nearly 11,000 subscribers. The *AASHE Bulletin* and the Online Resource Center are important resources for the campus sustainability community and provide information to tens of thousands of individuals each month. The access to resources, along with professional development opportunities, is the main reason that campuses renew their membership.

### ***Online Resource Center***

The Online Resource Center provides members with access to three types of resources focusing on campus operations. The three categories are:

- Education and research—cocurricular education; curriculum; research; surveys of sustainability awareness, attitudes, and values; and sustainability faculty development workshops.

- Campus operations—buildings, climate, dining services, energy, grounds, purchasing, transportation, waste, and water.
- Planning, administration, and engagement—assessment tools, reports, and indicators; financing; investment; coordination and planning; policies; campus sustainability officers; and campus sustainability Web sites.

Although the resource center is intended for all members of the campus sustainability community, it is clear that the most consistently served group has been campus sustainability staff. Web site analytics generally indicate that as much as half of the AASHE member traffic is coming from sustainability staff although these individuals represent a very small proportion of the potential member users. Consistent with its role as an information node, AASHE has also been active, both individually and in partnership with other organizations in producing and distributing on its Web site a variety of publications. These include how-to guides like:

- *A Guide to Developing a Sustainable Food Purchasing Policy.*
- *Raise the Funds: Campus Action Toolkit.*
- *Cool Campus: A How to Guide for College and University Climate Action Planning.*
- *Accelerating Campus Climate Initiatives: Breaking Through Barriers.*

Recently, AASHE has served as a partner for editorial support on publications such as the Sustainable Endowments Institute's *Greening the Bottom Line: The Trend Toward Green Revolving Funds on Campuses* and the US Green Building Council's, *Roadmap to a Green Campus*. AASHE also conducts surveys that lead to publications such as the *2010 Higher Education Sustainability Staffing Survey*. The only AASHE publication related specifically to the teaching and learning of sustainability is *Sustainability Curriculum in Higher Education: A Call to Action*. This is a very different type of publication in that it grew out of a meeting that AASHE held to develop next steps for moving the higher education sustainability curriculum to a much greater scale. The *Call* is a challenge to institutions of higher education to take a variety of steps to do more in the areas that support faculty to teach sustainability.

## **AASHE as a Source of Professional Development**

The professional development workshops for faculty have been an AASHE staple since its beginning. In 2006, Geoff Chase, a board member from San Diego State University and one of the founders of the Ponderosa Project at Northern Arizona University, and Peggy Barlett, a founder of the Piedmont Project at Emory University, approached AASHE regarding offering national workshops for faculty members who were interested in replicating those two projects on their campuses. The workshops, which have evolved into the AASHE Sustainability Across the Curriculum Leadership Workshops, are offered twice a

year: in January in Atlanta, Georgia, and in July in San Diego, California. The Web site describes the workshops as follows:

Through an intensive 2 days of presentations, exercises, discussions, reflection, and planning, participants will become familiar with the philosophy of change in higher education developed through the Ponderosa Project at Northern Arizona University and adapted at Emory in the Piedmont Project. Participants will also experience a range of workshop strategies, hear local experts, enjoy outdoor place-based activities, and dialogue with faculty from around the country as they gain help in adapting this model to their own campus. In a supportive and stimulating environment, workshop members will reflect on their own roles in the transformation of higher education. Readings and materials will also be provided. (AASHE, 2011)

Through these workshops, nearly 400 individuals from more than 200 institutions have received training on how to become a leader on their campus in helping and supporting other faculty members in teaching sustainability in their courses. AASHE estimated that at least half of the participating institutions held workshops at their campuses and have trained and supported more than 5,000 faculty members in teaching sustainability. Although that number may seem impressive for a program that received no designated federal, state, or foundation funding, it pales in comparison to the need for reaching tens or hundreds of thousands of the more than 1.5 million faculty members in the USA and Canada who could be teaching sustainability in their courses.

## AASHE and EfS

It was in this context that in summer of 2009 a group of higher education sustainability leaders met in Arizona to discuss how AASHE might move the academic sustainability agenda forward to reach greater scale and impact. The outcome of the meeting was a decision for AASHE to create a Summit on Sustainability in the Curriculum to bring together higher education leaders to address the following goals: (1) identify key challenges for infusing sustainability successfully and quickly into higher education; (2) acknowledge initiatives already underway; (3) describe opportunities for building on, extending, and developing further strategies; and (4) present recommendations for broad national strategies for meeting these challenges.

In February 2010, a group of 40 individuals including faculty members from a variety of disciplines and types of institutions, leaders of the EfS movement, and leaders of national higher education organizations gathered to address these issues. The 2 days of meetings resulted in the document, *Sustainability Curriculum in Higher Education: A Call to Action* (Rowland & Chase, 2010). The document presents five critical actions that are needed:

1. Increase the capacity for providing faculty with the necessary professional development, resources, incentives, recognition, and support for developing and implementing EfS curricula.
2. Develop and implement strategies for using existing leverage points of educational reform to expand the opportunities for students to develop the knowledge, skills, and inclinations to become leaders of the sustainability transformation.

3. Engage in conversations that clarify the goals, objectives, student learning outcomes, underpinnings, and nomenclature surrounding EfS and develop and implement strategies for communicating to policy makers and the general public the purpose and principles of EfS.
4. Develop and implement strategies to integrate EfS throughout the campus, engaging faculty and students with administrators and staff in using the campus and the community as the context for EfS.
5. Establish public and private funding mechanisms that will provide adequate funding for ongoing EfS efforts.

Of the numerous strategies for moving EfS forward with both speed and scale, four approaches emerged:

1. Creating an AASHE Faculty Fellows program would provide opportunities for faculty to make contributions to the national ESD community and receive recognition for creating and implementing the EfS curriculum.
2. Establishing regional centers would provide support, training, and resources to faculty so they could work with existing regional organizations.
3. Recognizing the powerful force that assessment, accountability, and accreditation exert on an institution could present opportunities for integrating sustainability into the curriculum.
4. Creating an ongoing collaborative for curriculum change that brings together diverse groups to discuss the complex issues related to EfS has the potential to provide long-term engagement of faculty around the teaching of sustainability.

These four strategies, described in detail in the *Call to Action*, have become central to AASHE's efforts to support campuses in increasing their EfS efforts. In developing plans for supporting campuses, we have worked with our constituents to begin implementing various activities for EfS. For example, we have been working with regional groups like the Upper Midwest Association for Campus Sustainability (UMACS) to provide a regional workshop for faculty leaders (Rowland, 2011).

Another strategy for leveraging existing resources has been to work with colleges to develop supplementary questions for the National Survey of Student Engagement (NSSE). This survey addresses a wide range of issues pertaining to student engagement with more than 1,000 institutions participating. The NSSE allows campuses to add local questions to gauge student engagement in specific areas. AASHE is creating common questions that could be used by institutions to determine the impact of their sustainability coursework.

## STARS

Early in its existence, AASHE was asked by some higher education associations to develop a common, comprehensive system for measuring campus sustainability amid the variety of surveys, ratings, and rankings that were emerging around green



campuses. After several years of development, pilot testing, and receiving input from nearly 300 individuals in the campus community, the Sustainability Tracking, Assessment & Rating System (STARS) was launched, and within 1 year, more than 200 institutions were participating in the program. STARS is a self-reporting assessment that allows institutions to accumulate points for various campus sustainability activities, from their curriculum and research to the energy operations and diversity policies. Participating institutions submit their evaluation materials and can be awarded a rating ranging from bronze to platinum based on the relevant points that they earn.

During the development of STARS, there was no question that institutions would need to assess their progress in providing sustainability education. As AASHE developed the system for assessment with the campus sustainability community, it became clear that although there was agreement that teaching sustainability was a critical role of an institution, measuring how successful an institution was in meeting sustainability education goals was going to be difficult. Indeed, it was clear that many institutions had sustainability curriculum goals as a result of signing the Talloires Declaration or the American College & University Presidents' Climate Commitment, both of which acknowledge the central role of a university in ensuring that its graduates received sustainability education. What was controversial was the method for determining how successful a campus was in doing so.

The issue of measuring success in sustainability education is controversial for two reasons. First, what counts as EfS is not clearly defined. Degree programs in sustainability and their coursework are often considered to be obviously focused on sustainability, while courses in art history are often considered out of bounds. However, if sustainability is thought of as being a foundation of all of what we do and how we view the world, it is difficult to see how any particular discipline should be "out of bounds." The crux of the problem is that we have not reached clarity on sustainability as a content area, a way of knowing the world, a way of solving problems, or an ethical position. Without greater clarity on the meaning of the construct, we continue to have problems knowing how well we are doing it.

The second reason we have difficulty in developing metrics EfS is that our university curricula are so variable. What counts as EfS in a workforce development program may be completely foreign to faculty in a traditional liberal arts program. Likewise, what makes sense as a student learning outcome in a graduate-level professional course may seem too narrow and focused for what counts with lower division undergraduates. The challenge then will be to recognize the student learning outcomes for particular programs and professions while also searching for the commonalities that can serve as general education learning outcomes.

## **Additional Challenges for Institutions**

Institutions continue to face challenges in developing EfS. First, we look at institutions planning to develop a new sustainability program. For some institutions, it is unclear where to put sustainability. As the following stories of success illustrate,



there are many possible answers to that question. In many cases, the question of the academic home for sustainability is not a conceptual issue; rather, it is a political one. In particular, the existence of traditional departmental structures can stymie discussion of new interdisciplinary structures that might create new and different forms within the institution. Coupled with the challenge of finding an academic home for EfS programs is the issue of resources. In some cases, new resources have been found or reassigned to these new programs and courses. In other cases, no new resources have been allocated, and a shuffling of responsibilities has provided the staffing for these programs.

Campuses trying to integrate sustainability into the existing curriculum face a different set of challenges. First and foremost is the threat such an approach can pose for faculty members. Indeed, some might claim such an approach is a threat to academic freedom. Among others, will be the following questions: How will it fit with what I do? Do I know enough to teach it? How do I teach it? What do I stop teaching? How will I assess it?

Finally, an important challenge we face is how we bring the academics of sustainability together with campus operations and community outreach. Advocates of the living, learning laboratory approach to EfS argue that the best learning is that which occurs in the real-world settings. Campus operations and community projects provide that opportunity, but concerns and questions about the efficacy and staffing of such programs persist from both the academics and the operations and community staff.

## **Stories of Success**

Despite these challenges, and many more, we also have some important success stories that are well worth noting.

First, we look at a campus that has taken on what some have called the greatest challenge in curriculum change, the general education curriculum. In 2008, Furman University (South Carolina) initiated a program that requires all students to take at least one course that focuses on the relationship between humans and their natural environment. During the subsequent year, 31 courses that met this requirement were offered in 11 different departments. To enable faculty to modify their courses to meet this requirement, the Shi Center for Sustainability conducted a 2-day intensive Faculty Workshop for Infusing Sustainability into the Existing Curriculum. By the end of 2010, 47 faculty members in 21 of the 24 departments had participated in the workshops. Although there have been significant efforts to ensure that all students have access to sustainability-related coursework, there has also been attention to creating specific programs for future sustainability professionals. In 2010, the faculty unanimously approved a new major in sustainability science. Another hallmark of Furman's approach to sustainability is its integration of student

research and community outreach. Furman faculty, staff, and students participated in six presentations and eight posters at the 2011 AASHE Conference in Denver (David E. Shi Center for Sustainability, 2010).

A very different approach to sustainability education was taken at Arizona State University (ASU). In 2004, under the leadership of President Michael Crow, ASU established the Global Institute of Sustainability (GIS) to educate the next generation of sustainability practitioners, entrepreneurs, and leaders. The GIS advances research, education, and business practices for an urbanizing world. The director was also named chief sustainability officer of the university. The combination of education, research, and operations activities led to a high level of collaboration on innovative approaches to campus sustainability. One significant outgrowth of the institute was the formation of an academic, degree-granting unit, the School of Sustainability in 2007. The school offers sustainability degrees at the bachelors, masters, and doctoral levels as well as several certificates. At the other end of the spectrum, all ASU entering students are required to take ASU101 in which sustainability is one of the core themes. A variety of campus operations measures in water and energy conservation, transportation, and food services make sustainability a daily part of student, faculty, and staff life (Leland, 2008).

At the University of British Columbia (UBC), the Sustainability Teaching and Learning Office coordinates and supports both graduate and undergraduate programs and courses located across the campus. UBC offers more than 25 sustainability-related programs and 350 sustainability courses. In addition to the office's staff, it also receives support from UBC Sustainability Initiative Teaching and Learning Fellows. The fellowship program "brings together outstanding UBC faculty members who are leaders in sustainability education to share their ideas and make contributions to sustainability learning opportunities on campus" (University of British Columbia, n.d., para 4). Their activities include co-teaching an introductory course, assessing educational offerings, assisting faculty in integrating sustainability into their courses and programs, and developing independent projects of either a research or a course development nature.

Dalhousie University established Canada's first College of Sustainability and a major in Environment, Sustainability, and Society as a means of integrating information from the disciplines to create an interdisciplinary understanding for solving real-world problems. Indeed, the focus of the program is developing new problem-solving skills through problem-based coursework. The program is shaped both by the issues it explores and a pedagogy of internships and community projects (Dalhousie University, n.d.).

It is clear that each institution has its own way of shaping how it will bring EfS to its students. Given the different cultures, missions, expectations, roles, and responsibilities of the more than 4,000 higher education institutions in the USA and Canada, this is not only to be expected, it is as it should be.

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## Chapter 18

# Warren Wilson College: Modeling Sustainability Through a Triad of Education

Catherine Reid

Warren Wilson College is a liberal arts college in western North Carolina that has been pioneering education for sustainability for many years. Warren Wilson is illustrative of a convergence of values, place, and curriculum that creates an ideal laboratory for innovative teaching and learning for sustainability. This chapter provides a vivid description of the many ways that Warren Wilson is a living example of how an institution of higher education can be reoriented to address sustainability.

For most visitors to Warren Wilson College, the initial reaction is to the seamless fit of the campus into its surroundings, with cropland and grazing pastures occupying the valley floor, and dorms and classroom buildings tucked into the hillsides. A river runs through the valley's middle, and forests encircle the fields. The place hums with activity, much as it does at any school, though closer inspection reveals dramatically different student occupations as most are engaged in some form of labor, whether driving tractors or backhoes, running chainsaws or drills, cleaning dorms and classrooms, or staffing the library's circulation desk.

A student-led garden tour, popular with elementary and middle school groups, or a campus tour via the admissions office, a route of choice for prospective students and their families, will do much to acquaint newcomers to the workings of the campus. For an introduction into the college's commitment to sustainability, however, The Green Walkabout<sup>1</sup> offers the most focused look at a variety of intentional practices.

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<sup>1</sup> Details of The Green Walkabout© are available at the college's Web site: [www.warren-wilson.edu/~ELC/New\\_ELC\\_Website\\_/Green\\_Walkabout.php](http://www.warren-wilson.edu/~ELC/New_ELC_Website_/Green_Walkabout.php)

C. Reid (✉)  
Warren Wilson College, Swannanoa, NC, USA  
e-mail: creid@warren-wilson.edu

The Walkabout can be self-guided, as a series of plaques list highlights and educational emphases of each site. However, someone taking a self-guided tour would miss the buoyant narrative and detailed descriptions of Stan Cross, the current education director of the Environmental Leadership Center. His tour begins at Orr Cottage, a LEED-Gold<sup>2</sup> certified building that houses many of the administrative offices. Described by Cross as a blend of the practical and the poetic, Orr Cottage was constructed by students from 15 different campus work crews, using stone from local mountains, wood from the campus forests, and recycled doors and furniture to outfit the interior. The view from the patio is of the college farm and distant hills, while the immediate slope down to the valley is planted in a rich mix of native plants. As Cross points out, the south-facing orientation of Orr, which offers sunlit offices and maximum solar gain during cold winter months, and the decision to plant using indigenous species represent the kind of paradigm shift that sustainability decision-making supports. For individuals used to college campuses with wide lawns and stately trees, a hillside of native grasses can appear ragged and overgrown. According to Cross, when visitors see the hillside in full bloom, abuzz with scores of native pollinators, and when they are made aware of the minimum requirements needed for its maintenance (the slope is burned each spring rather than mowed, which eliminates the need for fossil fuels), they are forced to rethink their familiar aesthetics and soon come to see unkemptness as beautiful.

The 265-acre college farm, next stop on the walk, has been in continuous operation since the school first opened in 1894 and has had an emphasis on sustainable agricultural practices since 1996. Products include hormone- and antibiotic-free beef, pork, and poultry, which are used in the cafeterias and sold to the public, along with such grains as barley, wheat, and oats, grown with 30–50% higher yields than other North Carolina farms. Pre-vet students attend to much of the animals' medical care, and environmental studies majors often conduct research required for their capstone projects here.

At the forestry crew's shed, visitors learn about management practices of the 640 acres of forest and about the immediate integration of academic knowledge and fieldwork, as many of the crew members are also sustainable forestry majors. In addition to selective harvests of timber for campus construction and firewood for faculty and staff, the crew also nurtures seedling nurseries, cultivates shitake mushrooms, and maintains miles of campus trails.

The distinct scent of composting matter, along with the tumble of glass and clash of tin, marks the recycling crew's area, where over 500 tons of trash and recyclables are processed each year, and more than 25 different kinds of materials are reclaimed. Behind the long metal sorting bins stand a series of sheds filled with baled cardboard, scrap lumber, and a free store that offers used clothing and household items. The crew also feeds and maintains the Green Drum, the latest and most efficient means of composting food scraps and vegetable waste (and inaccessible to the bears

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<sup>2</sup>LEED stands for Leadership in Energy and Environmental Design. This is a standard for Green Building established by the US Green Building Council.

who frequented the earlier sites); every 10 days, the crew off-loads nutrient-rich matter that will nourish the garden in another 3 months.

At the 5-acre garden, students seed, weed, and tend to vegetables and berry crops with active beehives, a pen of chickens, and a pair of Belgian draft horses nearby. The three adjacent buildings, the garden and herb crew cabins, and the blacksmith shop, are all student-built from local materials, and each appears neatly woven into the fabric of the land. Thousands of pounds of vegetables are produced from the garden each year, though an equally important asset is the chance for visitors and community members alike to witness the benefits of a low-impact, high-yield, organic-based system, operating in sharp contrast to the nation's industrial-based systems that supply food at considerable human and environmental cost.

The last leg of the Walkabout is the EcoDorm, a Leadership in Energy and Environmental Design certification for Existing Buildings (LEED-EB) certified Platinum building and home to 36 students. Completed in 2003, the project began as an initiative led by students to create a building that put their values into practice. Working with staff, faculty, and architects, students helped ensure that the dorm would be as efficient and environmentally friendly as possible. Materials used in its construction include recycled steel for the roof and old fence posts repurposed into cabinets and wainscoting. Water use is optimized through permaculture landscaping and composting toilets, while rainwater is collected in a reclaimed 10,000-gal train tanker car. To control heating and cooling (the dorm has no air conditioning), passive solar gain is supplemented by radiant floor heating and a high efficiency boiler, while mechanically operated windows and ceiling fans vent the day's heat. From the exterior view of gardens and fruit trees, clotheslines and solar panels, to the esthetically pleasing lines and sunlit rooms of the building's interior, everything about EcoDorm suggests the possibilities that exist when all parties labor together to ensure best sustainability practices.

The setting, the facilities, and the strong evidence of community involvement enable Warren Wilson to be an ideal laboratory for sustainability education, an example of the model school described by Cortese (2010) in his call to colleges to take a greater role in creating healthy, just, and sustainable societies. According to Cortese, the ideal college or university is one that "would operate as a fully integrated community that models social, economic and biological sustainability itself and in its interdependence with the local, regional and global community" (p. 9). This description sounds much like Warren Wilson College.

The college's relative success<sup>3</sup> can be traced to several variables: our Triad of learning and unique status as a work college, a fidelity to our history of self-reliance

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<sup>3</sup> In 2004, the National Wildlife Federation recognized the college as 1 of 24 institutions in the nation (of the more than 3,200) with "students and staff working for a sustainable future." In 2006, Warren Wilson received a Campus Sustainability Award from the Association for the Advancement of Sustainability in Higher Education (AASHE). In 2008, *Sierra* magazine identified Warren Wilson as fourth in the nation's leading colleges and universities that stand for an "overall commitment to sustainability." See the college's Web site for a list of additional awards and recognitions: [www.warren-wilson.edu/~elc/awards.php](http://www.warren-wilson.edu/~elc/awards.php) [Accessed 30 May 2011].

and environmental awareness, and our engagement of students in every level of decision-making, as they are the ones relentlessly challenging all of us to act as global citizens in a right sharing of world resources. With these elements in place, our academic program is well equipped to fulfill the college's mission in offering a distinctive liberal arts education "committed to environmental responsibility, cross-cultural understanding, and the common good."

## Warren Wilson's Triad of Learning

Warren Wilson College had its beginnings as the Asheville Farm School, founded in 1894 by the Women's Home Missions Board of the Presbyterian Church USA. The goal of the school was to provide poor mountain boys living in an area without public schools, with an education that balanced productive work and classroom study. Over the subsequent decades, more options became available for young people in the area, and the lower grades were discontinued while a high school was added in the 1920s. In 1942, the school began the transition to become a coed junior college, and by 1967, it was designated a 4-year liberal arts college. In 1973, the Presbyterian Church relinquished its control of the college to an independent Board of Trustees. While many other small colleges struggled with their identities during the shifting demands of the 1970s and 1980s and have done so again as the value of a liberal arts education is being debated, Warren Wilson never strayed from the key elements of its history. Its three-pronged approach to education—classroom learning, meaningful work, and civic engagement with local communities—became known as its Triad of work and service, while its organization as a work college, though occasionally challenged, was never altered.

It is this last feature that marks Warren Wilson as truly unique from its peers. Work colleges, of which only seven exist in the USA today, are notably different from those that offer on-campus work study (a federally funded program that subsidizes income-qualifying students at the nation's colleges and universities), and they offer a vastly different experience of work from that of students who labor to pay their bills with off-campus employment. At a work college, every student must work, regardless of income.<sup>4</sup> At Warren Wilson, every student is required to work 15 h per week on one of the 127 different crews, which range in size from 1 to 45 members, and which, taken together, perform most of the labor of the school. Descriptions of each crew's areas of responsibility are included in the college catalog, along with a list of its particular educational opportunities. Each crew has a supervisor (a member of the staff or faculty or a trained professional) who balances the twin goals of education and work productivity. Students are evaluated each semester and given grades on their performance; they, in turn, evaluate supervisors and offer suggestions for improvement.

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<sup>4</sup>Information about work colleges can be found at the Work College Consortium's Web site: [www.workcolleges.org](http://www.workcolleges.org)



For incoming students, this can be a difficult load to juggle—an average of 16 academic credits per semester, 15 h of work each week, and a minimum of 100 h of service to complete prior to graduation<sup>5</sup>—but the rewards for such integration are many. The intellectual power nurtured in a strong academic program is put immediately into practice through the kind of problem solving required in their work and service activities. Students quickly develop time management skills, a sense of responsibility for the work of their crews and an immediate, intimate understanding of what it takes to be a member of a multilayered, complex community. Innovation is rewarded, mistakes are accepted as a natural part of the process, and mutual respect for one another's contributions undergirds all relationships. Most importantly, students learn that their labor matters to the health and well-being of all of us and that each contribution, each mistake, and each creative response to a new dilemma adds to the school's collective narrative and to a shared sense of belonging.

Similar transformations happen through students' service work, though, because such projects happen off campus, they are the least visible component of the Triad. Service, however, is an area to which the college has been committed since the Asheville Farm School days, with the first formal service requirement instituted in 1960 and the first quantitative requirement in 1969. Service hours can be completed during the week, assisting, for example, with local food pantries, in animal shelters, in community gardens, or in computer training courses for older adults; more intensive experiences involve week-long trips during semester breaks, engaging in such work as disaster relief, trail maintenance, shelter building, and general maintenance and repairs at Native American reservations. Service-learning and international program courses integrate service experiences in ways that develop further students' understanding of the complexity of issues such as hunger, illiteracy, homelessness, and environmental degradation, along with the realization that only a collective will and innovative responses will address their root causes.

A vital sense of empowerment arises from such experiences; students learn that they are responsible not just for the functioning of the community but for ensuring that the community reflects sustainable practices as well. They regularly propose new crews (a few recent examples include blacksmithing, environmental justice, fiber arts, and fine woodworking) as well as a variety of campus-wide initiatives. In addition to EcoDorm and the extensive recycling program, students helped establish the popular Cowpie Café. This cafeteria was put into operation in 1999 after the administration proposed a fast-food venue. Students were quick to protest the plan. Such food, they claimed, was produced through unsustainable practices and bore no relationship to the values of the college. Drawing on their sustainable agriculture and environmental economics classes and working with the local manager of the campus food service provider, they proposed a viable alternative to the menu at the main cafeteria, one that offered vegetarian food and used as much produce as possible from the college garden or local farms.

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<sup>5</sup> This 100-h requirement is undergoing change, as the school shifts toward a more issues-based service requirement, with a new policy set to begin in the 2012–2013 academic year.



## **From Stewardship to Sustainability: The Evolution of Environmentalism**

Stewardship and self-reliance have been part of the campus ethos, beginning with the first farm school days. Students were expected to work on the farm or in the garden, in the forest or in the shops, growing and harvesting or crafting and repairing almost everything required to feed and supply them. Sound agricultural methods were central to the school's original mission, and, with the addition of science courses into the curriculum, more use was made of the forests and fields as places of study. By 1977, an environmental studies program was developed, which soon became the environmental studies major that continues to be the most popular on campus today. A forest management plan, written in 1980 by Alan Haney, a faculty member, and his students, was the earliest written environmental policy or written environmental commitment statement in the college's history (Casey, 2008). Its highest priority was the protection and enhancement of forest resources; second was maintenance of its aesthetic environment, while last on the list was harvesting wood for lumber, posts, and firewood.

A commitment to recycling began in 1981 and an environmental policy course taught by Laura Temple Haney led to the recycling crew's handling of paper, glass, plastic, and metals, and its subsequent joining with the local county to establish community recycling centers in the area. By 1990, the college had adopted a mission statement that further defined these practices: "WWC invites to its educational community individuals who are dedicated to personal and social transformation and to stewardship of the natural environment."

By 1990, the college was using "pattern language" to develop planning principles. This term was coined by architect Christopher Alexander (1975) to mean

any general planning principle, which states a clear problem that may occur repeatedly in the environment, states the range of contexts in which this problem will occur, and gives the general features required by all buildings or plans which will solve the problem (p. 101)

Using this construct, the Facilities Planning Committee adopted a set of principles for guiding future decisions, with such features as "campus will reflect its rural setting and village concept"; "the presumption is in favor of aesthetics and people in locating utilities, roads, buildings, etc."; and "design choices will prefer minimal environmental impact and maximal energy efficiency."

In 1991, new president Douglas M. Orr, Jr, established the Long Range Land Use Committee and charged it with using pattern language to craft a Land Use Plan for all campus operations. The plan, adopted by the college's governing bodies in 1996, included such guiding principles as: "No decision should be taken regarding use of the land, which would negatively affect the physical or philosophical sense of place that exists here"; "all decisions about land use should be tested by discussion and intuitive thought"; "the riches of the land that the College enjoys must always be seen as an endowment: as such they must be managed for the good of the

community”); and “everything at Warren Wilson must work for the common good. None of the land or its fruits should be neglected.” Additions to the Long Range Land Use Plan came from a variety of sources, including student crews (solid waste and hazardous materials); Student Caucus (campus parking); the farm manager and his crew (farm long range land use); landscapers and their crew (landscape); a wildlife biology class (native biodiversity, wildlife, and fisheries), and the CFO and assistant farm manager (purchasing) (Casey, 2008).

In 1996, President Orr invited John Huie, former director of North Carolina Outward Bound, to develop an Environmental Leadership Center (ELC) on campus. The goal of the center would be to raise awareness of local, national, and global environmental realities and to inspire members of the Warren Wilson Community to act as responsible caretakers of the earth. In subsequent years, the ELC, through its workshops, conferences, publications, and speaker series (which has included such guests as Jane Goodall, E.O. Wilson, Bill McKibben, and Sylvia Earle), helped raise Warren Wilson’s profile of sustainability both in the region and throughout the country. A year later, Orr established the Process Steering Group for an Environmental Campus which soon generated an environmental commitment statement<sup>6</sup> that received campus-wide approval. The agreement included a description of the college’s core values and emphasized the college’s deep commitment to the health of the planet embodied in the way members of the college community learn, work, and live. In addition to conserving resources, reducing waste, and eliminating pollution, the community acknowledged its membership in an interdependent web of social and ecological relationships. The statement concludes with the goal of developing “good environmental citizens who recognize and perform their duties and responsibilities as members of the larger human and ecological communities in which we live.”

More recent steps taken by the college, significant to this brief history, include signing the Talloires Declaration, which pledged the school “to create an institutional culture of sustainability” in its teaching, research, operations, and outreach (Association of University Leaders for a Sustainable Future, 2011). However, many in the community felt the Talloires Declaration was not strong enough, so a subsequent revision of the college’s mission statement included “a strong commitment to environmental responsibility.” In 2007, college president William Pfeiffer signed an agreement with the city of Asheville to collaborate on climate protection goals, and, in that same year, the President’s Advisory Council (PAC) adopted a sustainability framework to use in reaching decisions. In 2008, Pfeiffer appointed a Chief Sustainability Officer as part of PAC and, in 2010, signed the American College & University President’s Climate Commitment (ACUPCC) which includes, among other goals, a commitment to create a comprehensive inventory of all greenhouse gas

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<sup>6</sup> The full text of the agreement can be found at <http://www.warren-wilson.edu/environmental/sustainability/1997statement.php>

emissions on campus and draft a plan for becoming climate neutral.<sup>7,8</sup> Also in 2010, upon endorsement from the campus community and with approval of the trustees, sustainability was named a core value in the college's new strategic plan.

## Sustainability Education Rooted in the Classroom

Educators have long been drawn to Warren Wilson for its emphasis on experiential learning and for its embrace of the philosophy of John Dewey, who advocated learning that was both social and interactive. Since the 1930s, the educational philosophy at Warren Wilson has been "learning to do by doing" (Holden & Banker, 1994). In the years since, the faculty has labored to offer the kind of liberal arts education recently characterized by Rhodes (2006). This is in addition to a core curriculum that includes the natural sciences, social sciences, arts and humanities along with practical arts of technical discovery and invention, and that also emphasizes a way of thinking that invites sustainability-driven social change. Through the college's Triad of education, students put their studies into practice through work and service and then return to their classes, better equipped to contribute to the intellectual life of each course.

While designing a campus-wide sustainability curriculum has not happened as quickly as some might wish, such a goal fits with the natural arc of the school's history and mission. Many courses are currently offered that incorporate sustainability thinking, defined by Cortese (2010) as an openness to nonlinear thinking, collective decision-making, and inquiry-based learning intent on solving real-world problems (9–10). A sampling includes "Environmental Sociology" and "Gender, Women and Development" in sociology; "Sustainable Business Planning," "Sustainable Economics" and "Sustainability in Action" in business and economics; "Sustainable Development and the Politics of Growth," "Sustainable Farm Management," and "Climate Change and Sustainable Energy in Scandinavia" (a course that culminated in travel to Denmark and Iceland) in environmental studies. Several recent team-taught courses, designed as part of a grant-driven initiative to advance environmental literacy, have also been piloted. One of these is described below.

Of the classes incorporating sustainability, two from environmental studies—"Ecology of Food" and "Community Organizing for Sustainable Living"—stand out as models in the ways they integrate the Triad, nurture and rely on collaborative

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<sup>7</sup> Full text of the commitment and a list of signatories can be found at [www.presidentsclimatecommitment.org](http://www.presidentsclimatecommitment.org) [Accessed 31 May 2011].

<sup>8</sup> A comprehensive report, drafted by the Campus Greening Committee, provides the full list of the college's commitments, keyed to their respective documents, and includes a lengthy set of recommendations for integrating sustainability education and practices into every area of the college. The report, "Greening Warren Wilson: A celebration of the past, an agenda for the future," is available at [www.warren-wilson.edu/environmental/greening/index.php](http://www.warren-wilson.edu/environmental/greening/index.php) [Accessed 31 May 2011].

thinking, and provide students with the structures necessary for enacting their ideas. Each has also contributed campus initiatives that have added to a shared sense of common good.

Laura Lengnick, currently professor of sustainable agriculture (a concentration available through environmental studies), designed “Ecology of Food” as a service-learning course that, according to the course syllabus, “provides a thorough review and sustainability analysis of the U.S food system from an ecological perspective—the who, what, where and how of the food that America produces, processes, distributes, consumes and disposes.” Students read Kneen (1993), along with selected readings from such authors as Michael Pollan, Barbara Kingsolver, and Wendell Berry. Students in the course become fluent in describing the ecological, social, and environmental characteristics of the national food system as well as of local foodsheds as they work in teams to design projects that contribute to the sustainability of a local food system program. The service component of the course matches students with a variety of community partners including a local food bank, a community school, and an incubator business, Blue Ridge Food Ventures, which helps launch new food-related businesses through a shared-use kitchen, natural products manufacturing facility, and support for product development.

The second course, “Community Organizing for Sustainable Living,” has been offered for many years by Mallory McDuff, professor in both environmental studies and in outdoor leadership, and author of *Natural Saints: How People of Faith are Working to Save God’s Earth* (2010). The syllabus for this course presents a definition of community organizing as “a process by which people are brought together to act in a common interest” and of sustainable living as “a lifestyle for individuals or communities that could be sustained for many generations without exhausting natural resources.” Students in the course undertake a study of the principles and practices involved in changing human behaviors. Students read and discuss such texts as Kahn (2010) and McKenzie-Mohr and Smith (1999), and they learn how to conduct needs assessments, improve communication skills, and engage all relevant stakeholders in community campaigns. They then identify a specific sustainability need on campus and organize a campaign to address it. While some of the proposals are overly ambitious (damming the local river for hydroelectric use or rebuilding dorms using green building techniques), others have led to immediate results, including installing flushless urinals in one dorm, developing a green exercise park on the central campus, and initiating a local food crew, which dovetailed with the work of the Food Ecology class.

As Lengnick describes the interface of the two courses,

The real impetus for the local food crew and sustainable dining policy came from the Food class’ discovery that the organic black beans served in Cowpie traveled 23,000 miles from Tibet and were grown by Chinese peasants who were colonizing the country. (L. Lengnick, personal communication, April 6, 2011)

Shocked by this information, and aided by Lengnick’s and McDuff’s close collaboration, students were able to share data from the Food class with students working on community campaigns, creating a wealth of information to be used by the new local food crew. The course and crew also helped establish a committee that subsequently drafted a comprehensive sustainable dining policy. As a result of such

experiences, students in both classes reported similar feelings: They felt empowered to effect change, they connected their passions with the needs of a community, and they became part of something larger than themselves (L. Lengnick, personal communication, April 6, 2011; M. McDuff, personal communication, April 14, 2011).

Harnessing this kind of energy is one of the goals in developing pedagogies that incorporate sustainability thinking throughout the disciplines. An initial step in this process involved the hiring of a sustainability education consultant, Harold Glasser, in 2005, one of whose recommendations included creating interdisciplinary, team-teaching opportunities, for which all faculty members receive credit (instead of each taking on an overload). Subsequent faculty development workshops on sustainability curricula were led by Peggy Barlett, from Emory University's Piedmont Project in 2007 and by Debra Rowe, Senior Fellow at the Association of University Leaders for a Sustainable Future, in 2009. The college then named Laura Lengnick to the new position of Faculty Sustainability Education Director. Lengnick organized a series of interrelated workshops, "Interdisciplinary Teaching and Learning" (ITL), offered during the 2010–2011 academic year. These were co-facilitated by Carol Burbank, a Senior Fellow at the James Burns Academy of Leadership at the University of Maryland, College Park, and Karsten H. Piep, from the Interdisciplinary Studies Program at Union Institute & University in Cincinnati, Ohio. Lengnick also drafted a proposal for a sustainability minor and worked to formalize sustainability content in courses tied to common learning outcomes, as a way to ensure a consistent level of integrity in the curricular offerings.

Much of this recent work has been funded through two generous grants from the Arthur Vining Davis Foundation (AVD), and much is kept in motion through student expectation and faculty commitment. A course that serves as an example of the kind of multidisciplinary, team-taught approach the college is exploring through its AVD grant is "Coal: Community, Conflict, Culture, & Climate Change," which took place in Spring 2011 and was taught by Jeff Keith, an anthropologist; Robert Hastings, a geologist; John Brock, a chemist; and Paula Garrett, a literature specialist and Dean of the College. The goal of the course, according to the syllabus, was to "examine how burning coal as an energy source has influenced the organization of human societies, the cultural expressions of various writers within the Appalachian coalfields, and the degradation of ecosystems across the globe [through] the vantage points of history, literature, and science." In addition to classroom investigation of the effects of the mining and burning of coal on communities and ecosystems, the students spent a weekend in West Virginia, exploring firsthand the effects of mountaintop removal, the controversial opencast method of removing the tops of mountains to expose the seams of coal underneath. Along the way, students also learned much about interviewing, audio scripting, videotaping, the crafting of journals, and the creating of a Web site, where their completed work—two podcasts, two short videos, and two Web-based magazines—offers a dramatic rendering of their journey following coal.<sup>9</sup>

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<sup>9</sup> Completed projects from the Spring 2011 course, "Coal: Community, Conflict, Culture, & Climate Change," or "Learning from Coal," as it came to be known, can be viewed at their Web site: [www.learningfromcoal.org](http://www.learningfromcoal.org) [Accessed 31 May 2011].

A last and key development during the past academic year (2010–2011) has been the use of “roving experts” or rovers, who created curriculum through the ITL that could be used in classes outside of their disciplines. Each rover developed an activity with specific learning objectives and a list of deliverables. Each visited a class, presented a lecture that provided context for the assignment, and then set the group activity in motion. At the subsequent class, students discussed their group process, their responses to readings or data gathering, and the results of their activity and the ways it enhanced the content of the course.

One such example is psychology professor Kathryn Burleson’s contribution to a semester-long environmental writing class. Following an initial visit to describe the upcoming project—writing a children’s story on an environmental theme—she gave a lecture on adolescent development, outlining the stages of brain and cognitive development that allow children to engage with topics of increasing complexity. After reading several children’s books to the class, she then divided them into groups, each of which would write a short story appropriate either for 3–4-, 5–6-, 7–8-, or 9–10-year-olds. The results, read aloud at her third session with the class, met with considerable enthusiasm, as much for their sensitivity to their respective audiences as for the quality of the writing and evidence of a high level of engagement.

Rovers to other classes met with similarly positive responses by the participants, which underscores their potential for truly interdisciplinary learning experiences. Given the expense, both in time and in money, in creating and sustaining team-taught courses, the college is poised to use roving experts in future sustainability education.

## Goals and Challenges

In many ways, Warren Wilson is still catching up with its rapid growth (the school roughly doubled in size during a 20-year period) and is still defining the theory that best describes its practices. With a history of head, heart, and hand embedded in our Triad, the integration of which Cortese (2010) believes is required for transformative change, many of the structures are already in place to facilitate campus-wide sustainability education. A number of challenges will always be with us; for example, work colleges are, by their very nature, messy and inefficient. Students fulfill their work commitments around their academic schedules (which means a student in the auto shop may not finish her task before she has to leave for class; a paint crew worker may have to clean his brushes, even though the wall he started has not been finished), and the school loses roughly 30% of its trained work force each spring with that same percentage of new students arriving every August. In addition, a natural tension exists between the desires of the individual (a strong American impulse) and the needs of a community (often seen in greater harmony through service or worldwide study), yet we rarely take the time to explore this complicated dynamic. We are also well aware that service learning needs to be better incorporated into the academic curriculum (a common complaint from students is

that the two seem too detached). A new initiative on Issues-Based Service intended to remedy this situation will be in place by the fall of 2012.

None of these issues should be surprising; acknowledging differences and working through them is an integral part of experiential learning. Our consistency lies in graduating students who seem well positioned for futures we cannot yet imagine. One recent study (Wolniak & Pascarella, 2007) confirms that students from work colleges possess many of the characteristics sought by today's employers. They are adept at problem solving and are strong in communication and leadership skills; they also work well with members of a team and convey a positive sense of citizenship and of international issues. We have a long and strong record of accomplishment at providing opportunities to learn through living in community, and of course, we still struggle for greater certainty about best practices. As Rhodes (2006) points out, there is no single set of answers to "the broad range of questions that sustainability raises... We have yet to develop solutions." But if sustainability is taught "as an exercise in exploration and discovery, it may form the basis for a new kind of global map — a policy blueprint — that would allow us to set a common course for all the people of our rare, beautiful, and benevolent planet" (p. B24).

On a recent spring day, with community members engaged in such tasks as restoring native habitat for the mole salamander (a local species of special concern), analyzing a solar radiation model for use in identifying urban sites for solar panels, figuring out what they could buy with two dollars at the local grocery store (the amount available per day for families living in poverty in the local county), or moving cows to their next grazing pasture, it is clear that Warren Wilson College is nourishing leaders, who, in addition to helping to define that map, will facilitate positive change for all who dwell in the global community.

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# Chapter 19

## York University: Sustainability Leadership and Challenges at a Large Post-secondary Institution

Jennifer Foster

### Introduction

York University is Canada's third largest post-secondary institution, with a main campus occupying former agricultural land in northwest Toronto as well as an original campus set in a midtown wooded ravine. Established in 1959 as a public university, York is now used by approximately 53,200 students from 155 countries and some 5,000 faculty members, administrators, and staff. There are 10 faculties and 24 research institutes. The university prides itself on nurturing interdisciplinary learning. The facilities to run an institution like York are formidable, akin to administering a small city with a commitment to developing the most advanced and innovative research and learning, substantial employee base, and extensive infrastructure demands. The sustainability challenges at York are remarkable, but the university is dedicated to developing a comprehensive strategy for an environmentally robust, economically resilient, and socially just future. This chapter profiles the experiences of creating a pan-university approach to sustainability at York, including some of the most formidable challenges to conceptualizing and mobilizing such an approach.

The larger 457-acre main campus, the Keele campus, straddles the topographical highland between two of Toronto's major watersheds, hosting four woodlots and numerous groundwater discharge points, a ravine ecosystem, meadows, and a surface water retention pond. Hoover Creek runs along the university's western border. There are over 90 buildings on this main campus, including seven libraries and archives, and major sports facilities (such as the national tennis and track and field centers, as well as a six-rink Olympic-standard arena). The last 10 years have

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J. Foster (✉)

Faculty of Environmental Studies, York University, Toronto, ON, Canada  
e-mail: jfoster@yorku.ca

witnessed intensification of the Keele campus' built infrastructure with construction of several notable and award-winning buildings such as the Pond Road Residence, the Schulich School of Business, and the Computer Science and Engineering Building (the first "green" building in Ontario). There are currently 1,700 transit buses traveling through the Keele campus daily, but the extension of a subway line slated for completion in 2015 will introduce two new on-campus stations linking York directly to downtown Toronto. There is a cogeneration energy production facility on campus. In addition to faculty, staff, and classroom computers, there are over 2,000 computer laboratory workstations for students. More than 40 food outlets and an extensive waste management system are also operational. This campus is adjacent to one of Toronto's 13 "priority neighborhoods," areas identified as most urgently in need of investment. According to the United Way (2001), this neighborhood has very high rates of immigrants, newcomers, refugees, people of color, children and youth, single parents, low-income individuals, and low-income families, and a high rate of rental and public housing. The same neighborhood has low rates of employment and low post-secondary education and high school completion. The midtown campus, a bilingual campus focusing on liberal arts, is situated on an 85-acre wooded estate. Some of the main facilities at York's Glendon campus include a graceful mansion, a library, and athletics house, as well as two student residential buildings. Glendon is the university's original campus, now serving approximately 2,500 students. Nested into Toronto's extensive ravine system, this campus incorporates the protected slopes of the West Don River. The built infrastructure of the Glendon campus is also expanding, with two new facilities currently under construction. A shuttle bus connects the two campuses.

York has a strong tradition of activist politics, which has inspired robust debates about a wide range of concerns relating to sustainability. Like other progressive post-secondary institutions, a tradition of activism has fortified York's strengths in innovation, helping to propel the university to the forefront of contemporary global issues and debates and raised awareness of sustainability in institutional and personal practices across the university. For instance, student demand for enhanced sustainability led to many important advances, including a new "no sweat" policy that requires all licensees of York-branded apparel to register with the Fair Labor Association and disclose necessary information to the Worker Rights Consortium.<sup>1</sup> York's sustainability advances are also deeply rooted in ongoing institutional planning oriented toward sustainability objectives. For instance, thanks to a strategic traffic management plan, York has shaken its reputation as a "commuter campus," with a recent shift in the commuter modal split from approximately 70% single-occupant motor vehicles in 1998 to 65% alternative modes of transport, primarily public transit, in 2008. Administrators and managers have often been keen to collaborate with students to bridge academic goals and the work of campus operations through sustainability partnerships. For

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<sup>1</sup>The *York University Code of Conduct for Licensees* prohibits the use of forced labor, child labor, and engagement in harassment or discrimination. It also sets minimum health and safety standards, protects freedom of association and collective bargaining, and delineates wage and benefit standards, hours of work, and overtime compensation.

instance, for over a decade, an undergraduate course on the topic of environmental auditing offered by the Faculty of Environmental Studies combines theoretically and conceptually driven study with practical “on-the-job” experience working with university administrators to provide campus environmental information that is essential for sustainability decision-making. The students form green audit teams, gather and analyze information on yearly themes determined by administrators, such as food waste, transportation, water use, or energy efficiency in a particular building, and this material in turn informs ongoing planning (Stoesser, 2010).

## Sustainability Thinking and Action at York University

The precedents for sustainability accomplishments at York are vast. In terms of curriculum, the university offers extensive innovative programming directly related to sustainability in the Faculties of Environmental Studies, Law, Fine Arts, and Education. Departments such as Geography, Urban Studies, and Biology in other faculties also focus directly on sustainability. The Schulich School of Business has repeatedly earned top awards for sustainability leadership. In terms of infrastructure, each unit in the University’s Campus Services and Business Operations integrates sustainability into its ongoing work (from housing services to bookstore and printing operations to energy management and food services) and also maintains an Office of Environmental Design and Sustainability. Programs such as Yorkw!se have been wildly popular, designed to raise awareness of sustainability and quality of life by promoting sustainable practices and building a network of sustainability leaders based on peer-to-peer models. Research units such as the City Institute and the Institute for Research and Innovation in Sustainability (IRIS) disseminate research and provide critical opportunities to build dialogue. Where sustainability advocates at other universities often struggle to incorporate social justice and human rights into their strategies, York has a long-standing commitment to these values, captured in the university’s mission statement defining York as “A community of faculty, students and staff committed to academic freedom, social justice, accessible education, and collegial self-governance, York University makes innovation its tradition.” In this manner, for example, long-standing and emergent community engagement initiatives<sup>2</sup> have been coordinated through the TD Engagement Centre,<sup>3</sup> which opened as a satellite campus in the Jane-Finch neighborhood in 2009. Finally, there has been a great deal of high-quality sustainability research with major

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<sup>2</sup>For an inventory of community engagement activities ranging from financial assistance to capacity building projects to on-campus co-op placements for local high school students, please consult York University’s (2008) *Inventory of Community Engagement*, prepared by the Office for University Events and Community Engagement (<http://www.yorku.ca/uecr/inventory.html>).

<sup>3</sup>The center is funded by the Toronto Dominion (TD) Bank as a teaching, research, and resource facility for the community and the university.

funding from many sectors, resulting in a long roster of notable and influential publications, reports, and projects aimed at advancing sustainability.

In many respects, then, York is a pioneer among Canadian post-secondary institutions. As an early adopter of sustainability-oriented curriculum, social justice as a core institutional value, and numerous innovative resource conservation programs and projects, sustainability has been integrated into the university's fabric. However, until recently, there was no pan-university, coordinated approach to track these initiatives; provide a forum for understanding the sustainability concerns, desires, and preferences of the York community; and develop a comprehensive strategy for ensuring that sustainability remains knit into the university's fabric. Groups would often form to tackle a sustainability challenge, only to find that several other organizations may also have formed independently to work on the same issue. Lack of coordination sometimes resulted in replication of old mistakes, misunderstanding of ongoing efforts, groups competing with one another, or working at cross-purposes. Until recently, awareness of the university's sustainability achievements was rather low among the York community, with many expressing surprise when York was declared a "campus sustainability leader" by the Sustainable Endowments Institute in 2010 and 2011. Further, lack of coordination led to missed opportunities for university-wide dialogue focused on developing the most fitting sustainability strategies for the university as a whole.

In response to the need for coordination of sustainability efforts across York, during his inaugural year, President Mamdouh Shoukri established a council to act as a sustainability advisory board. Membership on the initial President's Sustainability Council included four student representatives (elected from the self-organizing Student Sub-Committee), four Vice-Presidents, two senior advisors, the Dean of the Faculty of Environmental Studies, the Director of the Center of Excellence in Responsible Business, the Director of Transportation and Master Planning of the York University Development Corporation, and the Director of the IRIS. The first two appointed chairs are professors with research and applied expertise in sustainability. The expectation was that it would meet monthly and operate year-round in perpetuity, including the spring/summer recess that typifies academic service and without disbanding after submitting an initial report in the manner of an issue-specific task force. Building on the momentum of student interest in sustainability that had already been channeled through the Office of the Vice-President of Students, this new Council's mandate was ambitious. From the outset, the specific directive of the Council was to:

1. Develop a framework for understanding the different dimensions of sustainability as relevant to the university's campuses;
2. Conduct a sustainability audit to establish a common understanding and benchmarks;
3. Provide a forum in which members may discuss sustainability challenges and opportunities and establish a pan-university approach to sustainability initiatives;
4. Identify and review current university sustainability practices and ascertain opportunities for synergies;

5. Through a planning/prioritization process, identify and examine specific high priority issues and develop recommendations for the President to consider implementing;
6. Develop a communication tool that will serve as a focal point for sustainability activities and initiatives at York; and
7. Produce an annual report on sustainability at York relative to the Council's activities.

In order to enact this new responsibility, the Council devoted its first few meetings to building a consensus framework for decision-making and understanding sustainability themes that are most important for York. To these ends, the Council's first meeting incorporated a "Future Search" exercise to build dialogue and generate ideas. The understanding of consensus that the Council adopted is one that emphasizes open discussion and respect for different perspectives with a view to arriving at decisions that everyone can live with (no "deal breakers"), even if these are not individuals' ideal outcomes. The next few meetings focused on establishing thematic foci to guide the Council's wide scope of engagement. The four identified areas are:

1. Administrative structure,
2. Curriculum and sustainability,
3. Social justice and human rights, and
4. Campus operations and development.

Working groups were established to engage in research, consultation, and analysis of each particular theme. The Council also organized a series of consultative sessions incorporating those with specialized knowledge, employee groups, administrators, students, faculty and staff, as well as open sessions for the broader York community. Council members attended various workshops and conferences of direct relevance to working group themes. Monthly discussions of each working group's progress and findings culminated in the recommendations presented in the Council's first annual report. The Council's first report (President's Sustainability Council [PSC], 2009) was prepared as a foundational document for shaping the overall direction of sustainability at York, including the following proposed vision statement on sustainability:

Our vision of a sustainable university is one that enhances the ecological functioning of its campuses; provides equitable access to opportunities for active engagement in life-long learning; creates knowledgeable, active and responsible global citizens; and does so within an integrated, long-term framework of full-cost economic and environmental accounting. (PSC, 2009, Executive Summary, p. 1)

The 2009 report also introduced five core principles for interpreting sustainability in ongoing decision-making—ideals that could lend guidance to ongoing decisions across the university. Drawn from Wheeler (2004), these are:

1. A long-term multigenerational perspective integrating full-cost economic and environmental accounting that includes social equity and human rights;

2. A holistic outlook that considers multilayered causes, and the connections and interplay among varied sustainability challenges, across disciplinary boundaries and administrative units;
3. Accepting limits by finding creative and innovative ways to achieve the university's mission and goals without compromising the social, economic, and environmental conditions;
4. A focus on place as a means of nurturing York's distinctiveness, building on its own strengths while safeguarding local ecosystems, and remaining committed to reducing local social inequities and engaging with local economies; and
5. Active involvement in problem solving by nurturing broad-based participation in planning.

This first report proposed 39 detailed recommendations for advancing sustainability at York, each of which denoted progress anticipated within the short term (12 months), medium term (1–3 years), and long term (more than 3 years). The 2010 report was prepared in a similar manner, incorporating more extensive consultation with the York community, assessment of progress in fulfilling the 2009 recommendations, and 22 new recommendations. Examples of recommendations contained in these two reports range from establishing a Community of Sustainability Ambassadors to supporting nondegree offerings in sustainability and establishing a university-wide green information technology program. President Shoukri accepted all of the recommendations proposed in the 2009 and 2010 reports. The Council's role in their fulfillment consisted primarily of overseeing their realization across the university, rather than acting as an implementing body. In doing so, the Council would strive to ensure that all parties were aware of and understood the recommendations, help envision means of realizing the recommendations where appropriate, and follow up to evaluate progress on their fulfillment. In 2010, the Council found considerable progress in fulfilling the 2009 recommendations, as well as York's overall standing in relation to the three pillars of sustainability (PSC, 2010).

The 2009 and 2010 recommendations are oriented toward both building a culture of sustainability and concrete steps for advancing the vision of sustainability proposed by the Council. The recommendations are remarkably diverse, tackling issues such as fair trade, green building standards, curriculum adaptation, emissions reduction, developing a university-wide information technology system, and fortifying the university's relationship with its neighbors. The Council has approached its annual reports as ongoing conversations with the York community, as means of communicating approaches and progress, but also as discussion pieces for refining a shared sustainability vision and strategy across the university. In this spirit, the Council has explicitly encouraged reaction to the contents of each report, through public fora, online submissions, in written response forms, and through direct e-mail to the chair. This approach has served the Council well, as many of the key directions that have been incorporated into each report reflect popular themes and direct input from the York community.

Sustainability has become a core institutional principle at York. While many both within and outside York are still getting up to speed on the university's commendable

track record, including achievements before and since the President's Sustainability Council, in April 2011, the York University Board of Governors approved a university-wide policy on sustainability developed by the Council (York University, 2011). This fulfills the 2009 report's first recommendation on administrative structure, incorporating the vision and five guiding principles identified by the Council, and delineating responsibility for implementing sustainability strategies throughout the university.

York's commitment to sustainability is serious, spanning all dimensions of the university. Beyond the realms of curriculum and research, in the past, advances were often the work of dedicated individuals or groups that had the foresight and initiative to weave sustainability into the university fabric through individual programs and actions. With establishment of the Council, adoption of the university sustainability policy, and other pan-university initiatives, sustainability has now become a core feature of York's identity. Through the early years of its work, the President's Sustainability Council encountered a number of challenges. Some of these challenges are likely to be familiar to anybody advancing a coordinated approach to any major concern in an institutional setting, but others are particular to York. The following section of this chapter profiles some of the complex challenges that the Council has confronted.

## **Key Challenges**

As the work of the President's Sustainability Council continues into its fourth year, it is useful to reflect upon some of the thornier aspects of its early experience. Four key challenges stand out as particularly worthy of note. These include continuously striving to engage the York community with sustainability matters, finding ways to seriously integrate human rights and social justice concerns, establishing the Student Sub-Committee as an effective forum for student-specific sustainability concerns, and integrating the particular needs and preferences of the Glendon campus.

## ***Engagement***

Effective and meaningful engagement with the York community has been a particularly challenging aspect of the Council's work. Diversity is York's strength, but it is also a challenge. Like any university, there is also a regular turnover of key actors, particularly students. The vast number of individuals associated with York necessitates a multifaceted approach to understanding the varied experiences, needs, desires, and preferences of the community. The York populace is spread out across the Greater Toronto Area, and individuals work disparate schedules that shift both seasonally and with academic terms. Thus, the idea of gathering a



representative proportion of the York community for a constructive discussion has never been a practical option, and the Council sought alternative, creative approaches to engagement.

The Council realized early on that no form of engagement could ever be complete and reach all corners of the university in a comprehensive manner. Even if it were possible to assemble over 57,000 people for a collective conversation, this would not capture evolving attitudes and sustainability encounters. Moreover, members were not interested in extracting a monolithic interpretation at a single point in time, but rather in working with the community over many years. Thus, the Council approached community involvement as an ongoing and continuous practice that focuses on disseminating information about sustainability at York, understanding sustainability experiences and views, and creating opportunities for interested parties to become directly involved in ongoing sustainability activities. Multiple sessions were designed to connect with different sectors of the university, with separate sessions for staff, faculty members, and students, as well as university-wide sessions. A comments box was also set up on the Sustainability Council Web site, and all York members were encouraged to contact the chair directly with any input. As engagement progressed, the Council was able to develop a more refined understanding of what the community considered the most pressing issues, what the best fit for York might look like, and which directions people wanted to see the university pursue. In many instances, the Council encountered critiques of its work, mostly related to low awareness of its work and the overwhelming scope of interest that the Council has assumed. The Council took these critiques in stride. One of the most challenging aspects of the engagement strategy was interpreting the diverse input in relation to development of new recommendations. Incorporating all contributions would be unfeasible, and varied suggestions were often at odds or impractical. The Council, however, was able to trace common themes among the often disparate input and reported on these even if they did not form the basis of existing recommendations. In many instances, the demand for particular sustainable action was so clear that the Council formulated recommendations that responded directly to issues such as reduction in paper consumption and development of a no-idling policy for motor vehicles. In other instances, Council members agreed to conduct more research and consultation before a recommendation could be formulated.

### ***Social Justice and Human Rights***

Integrating social justice and human rights concerns into York University's sustainability strategy presented another challenge for the Sustainability Council. As noted, social justice is integral to York's mission statement, and the university has strong commitments to preserving and advancing human rights through equity policies and other institutional mechanisms, as well as through regular robust public debates across both campuses. However, social justice and human rights concerns are not prominent features in the sustainability strategies of most post-secondary institutions.



For instance, sustainability agreements and texts, such as the Talloires Declaration<sup>4</sup> notes inequity and poverty as effects of unsustainable environmental management practices, the pledge for universities to become world sustainability leaders offers little concrete guidance situating social justice and human rights as central strategic concerns. Similarly, only a slim portion of the points earned in the appraisal index of the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS) focuses on issues related to social justice and human rights. Texts such as *Planet U: Sustaining the World, Reinventing the University* (M'Gonigle & Starke, 2006) emphasize democratic citizenship as an important element of sustainability, the working group focusing on social justice and human rights found very few examples of progressive integration of this theme from which to learn and envision possibilities for York. Although many active in campus sustainability research, thinking, and practice advocate strongly for human rights and social justice as an essential pillar of sustainability—for instance, prominent environmental justice and sustainability scholar Julian Agyeman (2002, 2005, 2007) was the keynote speaker at the 2010 AASHE conference—this is typically the pillar that is least developed. Some of the specific issues that the Council tackled include questions of delineating “York’s neighbors” and the communities most directly affected by sustainability decisions, determining which social justice and human rights concerns are most pertinent to York’s vision of sustainability, prioritizing and staging social justice and human rights concerns over a multiyear strategy for sustainability, and determining how to communicate the importance of social justice and human rights as a sustainability focus.

From the outset of the President’s Sustainability Council’s work, social justice and human rights was identified as an essential feature of York’s approach. Possibilities for defining the key relationships between social justice, human rights, and sustainability are endless, but in York’s case, there are some obvious needs and openings through which to begin situating a pan-university strategy. Based on the sustainability principle of focusing on place, enhancing York’s relationship with its most immediate neighbors was determined as the focus of the first two annual reports. In this spirit, the Council recommended fortifying existing programs linking the university with the Jane-Finch neighborhood (e.g., recommending measures to enhance the accessibility of a York education, York employment opportunities, and access to York facilities), rather than inventing new programs. This was not an approach that was universally understood or accepted, and was probably the issue that prompted the most resistance during consultative sessions, particularly leading up to release of the Council’s first annual report. Some expressed concern that York would become an “outlier” among post-secondary institutions focusing on sustainability. Others worried that social justice and human rights issues are difficult to measure quantitatively and are not prominent features of well-known assessment indices. A few even asserted

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<sup>4</sup>York is a signatory to the Talloires Declaration, a recommendation of the report of the 2001 report of the York President’s Task Force on Sustainability.

that social justice and human rights should not be part of York's strategy at all and that these were separate concerns unrelated to sustainability. By the second year of consultative sessions, no objections to the logic of incorporating social justice and human rights were voiced, and the Council continued to receive positive feedback on this theme, including many suggestions for expanding the impact of existing initiatives. With gradual recognition and acceptance of the Council's commitment to social justice and human rights, consultative discussions could advance from "making the case" for incorporating equity as part of the sustainability strategy to building creative and York-specific responses to social justice and human rights concerns. Recommendations proposed in 2009, such as to assess and develop outreach initiatives to attract applicants for employment from communities-in-need surrounding York, were revisited in the 2010 report to provide a more fine-tuned approach, for example, by focusing on workplace training opportunities, such as internships, skilled trade apprenticeships, and other employment training in collaboration with local partners and community initiatives.

### *Student Involvement*

Student involvement in sustainability issues has been critical to York's advancement in creating an environmentally robust, economically durable, and socially just university. In many instances, progress was a direct result of student activism, and the precedent for the Sustainability Council was a network of students working directly on sustainability issues with the Office of the Vice-President of Students. The students involved with the Council, as members of the Council itself or as active participants in the self-organizing Student Sub-Committee, have been knowledgeable, dedicated, and constructive in their service. But problems attracting students to the Student Sub-Committee have persisted since the Council's inception. Attendance at the Student Sub-Committee meetings has been patchy, with the highest turnout at the beginning of each fall term and inconsistent attendance through the rest of the year. The Student Sub-Committee is open to all York students, but regular introduction of new students has necessitated constant orientation to the Council's operations, the Sub-Committee's work, and the relationship between the two. Confusion about the latter has been a persistent challenge.

As a self-organizing group, the Student Sub-Committee identifies its own priorities, goals, and courses of action. However, the demands of academic cycles and regular turnover of graduating new students have meant that participation has been irregular, the result of which has compounded the challenges of mobilizing a self-organizing group. Council work can be demanding, yet students involved are not compensated financially and often find it difficult to balance study, employment, and other interests with voluntary Council work. Students have found it difficult to follow through on ideas and plans generated in this group. This has often been the case because the learning curve concerning York's operations and administrative structure is steep, and because the students have sometimes encountered a hierarchical

institutional culture where some key actors outside the Council are unprepared to work directly with students. Student involvement in the Council has been critical to York's sustainability achievements, but clearly there are particular challenges presented in sustaining and expanding such involvement. The Student Sub-Committee is exploring various models of self-governance drawn from other self-organizing groups, and the committed core of students continues to identify strategies for engaging more students. The Council has also recently secured internal funding for two 1-year full-time support positions, one of which is devoted to supporting student engagement. Finding ways to sustain and enrich student involvement is an ongoing challenge.

### *Glendon Campus*

The final challenge relates to integration of the Glendon campus into sustainability planning at York. Located remotely from the main Keele campus, where the vast majority of university business is conducted, it was often the case that Glendon was not at the forefront of the Council's thinking and planning. At several points over its first 3 years, the Council realized that it had not adequately considered Glendon needs and conditions. There were Glendon-focused outreach efforts, including an open session devoted to understanding sustainability specifically at the midtown campus. Although participation was sparse, the input from these Glendon-specific discussions was extremely valuable, helping shape a sense of sustainability that would not simply generalize the distinct experiences and needs of the two campuses. Moving forward, the Glendon Campus Environmental Advisor has joined the Council, members of the Student Sub-Committee are focusing on conserving and restoring the Glendon forest, and the Council will continue to address Glendon as a distinct campus with distinct sustainability needs.

### **Conclusions**

York University approaches sustainability as an ongoing process, not as an outcome that has a definitive endpoint. This approach is reflected in the establishment of the President's Sustainability Council, working through consultation, consensus, and constructive reflection on a progressive vision and guidelines to advance sustainability on a yearly basis. With a rich history of sustainability initiatives and a strong commitment to coordinating a pan-university strategy, York is able to advance sustainability in novel and meaningful ways. The challenges encountered in advancing this vision are considerable, and continuing to confront these challenges in considered and innovative ways will strengthen York University as an environmentally robust, economically resilient, and socially just institution.

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**Part VII**  
**The Practitioner's Voice**

# Chapter 20

## Both Sides Now: Music for Teaching and Learning Is Powerful, Useful, and Effective

Joyce Johnson Rouse

*Music is moral law. It gives soul to the universe, wings to the mind, flight to the imagination, a charm to sadness, and a gaiety and life to everything. It is the essence of order and leads to all that is good, true and beautiful.*

–Plato

Recently, as I prepared to interact with 100 preschoolers in a program called “Celebrate Earth,” a group of 20 children and their three teachers arrived an hour early. What I thought might be a disruption to my setup and sound-check time turned into a delightful lesson for me. In a quiet corner of the auditorium, an experienced teacher calmly took the children through a series of songs about the Land Down Under, its animals, oceans, and life forms. They were clearly well versed with the idea of habitat. When I approached them with my giant 4-ft blowup globe, they showed me where Australia was, then went on to their next ecosystem singing joyously as only confident 4-year-olds can! It was not a formal lesson, but clearly showed a teacher who loves the Earth and its diversity of life, sharing that love through music with her charges.

What is it about music that has this magical effect on people of all ages? Why does it strike to the heart of our existence with a power that comforts the aged, lulls children to sleep (thus called a lullaby), tunes us into helping find our spiritual center, and gets our bodies “sweatin’ to the oldies” or swaying to a seductive tango? Why does the music during the scariest part of a horror movie intensify our dread of what might happen in the next scene?

At one level, music is only physics, the vibrations of this vast and ancient Universe, echoing in wind blown through a wooden or metal flute, hammered on

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J.J. Rouse (✉)

Rouse House Music LLC (ASCAP) and Earth Mama ® Productions, Independence, VA, USA  
e-mail: joycerouse@mac.com

tuned wires or old metal oil drums. It is only the movements of fingertips on nylon strings, only air pushed through shaped lips to whistle while we work. And yet: “Music hath charms to soothe a savage breast.”<sup>1</sup>

American media star and medical educator of the masses, Dr. Mehmet Oz, with colleague Dr. Michael Roizen, recently wrote on the updated medical wonders of singing for adults, which include lowering blood pressure, faster recovery from strokes, repairing lung tissue, as well as producing the “bonding endorphin” oxytocin (Oz & Roizen, 2011, p. B3). Indeed, American philosopher William James is quoted as saying “I do not sing because I’m happy; I’m happy because I sing!”

In this personal narrative chapter, I tie learning through our senses, especially through music, to learning about the Earth and living on it sustainably. By teaching to both sides of the brain, we increase the chances of all students learning foundations of sustainable lifestyles. I also describe the work of other dedicated individuals who deliver the messages of sustainability through the arts, especially music.

## New Consciousness

Since the perfection of the human voice box, *circa* 50,000–10,000 BC, upright walkers with opposable thumbs have been expressing all manner of history, emotion, and lessons with music. For thousands of years, clans and cultures, tribes and nations, clubs and schools, churches, and lonely hikers have used targeted tunes and words to invoke the gods and reach deeply into the human spirit, as well as to teach, explain, soothe, and transform. Our challenges in forging a sustainable future are also inspiring new art and musical works that chronicle the movement.

The late cultural historian Thomas Berry named efforts to learn to live in harmony with Earth and all its systems “the Great Work.” He often spoke of our need to reinvent the human, thereby changing the consciousness that created this disaster (i.e., current state of the world). He wrote that having reached the end of the Cenozoic era, we are now at a fork in the road and choosing either the route of the “Technozoic” era, where we will count on technology to solve all of our problems, or the Ecozoic era, in which we will learn to live in harmony with Earth’s living systems. Which will it be? (Berry, 1999, 2006). Kolbert (2011, p.70), using a term coined by Paul Cretzen, says we are entering “a new epoch: the Anthropocene.”

Philosophers and historians of progressive movements, including Berry, note that once facts are gathered and critical information is known, it is up to the poets and playwrights, the singers and storytellers, movie makers and songwriters, and authors to carry the message of the new consciousness of our critical choices into the culture. Encouraging people to find their own Great Work enriches our diversity of learning experiences. Music, for many, is another language. We need every language available to translate our actions into a sustainable “Earthic,” or ethic for Earth, wherever possible.

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<sup>1</sup>The phrase was coined by the playwright and poet William Congreve in *The Mourning Bride*, 1697.

As an example of musicians rising to the challenge of carrying the message of new consciousness, in 2011, the Republic of Singapore held the second annual national Eco Music Challenge. In the past, the challenge garnered hundreds of original songs as entries, many with accompanying videos. Music abounds to infuse our population and our culture with creative melodies and lyrics to build a more eco-literate future. We need only open our minds and ears (National Environment Agency Singapore, 2011).

## Cataloging Sustainability-Related Music

There is an expanding body of music supporting sustainability, education, and sustainable lifestyles, with individuals and organizations grouping songs about the environment into lists and searchable databases by topic. For example, a group of professional wildlife biologists recently compiled one such list of songs that are specific to climate change. Teachers, I suspect, have been collecting and sharing lists of teaching songs at conferences since the term environmental education was coined. An Internet search finds numerous other collections of songs about ecology, environment, Earth Day, and on more limited topics like water conservation or habitat, including the following:

- The International Society for Environmental Ethics (ISEE) has a collection of music and songs related to climate change and human impact on the environment compiled by Richard Wallace of Ursinus College <http://iseethics.org/song-music/>
- Grinning Planet, Environmental Songs <http://www.grinningplanet.com/6001/environmental-songs.htm>
- Rock & Ecology: A collection of rock lyrics, articles, and view concerning ecology aspects <http://rockandecology.blogspot.com/>
- Doctor Chordate's collection of lesson and songs <http://www.tranquility.net/~scimusic/resources.html>
- Planet Patriot, Albums of Earth Songs <http://www.planetpatriot.net/albums.html>
- Musicians United to Sustain the Environment <http://www.musemusic.org>
- Eco-Music for Kids <http://www.leonardodicaprio.org/kids/music.html>

Most of this writer's work as a composer and songwriter addresses some aspect of Earth Literacy. There are many resource songs like mine that have never been commercial hits but continue in sustainability use via word of mouth, compact discs, and the Internet, including eco song listings. There are also lists that include universally known, popular songs such as Joni Mitchell's *Big Yellow Taxi*, a number of John Denver's songs, Marvin Gaye's *Mercy Me*, and many more contemporary works. Some examples of artists with multiple eco-music resources include Woody Guthrie; Pete Seeger; Peter, Paul, and Mary; John Denver; Joan Baez; Malvina Reynolds; Raffi; Green Day; Utah Phillips; Marvin Gaye; and Bruce Springsteen.

Traci Hickson and Dennis Hendricks, two West Virginia colleagues, have begun cataloging and digitizing their vast collection of more than 5,000 ecology songs,



music for Earth, and eco-tunes in a variety of genres. Many are rare; some may be the only examples of songs or variations recorded from an earlier time. Knowing the decades-old recordings from a variety of rich ethnic backgrounds would be of interest to other educators, activists, and music lovers, the collection must be lovingly protected. Database and references are available on the Web as a means of preserving these “rare species” for generations to come, enriching musical diversity, parallel to efforts to preserve and protect threatened and endangered species in the wild ([www.earthdayradio.org](http://www.earthdayradio.org)).

## Forming Community

American folk musician, songwriter, and cultural icon Pete Seeger tells audiences that singing together strengthens the bonds of community. Singing helps to inspire and educate. Whether sung in part or entirely in march time or waltz time, major or minor key, matters not. Some have sing-along choruses; others cry for joining in on just a phrase or two. Some use a call-and-response structure, inviting participation; others zip a new phrase into each verse. Who can say that multiple strands of music *do not*, in some way, enhance efforts to care for Earth? Why not encourage a note of hope, compelling the listener to add a strand of her own voice—melody or harmony—to the fabric of song, helping grow the sustainability movement exponentially.

Seeger’s insight on community may be analogous to a chemistry principle in which the stronger the bonds in any element, the more stable and resilient is that element. It does not take much of a leap to see that communities with strong bonds between and among members appear to be more stable and resilient.

We cannot deny the historic power of blended, diverse voices singing *We Shall Overcome*, *If I Had a Hammer*, *The Battle Hymn of the Republic*, *Marching to Pretoria*, and *John Henry*. Every major social movement has marched to the beat of its own songs to inspire, encourage, mourn, and celebrate. The environmental challenges of our era are no different. A body of significant musical work expressing the energy of that movement is emerging, not unlike the songs which grew out of the abolitionist, labor, women’s suffrage, the Civil Rights movement, and the Great Depression.

## Overload and Antidote

We are bombarded daily with information, statistics, advertising, news, and entertainment. Many of us are numbed from information overload. The frightening and bleak picture of inevitable ecological consequences from nineteenth-, twentieth-, and twenty-first-century technology and lifestyle keeps many individuals from scratching the surface for deeper information or, oddly enough, from taking action.

There is before us new understanding of both the task and the tools for education for sustainable development. The task of education is daunting, as each day brings new signs of unraveling in the web of life, loss or threat to keystone species, and

assaults on oceans and forests. Encouragingly, the number and diversity of instruments in our collective tool bag is growing also. Great strides are being made in educational theory and practice, brain research, community action, sustainable economics, and the sciences. Local food supply and farmers markets are a rapidly growing movement throughout North America. Often present at farmers markets, local bands or musicians perform original songs or environmental tunes, like a soundtrack supporting the action, or an artisan systems approach!

How can we best and most convincingly support the information and remedial behaviors needed to stop and reverse ecological devastation? Music can help. This lyric, drawing on the wisdom of indigenous peoples, a Motown beat, and Supremes-style backup singers, is one example of a call to action:

### **Pay Attention**

Pay attention to the trees, pay attention to the river

Pay attention to the bees...

Pay attention to the clouds, pay attention to the weather

Pay attention to everything you do to the Mother

We do not inherit the Earth from our ancestors

We are just borrowing it from our children,

Pay attention to the hills, pay attention to the water

Pay attention to the breeze...

Pay attention to the dreams, pay attention to the Wisdom

To the sisters and brother living close to the Earth

Whatever befalls the Earth befalls our sons and daughters

Whatever we do to the Earth, we do to ourselves.

Pay Attention to the birds, pay attention to the forests

Pay attention to the streams...

Pay attention to the snow, Pay attention to the glaciers

To the frostline and coastline, and coral beneath the sea

This we know: The Earth does not belong to us

We belong to the Earth.

Pay attention to the waves, pay attention to the ocean

Pay attention to the reefs.....

Pay attention to the heart, beating steady in the Mother

Or generations will pay for your ways.

We did not weave the Web of Life, we are merely a strand in it

Whatever we do to the Web, we do to ourselves.

(Rouse, 2008)<sup>2</sup>

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## **Schooling and Music**

It seems easier to find effective teaching songs for younger children than tweens and teens. As students grow older, music often falls to the bottom of the priority list in classrooms as teachers are pressed to reach testing goals and because it becomes

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more difficult to reach all the students with any one style of music as they grow and individuate. Yet, older students also respond to music's power as a teaching tool.

A few years back, an official with the Tennessee Energy Education Network requested help in evaluating a project she had developed for eighth grade students at a rural Tennessee school to teach energy conservation and new renewable energy technologies. Among the activity choices for students was writing and performing a contemporary rap or hip-hop song with an energy theme. The culminating energy fair included several debuts of creative young teenagers singing and rapping original songs based on their new knowledge of methane production, biofuels, and solar energy. I believe that their research will stay with them in a deeper way because of its combination with musical immersion.

It may seem frivolous to focus on music, generally considered entertainment, during limited teaching time. Why play or teach a song about composting while an ecosystem unravels? We face the greatest extinction rate since the loss of the dinosaurs and much of which can be attributed to the consequences of human actions and what we casually refer to as "progress." The environmental problems we face will require the work and creativity of every available individual and all of our myriad multiple talents to help enact solutions if we desire life, as we know it, to continue. So why not include music—tone, melody, harmony, and rhythm—in all its glorious combinations, in our menu of tools?

## Teaching and Learning Sustainability

The seven billion inhabitants of our planet learn and absorb information in very different ways. Educators, scientists, and human development specialists are increasingly noting the benefits of experiential learning and the critical need to accommodate diverse learning styles involving multiple intelligences. Attention is also needed in honoring the emotional and social context in which learning takes place (Gardner, 1983, 1999).

Of particular interest is the growing body of information and research concerning the affective domain (Koballa, 2006; Miller, 2005). The affective domain, the realm of feeling and values, refers to a taxonomy developed to organize levels of learning with the following attributes: receiving, responding, valuing, organizing, and characterizing as well as enjoying, conserving, respecting, and supporting. Each is presumed to build upon the previous level. Affective learning is considered to be the "heart" or sensitivity realm of learning. Historically, it is the neglected domain of learning—particularly in the sciences. Affective learning is primarily started in the right side of the brain, where emotions are engaged and the deepest level of learning occurs. Whole brain learning, that which nourishes both the left and right hemispheres of the brain, reaches learners more efficiently than a single style of instruction. It also leads learners to care and feel responsibility for the subject (Martin & Briggs, 1986).

Music, movement, and all facets of the arts are clear channels to affective learning. Earth Literacy through music is a powerful tool for sustainable change. For many professionals and activists, music in any form helps to overcome the discouragement inherent in working to resolve local and planetary problem, which can be overwhelming at times. Music, appropriate anger, and action are natural antidotes to despair. Repeating lyrics of songs that inspire and encourage, using them like a mantra, can help us reach congruence between what we teach and how we live. “Musi-versity” is a path to cultural diversity and helps refocus our worldview for sustainability.

Recent neurological studies with sensitive sensors found that music “lit up” more portions of the brain than any other activity. Music engages us in a way that only music can (Science News Staff, 2010). This modern neuroscience tells us that learning, which takes place connected to an emotion or to multiple sensory modes, occurs in a deeper, longer-lasting, more meaningful way in the affective domain of the brain.

Many of us learned our ABCs by singing them to the tune of *Twinkle, Twinkle, Little Star*, and as adults sometimes we *still* sing them under our breath while searching for a word in the dictionary. “*Twinkle, Twinkle*” is a German folk song predating records, which Mozart learned as a small child and wrote into one of his early compositions. The simple ditty has survived and thrived, reworded to become the ideal song to teach the basic building blocks of our written language to the English-speaking world—a clear example of the power of song! If we want to develop the same level of literacy for the Earth that we have achieved for reading and writing, we need to be more effective in teaching the basics—the ABCs—of ecology.

If through music and movement we are able to inspire students to see the rich biological, psychological, spiritual, and cultural value of concepts like biodiversity, carrying capacity, climate change, and the hydrologic cycle, we can reach learners in a way more likely to affect their deep understanding and behavior outside of the classroom.

### ***Hum a Little of Both Sides Now***

By teaching to both sides of the brain, we increase the chances of all students learning the foundations of sustainable lifestyles. Singing, tapping, and rapping out lines that include examples of reduce, reuse, recycle, respect for forests and waterways, and new understanding of renewable energy will create and strengthen neurological pathways for a sustainable future. These words play on in the brain beyond schooling years to remind learners of concepts and ideas critical to the future of all life on Earth.

Early twentieth-century physician and educator Maria Montessori advocated for the education of the whole child, using all the senses to immerse a child in learning. Music was a solid component of that whole child world, in a system of education, which continues to grow and flourish today (Olaf, 2010). Today, Montessori education

is emulated in myriad curricula using all the senses and generously using music in early childhood education and on up through the higher grades. She advocated hands-on activities long before formal research pointed to its effectiveness.<sup>3</sup>

### Box 20.1

My husband worked in construction for many years. As job superintendent, after working months on big building jobs—schools, factories, and industrial buildings—he would instruct workers to pick up the office work shanty on the job and turn it 180°. It served to give everyone involved a fresh perspective, another view, and often inspired new solutions to problems. “Turning the shanty” is our family term for looking with new eyes, another angle, a new perspective. Appropriate music in, out, and between class time can have the same effect because it reaches into different neuropathways of the brain.

Teachers should be encouraged to use songs, rhythms, and creative melody resources in background music, introducing a concept, or deepening and reviewing information. Teachers who are not knowledgeable about the array of sustainability music can work with music faculty to explore the lists of great recordings available, not only in popular music but also in classical, jazz, blues, opera, symphonic, Cajun, Native American, and more. Think of it as music therapy that will benefit both the students and the Earth.

Outdoor education is powerful. There are many times when we cannot be outdoors, but we can bring the outdoors inside with music, art, and visioning for when we can again be outdoors. I have been wandering meadows and mountains since I first learned the song “The Happy Wanderer” (Remember “Val-deri, Val-dera”) as a child at 4-H camp. Perhaps through our shared love of melody and harmony we can create a musical genre to coax “I-deaology” closer to “We-deaology” to better understand and share with our neighbors on our rapidly shrinking planet. Not just melody but also metaphor and simile, alliteration, and onomatopoeia, the secret magical devices of poets, urged on with major, minor, and suspended chords; melodic lifts; and descending bass lines, can connect us. Why would we not use this rich, diverse cultural vehicle we call music for its transformative and transformational lessons for the future of planet Earth?

## Molokai Music

Inspired and inspiring teachers on the island of Molokai, Hawaii, have taught me a great deal with their classroom use of music. With grant funds and inventive fundraising, pioneering teachers, Dara Lukonen and Vicki Newberry, have brought me as a songwriter on island more than once to work with their students. They

<sup>3</sup>For example, the effectiveness of hands-on activities in science education was confirmed in the 1980s (Blosser, 1985; Bredderman, 1983).

creatively weave a variety of “green” music throughout the school day. Whether by habit, training, or culture, students seem to absorb lyrical intent, musical nuance, and a sense of community as they work.

The teachers invited me to cocreate something musical and personal for the students. Working with the entire class, students shared all the things they identified as special and unique about their island’s natural history, cultural treasures, and flora and fauna that could be found nowhere else on Earth. They debated special Hawaiian words they would like to hear in a song about their island. They spoke deeply and passionately about their ancient heritage. We made lists and discussed pictures they could paint with words and melody about their home in the Pacific Ocean. Over time and across the miles between my home and theirs, we created a song celebrating the unique ecological qualities of their island, worthy of study and conservation. They have now sung “Wind, Wing and Wave” (see below) for global audiences, including the International Recycling Coalition in Tokyo. (The song title came as a suggestion from teachers because every living thing on their volcanic island got there by wind, wing, or wave.)

Like having a state song, or a college fight song, we take pride in our home through regional music. In writing lyrics with the students, I learned much about their island home from their descriptions and shining eyes. The French poet Stendhal wrote, “The purpose of home is to make the heart leap.” I could almost see hearts leap as students spoke of watching giant sea turtles swim in the moonlight. Singing of these images with pride is a powerful strategy for preserving a future for giant sea turtles.

### **Wind, Wing and Wave**

I come from a place called Moloka’i,  
Born of Pele’s fire and shaped by the sea.  
Tiny seeds dropped by a passing bird  
Brought ferns and forest, fruit and mystery.

#### *CHORUS:*

Wind, wing and wave  
We all got here the same way  
Led by spirit to this paradise.  
Hula and leis, Warm aloha is our way  
Honihoni (big kisses!) from our Moloka’i

Rhythms of the ancient tides  
Brought na kupuna (ancestors) to our sands  
In canoes from distant isles—  
New ohana to life’s circle in our land.

#### *REPEAT CHORUS*

Seacliffs rise, the highest in the world  
Watching over Kalaupapa (village) from above,  
Native birds sing their island songs  
Beside the ancient ponds we tend with love.

#### *REPEAT CHORUS*

Winds in the trees, rumble of the surf  
You can even hear the great whales breathe

Honu (turtles) swims underneath the moon  
 We will work to keep this majesty!  
*REPEAT CHORUS*

(Rouse, 2001)<sup>4</sup>

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## Power of Humor, Music

Where are we going as a species? Could it be, as Kurt Vonnegut posits, that the flaw in the human species is that everyone wants to build and no one wants to do maintenance? Will the future humanoid species be a product of our lifestyles on Earth? I think so. Will humans carry music with them on the evolutionary journey? No doubt, music in some form, I believe. In the meantime we can lift up all the principles of healthy ecosystems, sustainable living, and greater understanding of our rich surroundings and use the power of music as we create a new “Earthic” for a sustainable future.

A friend says that North America is not a melting pot, where all the cultures and flavors melt into one. He claims that we are more like a gumbo, where each ingredient and culture retains its own flavor and identity but adds to the rich complexity and makes the end product greater than the sum of its parts. Likewise, writer Barry Lopez (2001) suggests in *Arctic Dreams* that no one culture owns wisdom. This writer would add we need the wisdom and experience of every culture on the planet to be a holistic planetary community. (One of many lessons we might learn from indigenous or more Earth-literate cultures is the integration of art, music, and self-expression into every aspect of daily life.) From tribal chants honoring Earth’s wisdom to the Monty Python songbook with *Expanding Universe*, to Aaron Copeland’s symphonic Grand Canyon Suite, let us embrace the whole spectrum. Why not treat our students, children or adults, to a smorgasbord of rich, diverse music that sparks the neurons to make connections to the natural world, which might not happen with an experiment, lecture, worksheet, or field trip?

## Parting Quotes and Notes

Music playing as students enter the classroom or quietly during work time can set a positive tone if it does not distract. An underlying rhythm and melody that enhances learners’ understanding of earth science and expands their hearts for all life is the music of the ages, distant echoes of the tones that reverberated from the initial

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<sup>4</sup>Written by Joyce Johnson Rouse and the children of PRISM program of Aka’ula School, students of Ms. Dara Lukonen and Ms. Vicki Newbury. Published with the kind permission of Joyce Johnson Rouse, Rouse House Music (2001). All rights reserved.

flaring forth. It has been blossoming forth from day one, even to now, on this tiny speck of the time line of history on which we perch. So let the music play in tones and forms that catalyze actions of respect for Earth, encourage love, yes, love for our habitat. Only by that love will passion for conservation and preservation of wilderness forge on. There at the edges of wilderness and tameness is where life creeps forward in new adaptations and forms that might just survive as future specks on that time line of history.

Following are the responses of traditional and nontraditional educators invited to comment on their own experiences of using music in sustainability education:

Music stimulates the deep taproot of human passion and motivation. Hymns motivate us to reflection. Anthems motivate us to celebration. Work songs stimulate us to buckle down and do what needs to be done. We need equal parts reflection, celebration and hard work to achieve environmental sustainability. Let us therefore use music to help us get there.

—Craig Wagner, Chairman, Musicians United to Sustain the Environment (MUSE)  
([www.musemusic.org](http://www.musemusic.org))

Often the ‘message’ of my all-day programs on Earth themes is beautifully summarized in musical form, so I use CDs, usually prior to a ‘reflection period.’ Many times it has lightened a heavy day on our planet’s many challenges... to help us realize what Rabbi Heschel means when he says, “We are the cantors of the Universe.”

—Sister Paul Gonzales, retired biology professor, OH

Environmental music celebrates and appreciates connection to place and every living thing; it calls for a community of people to rise in defense of rivers, oceans, forests, and the diversity of life. Musicians from all walks of life, from Nashville to the Black Hills, from the Rock-n-Roll Hall of Fame to Pete Seeger’s Hudson River Sloop, remind us that we are not alone, many people care and are seeking solutions. This music calls us to be mindful of our own actions, to take less, destroy less, consume less, and appreciate the gifts of the earth.

—Traci Hickson and Dennis Hendricks, founders *Earth Day Every Day Radio Project*

### **Somebody’s Habitat**

A long time ago before Columbus got found  
A squirrel could run without touching the ground  
From the coast of Carolina to the Mississippi  
Just living and loving and flying through the trees  
Living and loving and high fiving in the trees

Then progress came along with axes and saws  
They cut the big timber for a pretty good cause  
Houses and churches and schools and such  
Nobody thought they were cutting too much  
Maybe it’s time to say, “Hey, baby, we’re cutting too much.”

#### *CHORUS:*

Whoa -oh! Oo-ee! That thing is more than a tree!  
Its sponge and its filter, and climate control,  
Its biodiversity and part of your soul.  
Its home and its shelter for eagles and cats.  
And we’re writing our future off on habitat.

Now the sawmills and chip mills are grinding away  
A billion tons or so every day



Clear cutting old growth in no time flat  
 To print Hollywood gossip and somebody's stats,  
 And political baloney on Habitat

Now we're grinding up little teenage trees  
 To catch a snoutful of snot when we sneeze.  
 The land is left degraded and cracked  
 And we're wrapping our burgers in habitat,  
 And blowing our noses on somebody's habitat.

*REPEAT CHORUS*

Sending holiday greetings on habitat  
 What do the eagles think of that?  
 Wiping our butt—ons off with habitat  
 Shining out booties with habitat

Credit card offers and paper sacks  
 Wally World flyers and baseball bats  
 Pallets and crates and birthday hats,  
 We're diapering our babies with Habitat  
 Diapering our babies with some other baby's habitat

Maybe it's not too late to be,  
 Living and loving in harmony  
 Instead of writing our future off on habitat.  
 We could be Lovin' our babies by saving some other babies' habitat

(Rouse, 2004)<sup>5</sup>

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## Chapter 21

# The Gladstone School District: On the Road to Education for Sustainability

Susan Olds and Brad Kuntz

*Editor's Note: This chapter presents Susan Olds' practitioner's perspective on a district-wide change process to reorient the Gladstone School District to address sustainability. Ms. Olds is a science teacher and a Teacher on Special Assignment in charge of Curriculum and Assessment Coordination.*

*Brad Kuntz, a Spanish and Environmental Leadership teacher in the District, was faculty advisor for a student-led sustainability initiative that helped launch the larger district-wide change process. His first-person description of the growth of that student-led initiative is presented in the shaded boxes.*

### So What Is the Big Deal with Sustainability?

The challenge was clear: to increase sustainable practices in our school district. But when we accepted this challenge, the obstacles became apparent almost immediately. We did not know the depth of the commitment that would be required or the direction in which to focus our efforts. But our community, Gladstone, Oregon, is not a community to back down from a challenge. We are a small district with many strengths, and we knew we wanted to keep our school district at the forefront of technology and sustainable practices.

Our district-wide change process began with a successful student-led sustainability, directed by Brad Kuntz, described in Box 21.1. Following the success of this student-led initiative, the idea for broader curricular changes came about when our school superintendent, Bob Stewart, attended a 2008 Sustainable Curriculum Conference in Canada. The intent of this conference was to expose a group of educational

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S. Olds (✉) • B. Kuntz  
Gladstone School District, Portland, OR, USA  
e-mail: oldss@gladstone.k12.or.us; kuntzb@gladstone.k12.or.us

professionals at the secondary and university level to concepts related to sustainability and school curriculum. He returned from this conference with a new dedication to create a curriculum that would span grades K-12 and cover areas of global sustainability, not just “green” concepts. He initiated a project to bring this innovative idea to our district and move our current curriculum forward to address the needs of a changing population and global community.

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**Box 21.1** Growing a Student-Led Movement

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Brad Kuntz

In 2007, as advisor of the National Honor Society (NHS), I helped a team of dedicated and talented students interested in bringing sustainability to Gladstone. We investigated the school’s current use of resources, recycling and waste systems, teachers’ and students’ practices, and school and district policies. We also took a baseline measurement and set goals. Next, the students and I began talking to the appropriate audiences to make change. We met with school administrators, presented to the student body in every second-period class school-wide, met with the school board and district leadership, and presented at a staff meeting at the high school. Finally, we proposed specific changes tailored to each audience and sparked a movement that was still thriving at the time of this writing. The grass roots movement begun in 2007 at the student level continued to grow. After helping the National Honor Society start the environmental movement, I created a new club open to the entire school, called the Green School Club. The new club was extremely popular as soon as it began. I continued to advise NHS but also took on the leadership of the new environmental club as well. Due to an increasing level of student energy around the topic of sustainability, I then began teaching a class called Environmental Leadership using a curriculum that I designed. This is a project-based, student-led class that, along with NHS and the Green School Club, continues to foster environmental stewardship in the culture of the Gladstone School District.

The first goal of the project was to assemble a team of teachers and create a curriculum that addresses sustainability in grades K-12 while also addressing some of the other operations in the district. Currently, the curriculum in our district is based on state-mandated academic content standards (Oregon Educational Act for the 21st Century, 2009) and leaves little room for additions. Therefore, we initially chose to look at some of the current practices that teachers were using rather than add more items to the existing curriculum. Our hope for this ongoing project was that our students would begin to understand their place in a local and global community and that all aspects of their lives would be thought about in a sustainable way.

## **A Description of the Gladstone School District and Community**

The Gladstone School District is located about 15 miles southeast of downtown Portland, Oregon. The district includes the Gladstone Center for Children and Families, the John Wetten Elementary School, Kraxberger Middle School, and Gladstone High School. The city of Gladstone is an area where available land for building new homes is scarce; it is surrounded by other small towns, so there is no outward development. There has been a 6.24% growth over the last few years and the population as of 2009 is approximately 12,152 people. According to 2010 census data, approximately 88% of people in Gladstone identify themselves as White, 2% as Black, 7.5% as Hispanic, 1% as American Indian, and 3% as Asian. Approximately 13% of the residents of Gladstone would be considered poor according to federal poverty guidelines.

Because the students in the district are influenced by the community in which they live, it is important to think about the local businesses and other organizations with which they come into contact on a regular basis. Gladstone has a few local eateries and several small businesses, such as insurance agencies and carpenters. There are six churches from various Christian traditions, but no other religious buildings. It has a small fire department and police station but relies on Clackamas County for other services. The city has a very active Senior Center that maintains a busy schedule of recreational and enrichment activities such as pancake breakfasts, book groups, weekly bridge and pinochle games, exercise programs, classes, and shopping trips. Many of the children who attend our schools are members of families that lived in the Gladstone area for several generations, and it is common for students to go through grades K-12 with friends they have had since birth.

A major event occurred in Gladstone that preceded and paralleled the curricular changes described in this chapter. In 2006, the voters approved a \$40 million municipal bond that funded upgrades to all the schools in the district, in addition to a new Applied Science and Technology Center at Gladstone High School. This building is a state-of-the-art facility that addresses the district goals of bringing more technology opportunities to students as well as integrating sustainable energy within the school through use of roof solar panels and wind energy. The bond also helped support the construction of the Gladstone Center for Children and Families (GCCF) in a renovated grocery store in the center of the city. The GCCF has developed partnerships with organizations such as Head Start and Healthy Start from around the Portland, Oregon, area. These two facilities are examples of the Gladstone community coming together to provide progressive education for our students, regardless of the small size of the city.

In addition to this early childhood center, the Gladstone Health Clinic and a relief nursery, Family Stepping Stones, have been created adjacent to the GCCF.

These facilities integrate our sustainability goals of making decisions in all aspects of education that model the concept of “long-term effects on future generations.” We believe that what we teach our small student body makes a difference in their lives in an immediate sense but should also teach them to make thoughtful decisions that will have an impact on their own long-term futures as well as their children’s futures.

## **What Is the Problem and Why Might It Exist?**

The nature of the district-wide sustainability venture did not involve a problem to solve, but more of a direction to explore. As part of my initial administrative licensure program at Portland State University, I was required to complete an Educational Leadership Project. This occurred at the same time our superintendent wanted to begin the process of integrating sustainability into our district policies, operations, and curriculum. Other staff members were exploring other areas of sustainability, such as our energy production, but I wanted to concentrate on what sustainability would look like when included in classrooms. Therefore, my role and tasks involved studying curriculum. I looked for opportunities to inform the professional staff of the different facets of sustainability and help them to include these concepts in their lessons as much as possible.

I visited each school in the district and discussed the three interconnected areas of sustainability—social equity, economics, and environment—and brainstormed with the staff ways they could include these areas in their lessons. Most teachers were very receptive to these ideas and were supportive of our district movement toward sustainability. When problems did arise, they were predominantly based on a resistance to change among some staff members. A number of teachers were concerned that the existing curriculum, based on state academic standards, might be replaced, and they were worried that scores on state-mandated tests would be negatively affected.

However, far from having a negative impact on test scores, I believed that the movement could help improve test results. If students saw a personal connection to a curriculum involving issues that directly affected their own lives, perhaps they would make a deeper commitment to their own education. I began asking myself what it would take for students of all ages to consider issues of sustainability and make personal changes to live more sustainably. I wanted to see if living more sustainably would impact their education.

The concepts of social equity knows no boundaries, and economics is an issue that can be taught in any school, so I did not believe that the fact that Gladstone was a community with few resources would affect students’ understanding of sustainability. The Gladstone School District was already modeling the importance of sustainability because the district had its own recycling program and there was an active Green Schools Club at the high school (Box [21.2](#)).

**Box 21.2** Creating Personally Relevant Learning Opportunities Through Sustainability Projects

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Brad Kuntz

Through the National Honor Society initiative, the Green School Club, and the Environmental Leadership class, students were involved in hands-on approaches to lessening their negative impact on the environment. The guiding principle for both the class and club was finding projects that create a significant and lasting impact on the school and/or community in relation to the environment. This guiding principle was purposefully broad. It gave students an opportunity to explore their interests, take ownership over their own learning, and served to increase student motivation. Students were encouraged to take on projects that are directly related to their interests or solve problems that are of greatest concern to them. A student interested in politics might meet with the school board, city council, or other officials to discuss policy changes pertaining to sustainability. A student interested in sports might examine the waste streams in the various courts and fields on campus, observe spectator and athlete behavior, and then recommend changes that could decrease the footprint of the sports programs. A student interested in technology might create a Web page or develop a campaign to promote electronics recycling.

I believe that allowing students to follow their interests can motivate them to excel in independent or small group environments. I use predesigned projects and I also encourage students to design their own projects based on their level of comfort with project-based learning. Some students may wish to select from a list of projects provided by the instructor, while others may design their own. Students decide a course of action to take and develop a plan to reach their goals. Along the way, students conduct research, work across the curriculum, problem-solve, and think critically. Once students have selected their projects, I serve only as a guide and advisor. Indeed, I may not be knowledgeable in the specific areas projects cover and will learn from and beside the students.

As a starting point, I began asking other teachers about their understanding of sustainability. I also began looking at what was already in place concerning sustainability. To assess the viability of asking teachers to change the way they taught, I observed teachers at staff meetings when their principal would bring up additional items to teach, such as the required Constitution Day information, and I discussed within small groups the ease of changing lesson plans to make such changes.

I quickly learned that many teachers, predominantly the “old timers,” did not want to change their lessons because what they were already doing worked well for them and a need for change was not obvious. Some teachers indicated that they thought the

ideas of sustainability were best taught in a science classroom and they saw no place for it in other subjects. The social studies department seemed to express the least resistance because they already covered topics of social equity. However, they did connect these ideas to the topic of sustainability so, again, I saw my role as broadening the scope of what these teachers understood about the nature of sustainability.

## **Sustainability Committee and the Growth of New Projects**

Another step in reorienting the district to address sustainability was the creation of a Sustainability Committee. This committee began with the goal of introducing sustainability to the curriculum. Anyone interested in being a part of this committee was encouraged to attend, and we began with administrators and teachers from various levels and content areas. The goal was to work within our own “sphere of influence,” that is, to start exploring what it means to incorporate sustainability into our classroom and share our ideas with our peers and anyone else with whom we worked closely. As the move to sustainability gained momentum in the district, we began seeking out new avenues in which people could become involved. This resulted in a number of projects around the district.

The Culinary Arts program began exploring the farm-to-table movement, which focuses on producing and consuming food locally. The farm-to-table movement advocates sustainable practices throughout the entire production-consumption chain from farmer to consumer. This student group communicated very clearly the importance of sustainability when they catered for our school district events. Paper products were replaced with washable plates, cups, and silverware, and meals often were served “family style”—individuals serve themselves from serving dishes at the table instead of being given a prepared plate by a server.

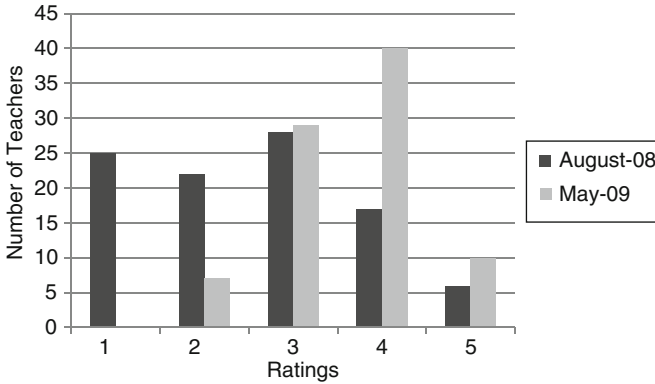
## **Defining Sustainability and Coming to a Common Understanding**

As I began the study of curriculum integration with teachers, one of the first obstacles I faced was ensuring a common understanding among the staff. We all recognized that we could not teach our students about sustainability concepts if we all had a different understanding.

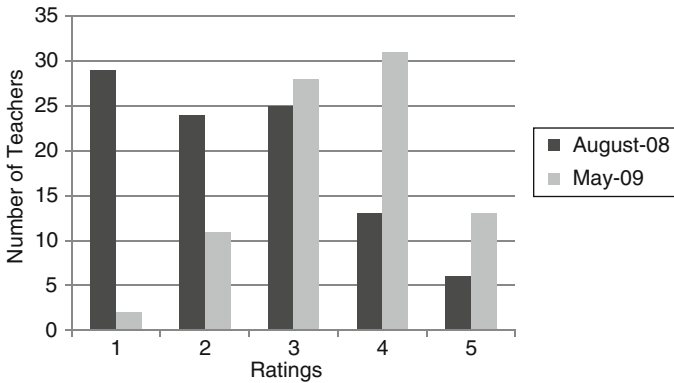
I began by gathering information from the staff concerning their thoughts on what sustainability meant. Using five statements about sustainability, I asked the staff to rate themselves on a scale of 1–5 (1=strongly disagree and 5=strongly agree). The statements were:

1. My understanding of sustainability is comprehensive and complete.
2. I can easily incorporate sustainable concepts into my lesson plans with the information I currently have.





**Fig. 21.1** Teacher responses to the statement “My understanding of sustainability is comprehensive and complete”

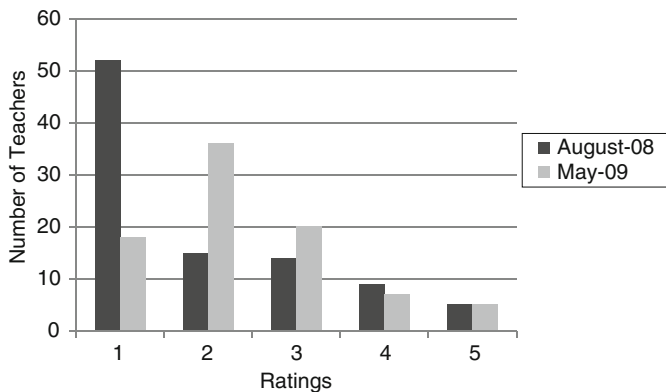


**Fig. 21.2** Teacher responses to the statement “I can easily incorporate sustainable concepts into my lesson plans with the information I currently have”

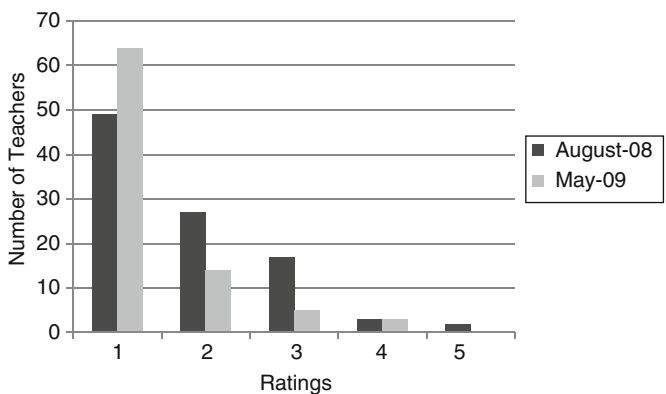
3. I research what current information says about sustainability in order to use this information in my lessons.
4. The concepts of sustainability are best taught within Science curriculum and don't apply to other subjects.
5. I would use premade lesson plans that involve sustainability if they also taught required benchmarks.

I posed these statements in August 2008 and again in May 2009 to see if their understanding had changed over the course of a single school year. The results are shown in Figs. 21.1, 21.2, 21.3, 21.4, and 21.5. The graphics compare teacher ratings of agreement with each statement in August 2008 and their ratings in May 2009.

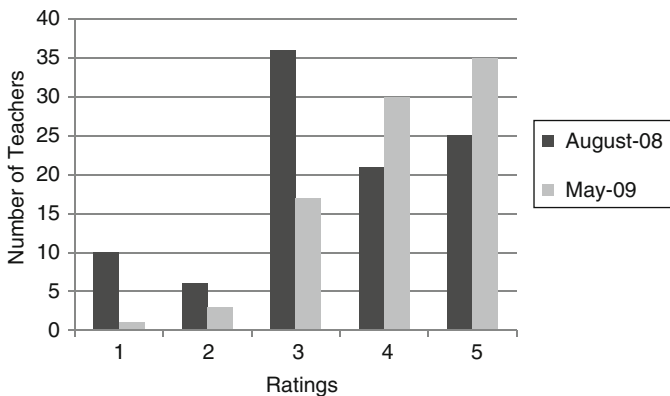
The results were very positive, specifically in the first two statements, and showed a good deal of growth and a change in understanding. In addition to these statements, I asked the staff to explain what they thought sustainability



**Fig. 21.3** Teacher responses to the statement “I research what current information says about sustainability in order to use this information in my lessons”



**Fig. 21.4** Teacher responses to the statement “The concepts of sustainability are best taught within science curriculum and don't apply to other subjects”



**Fig. 21.5** Teacher responses to the statement “I would use premade lesson plans that involve sustainability if they also taught required benchmarks”

meant. In August 2008, overwhelmingly they repeated the words “carbon footprint” and “reduce, reuse, and recycle.” This was a clear indication that they viewed sustainability as primarily an environmental issue; however, that mindset had changed by May 2009.

## **The How-To’s of Integration and Accountability**

My question then became “What do I need to do to help clear up misunderstandings about sustainability and assist staff in incorporating sustainability concepts within their preexisting curriculum?” The data showed that teachers were willing to explore these concepts and would even use predesigned curriculum if they were taught how to do so. So I asked our Sustainability Committee, which comprises teachers, other staff members, and administrators, to learn about these ideas and take this new knowledge back to their individual schools. This proved time-consuming since all members of this team were teachers and administrators (i.e., very busy educators). The desire was there, but time to explore lessons and make changes was at a minimum. Another challenge we discovered as the school year progressed was lack of momentum. Many staff members wanted to make changes; however, they felt like sustainability was a potential “add-on” to an already full curriculum, and they did not want to participate. We found that those teachers who explored how sustainability could be incorporated within their classrooms also held sustainable practices in high regard in their personal lives.

To add validity to our sustainable goals, we asked the Gladstone School Board to agree on a sustainability goal and incorporate that within the district’s mission statement. This proved helpful as each educator had to create three professional goals at the beginning of the year, one of which has to be a district goal. When sustainability was included in the district mission statement, staff members had a sustainable goal to reach toward and a sense of accountability.

I set my goals toward educating any and all willing to learn quick and simple methods to incorporate sustainability into the standards already being taught as well as to encourage exploration of new units to teach. I created a PowerPoint presentation that explained the three parts of sustainability in a Venn diagram and gave several examples of lessons that explored the social equity and economic issues in addition to environmental impact. I presented these examples to all the schools in the district, and eventually this became part of a larger presentation made by members of the Gladstone School District, which described sustainability efforts within the school district. The team of contributors to this comprehensive presentation began telling the Gladstone story to all who would listen. We found ourselves sharing our story at the Oregon School Board Association annual meeting and the North American Association for Environmental Education (NAAEE) annual conference.

## How Does Education for Sustainability Help Bridge Achievement Gaps?

The goal of infusing sustainability into the curriculum is to teach our students about the impact they have on their environment as well as future generations. While these goals are noble, any administrative team wants to know how this curricular change will help bridge the achievement gap. Answering this question became important in driving momentum. While Oregon does not have specific sustainability “sections” in their required state standards, there are topics and/or words that relate to sustainability. For example, Oregon Science standard—*H.2E.4 Evaluate the impact of human activities on environmental quality and the sustainability of Earth systems. Describe how environmental factors influence resource management*—lends itself well to teaching sustainability.

However, the integration of sustainability topics does not have to be in response to a standard. We teach sustainability because it is the right thing to do to prepare students to be thoughtful consumers as adults. In teaching students to be concerned with other people as well as their own impact on their communities, both small and large, we prepare them to be better writers, better readers, and better thinkers. These all have an effect on how they learn, thus impacting overall achievement.

We do not have specific current data on the classrooms that have incorporated sustainability within curriculum or how test scores have been affected. However, we do have qualitative data on how our students have become better thinkers. Teachers, who have made the decision to think and teach sustainably, report how their students have improved as thinkers. For example, Brad Kuntz has seen his students in Environmental Leadership become better problem solvers, thoughtful decision makers, and stronger communicators when they were tasked with solving problems in and around the school, such as the composting issue (Box 21.3).

### **Box 21.3** Rigorous Educational Experiences Through Project-Based Learning

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Brad Kuntz

A recently completed project from Environmental Leadership illustrates how a project can provide a group of students a rigorous, beneficial educational experience. After completing a waste audit in the cafeteria to determine the percentage of recyclable garbage, the students found that a large percentage of the waste was from food. Upon further investigation, the team realized this amount of waste created a startlingly large ecological footprint. Their research showed them that after a journey of more than 100 miles to the landfill using trucks with an average of 5.5 miles per gallon, food waste decomposition resulted in release of a number of destructive greenhouse gases.

On the basis of these data, the students decided to start a campus food waste vermicomposting system. This project entailed submitting an application

(continued)

**Box 21.3** (continued)

for a grant for the necessary materials, researching composting options, meeting with the administration, seeking the advice of local experts, designing and building the composting bins, experimenting with various food collection systems, and setting up a rotating volunteer system of caring for the compost. Each component of this project provided real-world situations and opportunities for student growth.

Once the project was completed, the students could see that their actions can make a difference. They realized their project could continue for years and has the potential for a significant reduction in greenhouse gas emissions while at the same time shifting the mindset of their fellow classmates. Many other projects were similarly visible and served to educate the student body and community members about decreasing their impacts on the environment. Over the 5 years that this class and club have been in existence, the students and their projects have had a significant impact upon the culture of the school and community. Students, staff, and community members have welcomed this change and are proud of the fact that they belong to a community that is paying closer attention to the consequences of their own actions.

Similarly, one of our business teachers witnessed his students become better writers in his class when they had to learn how to make a presentation and choose a sustainable topic to write about and present, such as the issues surrounding recycling of electronic parts.

## Keeping the Momentum Going

The task of keeping excitement and curiosity moving forward has been a challenge. As I was in my administrative licensure program, it was easier to keep the conversations going with staff members since I was working on a specific project that was about sustainable curriculum development. As the year ended and a new school year began, it was more difficult to spend time training teachers and visiting staff to help if there were questions. The group of teachers that were very motivated dwindled to about six from three of the four buildings. While we met as a group periodically, it was apparent that we became teachers working “as if on an island unto ourselves.”

I have seen, however, an upward swing in interest; more teachers are engaging with activities on their own to incorporate sustainability in some way. An elementary school teacher has been instrumental in bringing composting to the elementary school. The middle school has a class that is in charge of their recycling program, and the kindergarten has started growing vegetables in the school garden. All these activities, while seemingly focused primarily on environmental issues, are opportunities for these teachers to model social sustainability and to teach economic development.

One key point in keeping the momentum going is to look at sustainability through all three lenses and put words to actions that we normally perform. For instance, at the elementary level, holding the door open for another student or saying “thank you” is a way of modeling social equity. Deciding as a class what to do with grant money is teaching economic sustainability. At the high school level, our students are making choices on projects that they are interested in that make a difference. The Environmental Leadership class uses a project-based learning approach, so it is not difficult for the teacher to keep the students motivated when they are making the choices, doing the research, and directing the projects.

What can really keep the momentum going? Seeing finished projects and the sense of accomplishment on the faces of our students when they have contributed to their school seems to be the greatest motivator.

## **Future Plans**

Our efforts to reorient the Gladstone School District to address sustainability are far from complete. We are still in the process of obtaining solar panels on our schools and continuing the partnerships that will bring this goal to fruition. Our goal is to generate the power our Applied Science and Technology Center needs within 3 years. We intend to have monitors in our school that allow us to see the energy being generated and to use this information in our science and mathematics classes. We are continuing the development of the Gladstone High School courtyard. When it is finished, it will be a space where students will be able to make connections with each other. It is handmade by the Gladstone students and community members and promotes a sense of pride in the use of recycled materials and a garden that provides herbs for the culinary program. It will model recycling of water as we collect the rainwater for use on the vertical garden.

Other projects are under development as well. Specifically, the food services program is undertaking a cost analysis of disposable plates versus washing plastic trays. Our landscaping crew is looking at the chemical products (e.g., fertilizers) used on the grounds, and our administrative staff even performed a study on engine idling in front of our schools to study carbon emissions in waiting vehicles. This study led to a “No Idling” policy in our district, with signs posted in our parking lots. The Gladstone Health Clinic is continuing to offer services for local children, and the relief nursery is now open to receive families that need a little extra support.

## **Creating a Goal: What Is Important to Our School and Our Community?**

I believe a dynamic curriculum will always be a work in progress. While Oregon state academic standards for education can change very little with the exception of wording and minor emphasis changes, our students change quickly as do our

technology needs. Our staff works unceasingly to deliver an education that is up to date using current methods and best practices. Conversations will continue in areas of what is best for students, proficiency-based education, and how to incorporate reading and writing in all subject areas. A path we will continue to develop will be how to incorporate sustainability within our curriculum as well as new ways to teach required standards in a sustainable way.

Continued involvement with our community is essential as the Gladstone way of development always includes our parents, our city, and our larger community. Public participation is essential to the Gladstone way of doing business. Senior educational administrators consult with parents, the city, governmental agencies, and the larger community when contemplating change. The entire Gladstone staff strongly believes that students need to be prepared to live in a society that is familiar, like Gladstone, as well as be prepared to adapt to and thrive in new situations and environments.

The only way to continually move forward is to consistently communicate and seek out new knowledge. This must be coupled with a desire to explore and integrate. We all must rely on each other as well as our own interests to continue developing exciting curriculum that prepares students to live in a world where they see interconnectedness and value in what they will contribute as individuals. We, as a staff, are likely to continue to share ideas, seek out grants to fund projects that are important for our sustainable goals, and to reflect on whether our efforts are making an impact on students' lives.

## Reference

Oregon Educational Act for the 21st Century, Oregon Revised Statute 329.045 (2009).

# Chapter 22

## A Canadian School Experience

Curt Belton

### A Critical Foundation

As the principal of a small elementary school in a suburban setting in Canada, I feel the pressures of the crowded curriculum, assessment, budget restraint, and whichever initiatives are most important to my superiors at the moment. While I will always make sure to keep the delicate balance of fulfilling my responsibilities in these areas, I feel it is my moral and social responsibility to promote education for sustainable development within my school community and beyond. When I look at the pervasive negative impact of the human species on the environment as well as the social and economic inequity within my city and worldwide coupled with the global assault on indigenous cultures, I feel compelled as an educator and as a citizen to keep ESD high on the agenda. To me, teaching children about sustainable development is a necessary foundation for developing citizenship. Just as public education is a foundation for Canadian democracy, understanding the concept of sustainability and developing critical thinking are foundational for developing meaningful citizenship skills.

### Starting the Journey of Understanding

As a school principal, my work in ESD started at my previous school, Clifton Elementary in Winnipeg, Manitoba, where the staff and community were supportive of initiatives in the areas of healthy living, social justice, and school ground greening. At Clifton, in collaboration with parents, I was able to obtain a grant for school

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C. Belton (✉)

Rockwood School, The Winnipeg School Division, Winnipeg, MB, Canada  
e-mail: cbelton@wsd1.org



ground beautification. This led to the development of a school “Green Team” of students who took care of the new gardens. Because of the nature of the grant and the timelines involved, students were not involved in the design phase, but every classroom was educated about the gardens and types of plants, and students could volunteer to work on the Green Team to care for the gardens. The design of the gardens even included bocce courts, which seemed appropriate, as there were a large number of families with Italian heritage living in the neighborhood. I was easily able to enlist the help of families to care for the gardens over the summer, weeding and watering. It was truly a community project.

Projects in the area of healthy living were also very well received at Clifton. One of the initiatives included holding a forum on healthy living at the time when it was first being reported that children in Canada were having high rates of obesity and diabetes and were becoming less fit. The panelists included the Provincial Minister of Healthy Living, a school trustee, and a representative from Sport Manitoba. A topic of great concern to parents was that of healthy eating; this led us to do our best as a school to educate students about nutritious lunches and healthy foods. A natural connection to this was promoting litter-less lunches; I saw a strong correlation between healthy food choices and litter-less lunches.

Clifton School was also active in the social realm, collecting food items for hampers during the Holiday Season and collecting money for relief during specific events like the Boxing Day tsunami in the Indian Ocean in 2004. In the latter, students approached me to suggest that we raise money; this is an example of the significance of student voice.

All the initiatives above fall into the realm of ESD; however, I was not using that framework at the time to give a broader context to the work.

One of the things that the staff did at Clifton was to work on the concept of citizenship; to do this, we created the “Clifton Kid” model. We asked students, parents, and staff to identify the most important personal traits they believed that our students should exhibit. Among the agreed traits were kindness and helpfulness. Using this model, the staff taught the students about citizenship. This was really the start of my journey into ESD, which has become a passion for me, or perhaps more correctly stated, a mission.

## **Transferring to Rockwood School**

When I moved to my present school, Rockwood Elementary, the seeds had already been sown to be able to cultivate a culture of sustainability at the school. The parent community had already undertaken an ambitious project of school ground greening including garden boxes, and the school had teachers who were working on both social and environmental issues. Rockwood also separated some wastes and recycled. Beyond that, many staff and community members were interested in promoting “Green” initiatives, and it was stated that Rockwood was striving to become a “Green School.” For me, this was an opportunity to continue my lifelong interest of promoting environmental and social responsibility.

One of the first ESD events that I experienced at Rockwood was an “I Walk to School” day in October where we did some low-key promotion and took the whole school on a neighborhood walk to celebrate Active Transportation. I thought it best to act more as an observer in my first year and support the initiatives that were already in place. I believed that it was critical for me to understand the culture of the school; hear the viewpoints of the staff, students, and parents; and gain the trust of the community before I put my own ideas forward or embark on new initiatives.

As spring approached that first year, one of the initiatives that seemed to need a boost was the gardens. There was some disconnect between the expectations of the parents who had worked so hard to construct a garden box for each class and the school staff who were responsible for planting and maintaining the garden boxes with their students. We were able to reach an understanding that each class would plant flowers in the boxes, and it became clear that in the future more support would need to be given to the staff. In this example, not everyone was in agreement about this project, and some people needed help to increase their level of comfort with gardening. The students loved the garden boxes right from the start, and their sense of wonder could be seen as the plants grew and as insects visited.

## Understanding ESD

To learn more about sustainability, I enrolled in a Masters of Environment program through the Environmental Conservation Lab at the University of Manitoba. My initial topic was the school ground greening. I began reading about ESD, environmental education, and the discourse about which approach would be more valuable. I began to study the Manitoba Education document *Education for a Sustainable Future* (Manitoba Education, 2000), along with readings from UNESCO and other sources. These readings gave a context to the work that I was trying to do and furthered my understanding of ESD.

Beginning to understand the three-pillar framework of ESD helped me to provide a structure to the work I wanted to undertake at Rockwood School. I also realized that it was important to have a committee in place to support ESD and look at ESD from a whole-school perspective. If ESD were to become a meaningful part of the education of all students at Rockwood School, it would need to be planned, agreed upon, and approached in a systematic manner. It became apparent that there was more to becoming a “Green” school than I first understood.

## Developing a School Culture of ESD

Over the years, ESD has become a part of the culture of our school and often became the topic of whole-school assemblies. In one example, I taught students about migrating birds and how to recognize them. Then, with student participation, we set up winter bird-feeding stations at strategic locations and provided bird

identification books. I challenged the students to look for these migrating birds both at school and at home. The school newsletter became part of the community education process as I tried to keep parents informed about ESD activities and events. The aims were to educate about the great bird migrations and to develop an interest within the school community in our wild birds and their conservation.

On the social front, Rockwood already had a strong relationship with a grass roots organization called Canadians Helping Kids in Vietnam (CHKV) that builds schools and supports individual families. Stemming from the work of teacher Jennifer Elliott, the school had been involved with read-a-thons to raise money. In fact, over the years, it could be said that Rockwood raised enough money to build a school on its own.

In my first year involved with this project, Jennifer's class held a "kickoff" assembly to inform the whole school about CHKV and Vietnam. This assembly included both the natural beauty of this country and the issues associated with poverty. One evening, the school held a dinner to celebrate the Vietnamese New Year and to highlight our fund-raising efforts. At this dinner, which was attended by Rockwood families and staff, CHKV informed the whole community about Vietnam, their culture, living conditions, and the significance of the work of the organization.

The community spirit generated through this project was very strong and led to Rockwood School sponsoring a family in Vietnam on an ongoing basis, in addition to raising money for building schools. The small monthly donation doubled this family's income, which allowed all of their children to go to school.

The realization that the CHKV initiative at Rockwood was not just about the social pillar of sustainability became clearer. We saw that economics played a part in preventing children from attending school. The seeds of ESD were starting to take root as we slowly deepened our understanding about our projects and saw the connection between the social, economic, and environmental pillars.

## **The Influence of UNESCO**

In March 2009, I had the opportunity to attend the UNESCO World Conference for ESD in Bonn Germany along with my colleague Jan Zamparutti from the superintendents' department. One thousand representatives from 150 countries were together for three very intense days evaluating the progress of the Decade of ESD at its midpoint. No one could have left this gathering without feeling inspired to go home and do his or her best to promote ESD and further this work. The Bonn Declaration (UNESCO, 2009) was a call for action and, for me, this meant that I would set aside my research on school ground greening to put my full efforts into ESD. It was a difficult decision, but I knew it was the right direction to take.

In Manitoba, schools are administered through a series of school divisions, each having its own elected board and a separate administrative structure. As Jan and I made our journey back home from Bonn, we knew that there was a lot of work to be

done in the Winnipeg School Division to move along the path set out by UNESCO for the Decade of ESD, and we made specific plans as to how we could further this important agenda. Some of our goals included:

- Forming a broad-based divisional ESD committee,
- Drafting terms of reference/guiding principles,
- Working on provincial committees, and
- Connecting with schools and educators internationally.

In fact, we were able to accomplish all of these goals. We also realized that this was just the beginning of the journey to sustainability for our school division. In my report to the school board after attending the UNESCO conference, I highlighted what I believed were the most salient points of the Bonn Declaration. These were:

- Persistent poverty and inequity negatively affect the prospect of peace.
- Western lifestyles and unsustainable development are huge problems but can be addressed.
- There is huge variation in the proliferation of unsustainable development, and nations need to cooperate and educate their citizens.
- Education for all is a key tenet of ESD.
- Through lifelong learning, we can achieve lifestyles that are based on economic and social justice and show respect for all life forms.
- This is a time for action—the need is urgent (UNESCO, 2009).

The question became how to take these broad and critical concepts and apply them at a school level. One of the ideas that I came across when reading the work of David Sobel (1996) that we should not be putting the burden of the world on young learners and expecting them to solve the problems created by previous generations. To me, it seemed that adults needed to understand the broad concepts while introducing students to sustainable development at a developmentally appropriate level. As a staff, we would need to deepen the understanding of the concept of ESD and also that of sustainable living.

## Professional Development in ESD

To accomplish this, I set out a series of half-day workshops for the staff so that all members would have the same general understanding of ESD. For two of the workshops, I was fortunate to be able to arrange for all staff to attend. If we were to move on a journey of becoming a sustainable school, all staff needed to be involved. For the first workshop, we invited a representative from the International Institute for Sustainable Development (IISD) to discuss the work of the institute and her own involvement with ESD. This was followed with a general discussion amongst staff to help build their own personal understanding of the concept of ESD.

The second workshop was for teachers only and was based on reviewing the provincial document, *Education for a Sustainable Future* (Manitoba Education,

2000), and looking at the curricular connections for ESD on the Manitoba Education Web site. We looked at the sustainable life practices in the provincial document, which are divided up into activating, acquiring, and applying. As an elementary school, we felt that we would be looking at the first two stages. Teachers made commitments as to what they would try before the end of the year and some for collaboration. For example, one of the primary classes teamed up with an intermediate class and measured and analyzed the waste from the lunch program. Afterward, they reported their findings to the whole school.

The curricular connections on the Manitoba Education Web site were useful in pointing out that we were already engaged in ESD within the curriculum; it was not something brand new being imposed on top of what we were already teaching.

Our third workshop focused on a personal understanding of ESD and sustainability and once again involved the whole staff. In hindsight, I believe that I should have done this workshop first as I believe people need to have the personal understanding before moving forward. In this workshop, we looked at excerpts of a video from the Sustainability and Education Academy featuring Charles Hopkins (Sustainability and Education Academy, 2008). In the video, Charles uses some compelling examples of the need for ESD such as showing the unimaginable global depletion of fish stocks and disturbing images of how we manage e-waste by exporting it to the developing world. These examples really hit home with the staff and sparked meaningful discussions. One of the other resources I used was the popular video *The Story of Stuff* (Herrera & The Tides Foundation, 2007) that discusses the disturbing impacts of the Western consumer lifestyle on our planet and its people. Although many of the staff members were familiar with the concepts, watching and discussing the video as a group was a very powerful experience. I believe that this workshop truly brought across the concept of sustainable development and the urgent need for ESD.

As we continued on our journey of understanding as a school community, other opportunities to expand our participation in, and understanding of, ESD just seemed to present themselves naturally. We were able to see connections that were not obvious to us previously.

## **A School for Trout**

One interesting project that we embarked upon was a trout-hatching program where students with behavioral challenges in a specialized class became the stewards of these delicate creatures. The goal of the program was to raise the awareness of water quality issues, highlight the lifecycle of the fish, teach responsibility, and build empathy for the fish as these students cared for their well-being. The idea came from the Fish Friends programs that can be found widely on the Internet, but would not have been possible without the assistance of the Fisheries Branch of the Manitoba Government. The students in this class were not only responsible for the fish but also for teaching the other students about what they were doing. Updates were provided at school assemblies and in the school newsletter.

This project required a good understanding of both science and technology on the part of the classroom teacher, Patrick Hannah. His receptiveness to the project, along with his skills as a science teacher, was a crucial ingredient to the success of this program. The water temperature, oxygen, and pH levels were monitored electronically by the students, and in the initial stages, the eggs had to be kept in the dark. Eventually, the cover was removed, and the students very carefully fed the trout. Once the trout have passed from egg to alevin to fry, we released them into stocked trout waters under the watchful eye of the fisheries staff.

The trout project is an example of an opportunity that was presented to the right teacher who was able to take the initiative and run with it. Although on the surface it appears to be an environmental project, the dimensions of allowing the students in this specialized class to show leadership and to teach the other students about their work added depth. It provided more opportunities for social interaction between class members and other students as they stopped by informally to see the trout.

## **Promoting Active Transportation**

Active transportation (AT) was another area where Rockwood School had already started to work prior to my arrival. We had the annual “I Walk to School” event, and there was even a “Walking School Bus” organized by parents. Then, some teachers came up with the idea of a bicycle education program.

In our first year, we enlisted the services of Manitoba Public Insurance whose staff members came out to the school and ran a “bike rodeo.” The students had safety instruction in the morning, and in collaboration with an army of parent volunteers, students were able to practice what they had learned on a neighborhood ride. All students needed to demonstrate that they were capable of riding safely and were required to wear a bike helmet for the ride. An alternative activity was available for those students who were not able to ride.

After organizing this activity for a couple of years, it became obvious that we needed to do more for the older students. This came in the form of having a qualified bike mechanic do a presentation focusing on making bikes safe. In addition to receiving safety instruction, the older students checked the mechanical condition of their bikes, pumped up tires as needed, and took a longer ride to a local nature education center.

This activity took the involvement of every staff member and at least a dozen parent volunteers willing to ride bicycles. Our secretary played an important role keeping us in touch with each other as required, and our custodian was on call to pick up any bikes and riders if there was an emergency. Not only were we working on AT and healthy living but the community-building aspect was important as well.

We have also highlighted Bike to Work Day and Clean Air Day and tried to accommodate those students who choose to roll to school on skateboards, scooters, and roller blades. It took a little bit of creative thinking to make sure that these AT equipment were stored safely at school, but it is important to support the students’ efforts by making it possible for them to come to school in a sustainable manner.

A question that arises as I look at these initiatives at school is how do I show leadership as the school principal? What would it mean, if the staff and I are promoting active transportation at our school, if I were to drive up as the single occupant in a gas-guzzling vehicle? I believe that if I am to have credibility within the school community I need to model the behaviors that we are promoting. For my part, I cycle, take public transit, or carpool whenever possible. As a school leader, I need to demonstrate that I am prepared to “walk the talk.” To me, this is ethical leadership. Practicing what I preach needs to extend to as many aspects of my school day as possible including bringing a litter-less lunch of healthy food choices from local and organic sources and doing my best to use ethically produced products.

## **Exploring the Economic Pillar**

Before I came to Rockwood, the staff had been involved in the social and environmental aspects of ESD, but what about the economic? It was apparent that we needed to do something that was overtly in the economic realm to round out our understanding of ESD, and this is when we took a look at the concept of fair trade.

An obvious opportunity to get started was with our school patrols, who would be served only fair trade hot chocolate on cold days. While it would have been a great improvement to our practice just to go ahead with this adult-driven idea, we wanted to take this to a deeper level. One of our intermediate classes did some inquiry projects about child labor and fair trade. They presented their findings at a school assembly, and I also published some of their finding in the school newsletter. In this way, we were educating a whole community about fair trade and child labor.

As an additional thought to this fair trade project, we also ended the practice of using disposable Styrofoam cups to serve the hot chocolate by purchasing a set of stainless steel mugs. In thinking about the three pillars of ESD, it seemed that this project now touched upon the social, economic, and environmental realms. It was not long after this that the staff coffee club members decided that they would also support the fair trade philosophy with their coffee purchases. This was not something that I had ever mentioned as a school leader and, to me, was an indicator of the strengthening of our school culture with respect to ESD.

## **Incorporating an Indigenous Perspective**

From a Canadian viewpoint, I believe that studying indigenous perspectives on sustainability is critical to a meaningful understanding ESD. It is such an important part of our Canadian culture and heritage that the indigenous perspective needs to be purposely included and integrated into ESD within our schools to give a more complete picture of what it means to live sustainably. According to the IISD document *Our Responsibility to The Seventh Generation* (Clarksen, Morrisette, &



Regallet, 1992), traditionally the Anishinaabe people look to the needs of the Seventh Generation when making decisions about the present course of action. This is a very profound thought that we need to be teaching our children and indeed ourselves. This traditional philosophy is forward thinking and not just about immediate needs and wants.

Another aspect that applies to our understanding of indigenous peoples and sustainability is colonization. It is important for us to realize that there were people here before Europeans arrived, and the colonization of the continent has had severe negative impacts on the livelihood of these First Nations and has been incredibly destructive to their cultures. To understand sustainable living in a meaningful way, we need to be able to look at both the history of destructive practices such as the residential school system and the current challenges facing our indigenous population. Our First Nations people lived in a sustainable manner before our arrival, and we need to learn from them to deepen our understanding.

Although we have made some headway at Rockwood to include the indigenous perspective in our broader understanding of ESD, it has been a challenge, and there are insufficient resources at an age appropriate level. Some initiatives that we have embarked upon include highlighting local Aboriginal heroes and producing a short video about Louis Riel posted on our Web site. The Manitoba curriculum includes some general indigenous perspectives that teachers include as a matter of course. I also engaged the assistance of Aboriginal support teachers and consultants who work in our school division to support schools in their understanding of the history and culture of our Aboriginal people.

We have divided up the school into Anishinaabe clans and have the students participate in whole-school activities with their clans. Each clan has produced a banner with the animal symbolizing their clan, and the older students are expected to help the younger students during activities. Students have been taught in a superficial way about the roles of the various clans. At our winter fun day, we highlighted indigenous culture and technology through activities such as snowshoeing, beadwork, and hoop dancing. We also pursue establishing a relationship with a northern First Nation so that our students may exchange ideas and learn from one another. Our students have been receptive to these initiatives. The question that remains is how to deepen our understanding in this area, both the educators and the students.

## Next Steps

As we continue to develop our understanding of ESD as a school community, it is important to be reflective and critical thinkers, evaluating if we are reaching our goals. What does it mean to develop thoughtful citizens, and what does it mean to become a sustainable school? The Manitoba government has put out a *Guide for Sustainable Schools* (Manitoba Education, 2011) that parallels the work being done in England and Australia. In all three, there is an emphasis on assessment as a



starting point, engaging a wide range of stakeholders, developing a plan, and evaluating progress.

As we begin our next journey at Rockwood to develop a plan for becoming a sustainable school, we are listening to the voices of the students and enlisting parents as our partners. We will develop indicators and measure our progress. The first outcome that the students selected was to conserve electricity. They made a presentation at school assembly and announcements in the mornings as well as actively monitoring whether lights are on or off in rooms that are not being used. They will be able to monitor our energy savings on a Winnipeg School Division Web site that will show them our electricity use in real time.

The energy conservation activities are obviously connected to the environmental pillar. We will have to make the connections to the social and economic pillars more evident. For example, fewer tax dollars go to pay for electricity for the school. These dollars can be redirected toward human health and community well-being. I think connecting the three pillars remains one of our biggest challenges, but with some perseverance, collaboration, and critical thinking, we will be able to rise to that challenge. In the end, we know that we are doing this to ensure a brighter future for all children.

## Final Thoughts

From my perspective, a lot of progress has been made in ESD over the last 5 years at Rockwood School. The number of ESD initiatives at Rockwood School has increased slowly, and the ones that were already in place have been enhanced. The staff have come to an understanding of a whole-school philosophy of ESD and gained the support of the parent community. It has been important to go slowly and not overextend the staff so that they can add depth to Rockwood's ESD initiatives. The greatest barriers seem to be time and resources. There are so many good ideas generated by staff that they cannot all be supported. Nonetheless, it has been exciting to take this journey with a group of dedicated and thoughtful staff, and there will undoubtedly be more meaningful experiences and successes in the years to come.

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## Chapter 23

# The Hopeful Art: Teaching Sustainable Economics

Cynthia A. Wood

Teaching economics for a just and sustainable world requires analyzing what economies are and what they can become. This is challenging in part because most people do not know what economies do. They live and work in one specific economy, late capitalism, and they have learned some fairly specific but problematic things about that economy and how it functions, through classes, economic indicators, policymakers, and the media, all of which are dominated by mainstream economic analysis. Many people are thus constrained in how they think about economic issues without even being aware of those constraints. They confuse what economies do with the current economic system. If, as many of us believe, our current economy is neither sustainable, capable of sustainability, nor especially good at providing for peoples' needs, this confusion must be dispelled before we can get to the question of what economies can be and what we want and need them to be. Students should come to understand sustainable economics as a hopeful art and economies as products of social life that we all participate in crafting.

As a Professor of Sustainable Development at Appalachian State University, a comprehensive public university serving residential undergraduate students who are predominantly White and middle class, I teach courses on alternative approaches to development and economics in an undergraduate program with over 200 majors. Because I teach in a Sustainable Development program, my students are generally knowledgeable and passionate about issues of environment and social justice. This is very different from teaching economics in an economics department, which I have done at the University of Texas, St. Lawrence University, and Bowdoin College, where I faced academic disciplinary constraints and students who were often skeptical and disinterested in sustainability. At St. Lawrence, I team-taught an interdisciplinary course on the environment, social justice, and sustainable futures in the first year program, and at Appalachian State, I have taught in Interdisciplinary Studies and Watauga

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C.A. Wood (✉)  
Appalachian State University, Boone, NC, USA  
e-mail: woodca@appstate.edu

College, a program in which students explore global issues in interdisciplinary, team taught classes that employ a wide variety of classroom formats. These experiences allowed me to teach development from an interdisciplinary perspective and provided powerful training grounds for teaching sustainable approaches to economics and development and in use of nontraditional pedagogies. I have the privilege of working with academically well-prepared and motivated students in a scholarly environment supportive of efforts to build a new theory and practice of economics for sustainability, whatever that entails.

## Mainstream Economics

My course starts with the some basic questions:

- What is an economy?
- What can and should an economy do?
- What constitutes a good economy?
- What would we have to change in the economy for it to be sustainable, and why?
- How does the economy facilitate or detract from our ability to live fulfilling lives?
- What equity issues are at stake in this discussion?
- What about our relationship with nature and other living things?
- What does economic theory have to do with all of this?

We return repeatedly to these questions throughout the semester, and by the end, students have the tools to start imagining a new economy, one of the first steps toward creating one.

We begin with mainstream (neoclassical or neoliberal) economics, the approach that largely dominates economic policymaking across the world, as well as classes on economics. The problems with mainstream economics, from the perspective of sustainability and human welfare, are not primarily about how well or badly supply and demand curves work to describe market exchange but with basic assumptions about human nature, the treatment of natural resources, what an economy is supposed to do, and how it does it. Many of these assumptions are so hidden that most economists could not articulate them. They seem natural but are actually social and historical constructs, and this is what I explore with my students. For the mainstream economic perspective, I use the basic textbook for entry-level economics courses. I currently use N. Gregory Mankiw's *Principles of Economics*, but any principles textbook will do, since the neoclassical economic model is remarkably homogeneous. However, no mainstream economics textbook makes the endemic assumptions I discuss above explicit.

The first important mainstream assumption is that what economies do is to provide goods and services (stuff!) for the people of any given society. Some economies are better at doing this than others, and mainstream economics argues that our current capitalist economy does a very good job at producing the most possible stuff that people want with available resources and then gets that stuff to the people who want it. And if getting people stuff is the sign of a good economy, getting them more

stuff is even better. Continuous growth in an economy is the best possible outcome from this perspective, which is one of the main reasons mainstream economists like capitalism. This point is easily made with the *production possibility frontier*, a graph that can be understood with a few minutes of explanation. I recommend Annie Leonard's *The Story of Stuff* (2010) as a detailed description of all aspects of production and distribution in the current global economy and their associated environmental and equity issues.

Two other mainstream assumptions are central to the sustainability critique. The first outlines the characteristics of human nature that are relevant to economic analysis: "Economic man" is *by nature* rational, self-interested, and has insatiable wants. The second is that there are limited resources. When the two assumptions of insatiable wants and limited resources are combined in the mainstream model, the necessity of choice arises, as we cannot produce the infinite amount of stuff that people naturally desire. The wonder of capitalism, from the perspective of mainstream economics, is described as the "invisible hand." This is the idea that when rational self-interested people act individually in response to economic incentives and their own desires, the maximum benefit possible results for society as a whole. According to mainstream economics, the invisible hand enables the most possible amount of stuff that people want to be produced and then distributed to the people who want it.

I do not have to teach students how to *do* mainstream economic analysis for them to understand the problems with the mainstream approach for sustainability and human welfare. Instead, I use alternative approaches to economics as a means of discussing what mainstream theory leaves out, does not do well, or is a matter of debate (Sackrey, Schneider, & Knoedler, 2008).

## The (Non-) Material World: There Are No Side Effects

An overview of Marxian critiques of capitalism contrasted with mainstream economic analysis can prompt a discussion of what economies do and what we would like them to do (Tormey, 2004). Marx was a great admirer of the awesome productivity of capitalism, the very quality that mainstream economics highlights as what economies should do well (Marx, 1887). But economies do more than produce goods and services, and this is a central component of the Marxian critique. In order to evaluate an actual or potential economy, we need to consider it in its entirety. To illustrate the argument that there are no "side effects" to an economy—only effects you want to highlight and others you choose to ignore or downplay—I use the example of those pharmaceutical commercials, which advertise a drug's wonderful benefits and then quietly and quickly lay out all the terrible things that can happen if you take it.

So, while the current economic system is indeed very productive, we also have to examine the undesirable side effects. We have to ask questions such as these:

- What about the massive amount of toxins and trash produced along with all that lovely stuff?
- What if everyone hates his or her job?

- What if communities and secure livelihoods are destroyed by the economy along with biodiversity and other living things?
- What if domestic and global inequalities are worsened?
- What if the economy is extremely vulnerable to crises such as the most recent meltdown and is losing resilience along with every alternative way of living it destroys?

If these kinds of things are included in our evaluation of the current economy, the picture is not as rosy.

Marx (1894) was good at analyzing many of the downsides of capitalism because he understood that any economy is a system of social relations that emerge over time. He argued that the same things that make this economic system so efficient in terms of producing output also prevent or destroy many social relations vital to living well. People working on an assembly line are not able to engage creatively with their work or feel satisfaction in what they do nor can they build deep and cooperative relationships with their coworkers. Someone buying food at the grocery store is not able to see the very direct relationship she has with the worker who produced her food. People feel they have choices because there are hundreds of shampoos on the shelves of the grocery store, but they do not see that other more important choices are not possible. People see themselves as valuable only in the terms that the economy values them—as workers and consumers. Marx discussed these ideas in terms of “alienation” (Marx, 1988). E. F. Schumacher’s chapter on Buddhist Economics in *Small is Beautiful* (1999) is a lovely introduction to thinking about how what is valued is reflected in what an economy does and might do.

Once students begin thinking about how an economy has impacts other than how much stuff is produced, we are able to talk about how they would like to live, what they think is important for living well, and how an economy can encourage or discourage those aspects of human life and culture they value. It is not surprising that students have a hard time discussing intangible things like community or creative satisfaction and continually revert to the material—even if it is to say we should be “living more simply,” by which they mean with less stuff. I want them to see that they carry biases that must be changed or unlearned if we are to create new and positive economies. As a result, we are able to talk about the way our own upbringing and economic system makes it difficult to think beyond what we have learned is possible and desirable and that this is true for everyone.

## Needs, Desires, and Human Nature

Discussions of what students value and would like to see in society and how these are affected by the economy inevitably bring us to a consideration of needs and wants. A similar discussion emerges from analysis of the ideas of needs and wants implicit in the Brundtland Commission’s definition of sustainable development (World Commission on Environment and Development, 1987). Many Americans

think they need lots of stuff. They do not think they need other people, nature, or community. How did this come about? According to mainstream economics, “consumer tastes” are determined outside of the economy, and advertising simply provides people with information about products, but it does not create desire. This is one of the mainstream assumptions that students simply cannot swallow because it contradicts their personal experience. They realize that their own desires are shaped by advertising and that the same is true for family and friends. Through course readings, students encounter research that confirms their experience, and we are able to talk about what this means for the mainstream argument that resources are allocated efficiently under capitalism. We are also able to challenge the notion that people naturally have insatiable wants, as research shows that advertising not only shapes people’s desire for particular products but for more stuff in general. It is easy for students to see that the constant message to buy more, combined with countless opportunities to buy, actually creates people who continually *want* more.

If the economy creates a desire for specific things as well as the overall desire for more, this means that a different economy could do the opposite. Since it is also well documented that after a certain basic level of consumption, having more stuff does not actually make people happier (see Leonard, 2010; Williamson, 2008); this is not a message of distressing austerity but one of hope. The argument that “that’s just the way people are” doesn’t hold water with regard to wanting more and more stuff. We can create a different economy that is not only more sustainable but also increases human welfare. This is an important insight because sustainability is usually presented as something that can only be achieved through painful sacrifice. It is possible that there are other aspects of human nature we could consider in building a new economy. For example, people may actually need variety and change to be happy. If so, can we fulfill this need in a sustainable way? Variety doesn’t have to mean new. If “swapping” was made easy and desirable, this need for variety could be met in a way that does not result in manufacture and consumption of new stuff.

The discussion of advertising allows us to return to the question of choice. Even if we limit ourselves to choices about what to buy, students see that while they can choose one of those many shampoos on the shelves, they cannot choose to consume products that were made without toxic extraction, production, and disposal processes or which are derived from renewable resources, no matter how much they want that. As they look ahead to their own working life, they also see that options about how to live are similarly limited. The choices so central to the mainstream exaltation of our current economic system are illusory, in part because those we are actually offered are almost entirely based on exchange—and only if we have money.

## **Inequality, Choice, and Rational Allocation of Resources**

In my classes, I spend some time on other material claims made by mainstream economics with respect to resource allocation under contemporary capitalism because I think they are both false and difficult to see as false without critical

knowledge of the model. The mainstream argument about distributional efficiency goes as follows:

- When individuals make purchases, they are signaling producers what it is that they most value.
- Producers then know what it is they should produce, from among the seemingly infinite variety of ways to use resources.
- The best possible use of resources results because the output people want most is what is then produced, and this output is distributed to the people who want it most when they buy it.
- This is done with no centralized authority making decisions; in fact, a centralized authority would not be able to respond as quickly or be as motivated as a firm facing the carrot of profit and the stick of losing it, possibly enough to go out of business.

With this argument, mainstream economics claims that the free market (implicitly, under capitalism) results in the most efficient use of resources to produce the things that society wants most. In addition to the role of advertising in shaping people's desires, there are two major problems with this claim, both of which stem from the unspoken proviso, "given existing conditions." Existing conditions include capitalism itself, the current distribution of income and wealth, and the historical and social constructs of private property and exchange. These existing conditions are vital in determining outcomes.

First, what is called "demand" in mainstream economics is not simply what people want but what they want *and can pay for*, "effective demand." People without money cannot demand anything in this context. If the distribution of income was equal, then there might be more validity to the mainstream claim to the best social outcome of individual choice, but it is not. With an unequal distribution of income, the luxuries of the rich will be produced before the basic needs of the poor. Least able to express demand are those who have no income at all—the unemployed, the children, the elderly, and the disabled.

Second, because demand can only be expressed in terms of *individual* purchases, collective options, which would be far more rational for resource use and human well-being, are not possible. For example, individuals with money have the "free" choice to buy playground equipment for their children, and many do. As a result, all over North America, backyards are filled with swing sets and monkey bars available to the children of that household and their friends. What existing conditions do not allow for, as an expression of individual demand, is the construction of a neighborhood playground on which all local children could play. The overall expenditure of money and resources is on a large number of individual playgrounds that are not used very much, with some children (those without money) having no access to a playground at all. Fewer resources would be used on a single neighborhood playground, even if it were large and fanciful, more children would have a place to play, and they would play together, which is both more fun and productive of other community benefits like caregivers spending time together and having leisure of their own.



The same argument could be made for investments in the *commons*. The commons refer to resources that are shared by a community or owned in common. Examples could include anything from agricultural land, to tools, to movie theaters. It is more difficult to create a collective benefit in areas which have been stripped of any kind of commons in the name of individual choice. When the commons do not exist, people do not learn the social skills necessary to share common resources. This is another example of the economy contributing to what appears to be human nature.

The mainstream treatment of the commons is generally problematic in terms of sustainability. The tragedy of the commons, according to mainstream economics (Hardin, 1968), occurs with any common resource because rational self-interested people will act to maximize their individual benefit and thereby destroy the commons. The solution to this problem is to privatize common resources. In my class, we read a brief article by Ostrom, Burger, Field, Norgaard, and Policansky (1999) in which they question this conclusion by discussing real-world examples of healthy commons and the conditions under which they function. In class, pointing out the commons that students *are* familiar with is helpful. These included examples such as libraries and public parks. We move from these examples to discussions of efforts to recreate commons around the world.

Mainstream economists also argue that no one will contribute to the production of something from which many people benefit unless there is a significant individual reward, which is the argument for copyrights and patents. Knowledge, information, and even artistic endeavors are maximized, the argument goes, when the people who do the work to produce it are individually rewarded. The “information commons” call this conclusion into question. Information is an example of a commons which when used does not deplete the resource, and there are plenty of people who work voluntarily to bring about new information and are passionate about keeping that information free. Juliet Schorr (2010) points out the logical flaw in the mainstream argument as well: The number of people kept from information by copyrights and patents who might have benefitted and built upon that information is very high, high enough to cancel out any loss due to lower economic incentives. In addition, there are incentives besides economic ones that appear to work just fine, such as creative fulfillment in solving puzzles, public accolades, and the satisfaction of doing something for the community (147–154). These examples resonate with college students from a generation that has grown up with access to a wide variety of media and information technologies.

Again, part of the conclusion here is that sometimes commons may not work under contemporary capitalism because people have learned to compete for resources and have not learned to share. People who live in economies with functioning commons have learned how to share and, in some cases, may not know how to compete for resources very well, which makes them vulnerable to incursion by those imbued with “the spirit of capitalism.” Examples of successful commons that Ostrum et al. discuss have fairly specific characteristics: They tend to be small in scale, people know each other well, are both knowledgeable about and dependent upon the commons, and are able to maintain boundaries that keep interlopers out.

These characteristics do not apply to global commons like air and fisheries. However, as Patel (2009) argues, it was often only when industrial capitalism and accompanying concepts of private property entered the picture that these commons became endangered, which suggests commons-based solutions rather than privatization. For example, fisheries in Chile recovered when industrial trawlers were banned and local fishermen were given use rights over traditional fishing grounds and allowed to manage it as a commons (Patel, p.106).

## **Profit and Power**

Marx's major argument about the downside of capitalism is that the combination of production for exchange and private ownership by a few of the resources that everyone needs is not good for the majority of people. This combination gives the few an extraordinary amount of power in comparison to everyone else, and they make decisions about what will be produced and how on the basis of their own profit rather than needs of the people (Marx, 1894). Mainstream economics has an answer for this: It does not matter if people act in their own self-interest, as long as everyone is better off. However, if people actually are not better off, there is a problem with the argument. I leave it to students to consider the implications of this conundrum.

The Marxian analysis of power (1894, 1988) opens the door to discussions of corporate influence on the political system (which is how students are used to thinking of power) and, more importantly, to what seem to be "natural" economic arrangements but are also expressions of economic power. "Why are decisions made by owners rather than workers?" and "Is the 'free market' really free when corporations receive subsidies and tax breaks?" We do not limit ourselves to Marx's discussions of power, which means we can talk about global concerns, race, gender, heteronormativity, age, and a wide variety of other topics students introduce as they begin to see the broader implications of the assumptions that underlie mainstream economics. This is important not only for analyzing how the current economy works but also for considering how to build future economies.

It is easy to prompt a discussion of the problems with production for profit. My students are not generally old enough to have had many encounters with the US system of medical care for profit, and few have lived in anything like poverty, but they have plenty of experience with shopping. Consequently, they have no problem coming up with examples of things people buy that they think are worthless or destructive, and as such, a waste of resources better used in the production of goods and services needed by people with very little or better not used at all. The connection between the drive for profit and the compulsion to produce and sell more and more is logically straightforward to them. For environmentally aware students, the generational equity issues at play in our current economy are not an abstraction. They believe their future is being destroyed. While they are used to thinking of this in terms of the current generation's shortsightedness and selfishness, our discussion points them to the problematic economic structures behind people's behavior.

## Limits to Growth

Ecological economics provides the context for discussing the issue of limits. The first chapter of Herman Daly's *Beyond Growth* (1996) provides a succinct statement of the issue. One of the mainstream economic assumptions is that resources are limited. A closer look at this assumption, however, clarifies the difference between two understandings of limits. For mainstream economics, resources are limited *at any given time*. Today, there is only so much energy, raw materials, capital, and labor that can be used to produce goods and services. If economic investments are made, however, the capacity to produce more increases. There is no upper limit to growth *over time* in the mainstream model. This is in sharp contrast with approaches to sustainability represented by Daly and others (Czech, 2000; Daly & Farley, 2004; Hawken, 1993; Speth, 2008) who argue that the Earth has a finite capacity to produce output, so we must build an economy which recognizes this limit.

My students do not have any problem accepting the concept of limits or that an economy must operate within those limits. We do spend some time talking about the potential malleability in this concept—renewable resources make limits somewhat flexible, and shifting to other resources when one runs out is certainly possible, as mainstream economics point out. These elements of flexibility are not infinite, however, and are constrained by nature; human ingenuity can expand (or contract) but not circumvent these limits.

The problem with talking about limits with students is that they do not really understand how radical a change in our economy and way of life would be mandated by acknowledging ecological limits. It helps to give them exercises to work on, especially in groups: “You live in a community which has learned that each person must live with 40% fewer resources than before. What happens?” The first responses are often about competition and violence. “People will steal from each other, or compel a division of resources such that some people have more than others.” These responses invite discussion of the ways we have been socialized to be competitive rather than cooperative.

I also suggest that societies can be imagined that may be sustainable in the sense of living within limits but not desirable or just. For example, repressive environmental dictatorships could shoot people if they fail to recycle, or very inequitable but alternatively sustainable societies might exist with a small number of people using most global resources. These examples lead to discussions of Bhutan's centralized government, the Gross National Happiness Indicator, the possibility of benevolent dictatorships, and the question of whether inequity is socially sustainable.

Students are able to see that cooperation and structural changes that encourage sharing resources, such as public transportation or working together on large projects, are likely to allow people to live fairly comfortably. They also see the merits of localizing economies as another option for conserving resources.

It is important to point out to students that Daly and many other ecological economists tend to focus on material consumption and do not address nonmaterial aspects of economic life. Daly in *Beyond Growth* dismisses the idea of including

culture within definitions of sustainable development. This is in part because he is analyzing resource limits but also because he is—well—an economist. When I pose the question of why culture might be an important concern when talking about limits, students generally offer both of the relevant answers: that economies are social systems and cannot be transformed without attention to culture and that cultures are intrinsically valuable and should be preserved for themselves as well as in the interest of sustainability.

## Global Inequity

Class discussions of competition and violence over scarce resources in the context of limits naturally lead to an analysis of global inequity. Students need to think about how to make economies based on limits equitable and why that is important. Helping students of privilege truly understand what living with too little really means is a challenge I have not been able to meet yet. Although my students are keenly aware that poverty exists, they frequently are exposed to vivid images of poverty in the media and encounter poor and homeless people regularly. Many of my students are already concerned with social justice issues. However, few of them have had direct personal experience with poverty.

Aside from fairness, there are other sustainability concerns. There is good evidence that people are happier when they live in an equitable society (Wilkinson & Pickett, 2009), but even if that were not true, thinking about the resources used to keep richer people “safe” from those who do not have as much, or the worry associated with inequity-based crime, are important detriments to living well that come up in discussions.

Global inequities in particular raise somewhat different issues. Mainstream economic theory suggests that rather than everyone producing all of what they need, they should specialize in producing the things in which they have a “comparative advantage” and then trade. This increases overall production and therefore well-being. This apparently neutral recommendation looks less innocuous from the post-colonial perspective, however, because what it means for poorer countries is that they should specialize in primary products like basic agriculture and raw material extraction—exactly their role under colonialism. Power imbalances derived from an inequitable global economy, including the legacies of colonialism and richer countries’ control over institutions such as the World Trade Organization, make the mainstream recommendation problematic.

Students apply these issues to the case of fair trade. While attempting to improve the economic position of people in poorer countries producing for richer ones, fair trade does not alter global economic structures that disadvantage poor folk in any substantive way. Students are able to articulate why trade is still oriented toward and controlled by richer countries and the poor continue to produce primary products like coffee and cotton or low value-added handicrafts. In addition, students often point out the sustainability concerns left in place by fair trade, especially fossil fuel use associated with transporting goods long distances.

It is important not to romanticize people in poorer countries, especially indigenous people, who are often portrayed as victims with an inherent understanding of nature. Both capitalism and globalization take different forms in different places, depending on local history, culture, and resources. Still, the drive to homogenize is one of the features of globalizing capitalism. In class, we talk about social diversity being lost along with biodiversity as economies change with globalization. This process is worrisome both because it means that new consumers with insatiable wants are being created and that the resilience associated with diversity is being lost at the same time, as the global economic crisis that began in 2008 demonstrates.

## Nurturing, Provisioning, and Sufficiency

Feminist economics opens the door for another layer of discussions about what economies do and should do. There are obvious social and environmental justice issues related to gender, and we discuss these in class in terms of equity. However, there are less obvious concerns raised by feminist theory that are also important to consider in the creation of sustainable economies.

For the purposes of the class, I concentrate on two of these. First, is the treatment of nonmarket domestic work and caring labor, both traditionally considered “women’s work” and devalued in most economies and economics as well. In material terms, the exclusion of nonmarket domestic labor from economic analysis is a flaw for both welfare and sustainability. This work uses resources and produces output that must be considered in the context of limits. Once viewed as a sector of the economy, however, it is noticeably different from others in ways that are of interest for sustainable economics, as it is dominated by low-resource services and often performed out of a sense of obligation, altruism, or reciprocity that distinguishes it from the market economy.

Nonmaterial concerns are equally important to consider. Care and nurturing occur in many households and also in market labor such as nursing and childcare. The logical outcome of rational and self-interested economic behavior in our current economy is that less and less of this labor will occur, as it is done for free or poorly paid. We need to be careful not to essentialize women as naturally caring—much domestic labor results from social and cultural coercion that is the source of major inequities on the basis of gender. Commodification of domestic labor can make this more visible. See Folbre, 2003 for an overview of both market and non-market concerns. Yet as we imagine sustainable economies, it seems likely that we would like to have more rather than less caring and nurturing, of people as well as the environment. What is needed to make this happen?

Students understand the criticism but find it hard to hang on to, as they may not readily think of the household in economic terms, which is exactly the feminist critique. Placing this point in the context of discussing what the economy is *for* is helpful (see Nelson, 1993). If the function of economies is *provisioning*, there is no logical conflict with considering the work of households in economic terms. More

importantly, it might be best to model our thinking about sustainable economies on households. A household must carefully manage its resources so that the needs of its people are met. Those needs include emotional, social, and cultural as much as physical dimensions. Mankiw (2008) highlights this point when he opens his mainstream principles textbook with a paragraph on how difficult it is to compare the modern economy with households, despite the etymology of the word “economy” from the Greek *oikonomos*, “one who manages a household.”

## Detoxing the Economist

Another challenge I face in teaching sustainable economics is myself. An economist may be best equipped to discover her or his own biases and, at the same time, perhaps the least likely to do so. For example, I had been working on my dissertation on unpaid housework for a couple of years before I realized that I tended to think of production in terms of goods: Inputs are combined to produce outputs. While this approach can (and is) stretched to apply to the production of services, it is a much more comfortable fit with the production sequence:

Inputs ----- → Factory ----- → Outputs

This vision of production subordinates services to goods in economic thinking. Since services are often based on the renewable resource of labor, in comparison with goods, which necessarily contain material components extracted or synthesized from the earth, this bias is problematic for building an economics of sustainability. The mainstream economic concept of “consumption” is similarly problematic, as it promotes the sense that products have to be used up to meet people’s needs.

More broadly, when I look at the world through the eyes of an economist, I think of it in terms of resources, a term which implies something to use. This is so even though I am a critical economist, passionate about sustainability and equity issues that I believe require people at all income levels to consume less. When we talk about conserving resources, we still accept the perspective that the Earth is composed of materials available for our use, even if we do not use them. (This is a different point from saying that they are for sale, but the former underpins the latter.) There are good strategic reasons for doing so. However, we look at trees in the forest, the fact that some people look at them as resources to be exploited may push us into the position of “protecting resources.” We can justify reducing environmental destruction in terms of saving resources for current or future generations. But once we take the approach of building sustainable economies and economics, we must disabuse ourselves of the assumption that the world is composed of resources available (or not) for us to use and think in terms of relationships.

As an economist, I find this realization very difficult to conceptualize. I confess these struggles to students, in part so that they can see how unexamined concepts

can shape how one thinks in powerful ways. We have some very interesting class discussions as a result. Students discover that some of these questions are as challenging for them as they are for me since an increasingly consumerist society makes everyone think in materialist terms. This leads us to bigger questions yet: How do we reimagine the world so that we live from what it gives us, as we must, without thinking of it as a mine for resource extraction? This is a question not only of what that would look like but how to make it happen.

## Hope and Sustainable Economics

The most important lesson I have learned about teaching sustainable economics is that offering realistic hope is crucial. Academia is built on the foundation of critique. I value critique in teaching sustainability because I do not want to give students false hope or to send them out to do work that does not change anything. I know too much to say to them “don’t worry, all we have to do is recycle and everything will be ok!” They want easy answers because despair is nipping at their heels and they are very afraid that nothing can be done.

Raymond Williams (1989) argued that “to be truly radical is to make hope possible rather than despair convincing” (p.118). I believe this is my job as a teacher. Despair is not sustainable. Nor does it contribute to sustainability or social justice. In some ways, teaching hope is hard. Like most of us, students have been taught that things are the way they are and that people cannot change anything really important. Faced with examples of significant change, they say “yes, but we couldn’t do that *here!*” I can teach realistic hope in the context of sustainable economics because I believe there is hope. I offer my reasons in class:

- Things are different in other parts of the world; that means we can do things differently here.
- Things have not always been this way; that means they do not have to be now.
- Many of the things we need to do to create sustainable economies can also make us happier.
- Slowing down, localizing, sharing, and creating equitable societies can build community, skills, fulfillment, and social relationships.
- We do not have to wait for the revolution, or rather we make the revolution by doing it, and in the process, transform people into people who can live, happily, in sustainable economies.
- There are no easy answers, or one answer, but that is a good thing, because diversity is a source of chaos, creativity, joy, and resilience.

It is very important to have discussions in class and to read material that offers realistic hope. We do this throughout the course, but at the end, we read Schorr’s *Plenitude*, (2010) which builds a strong and consistently positive case that we already have everything required to create sustainable economies. As the final class project, I ask students to work in groups to decide what they think are important and



desirable characteristics of good and sustainable economies. I remind them of the dangers of reproducing structures and attitudes that do not further the changes we need and want and to consider human needs in nonmaterial as well as material terms. I want to do more of these exercises throughout the course, with smaller and more specific questions that change the ways we do things as well as what we think about, such as an art project or proposals for low-resource projects that satisfy non-material needs or desires. So far, I am afraid that my assignments have not been as transformative as course content. I generally give exams on the differing approaches to economics, with review questions that guide the students in their thinking. Research papers did not work at all because students do not have the tools to understand many contemporary economic issues, like the recent economic crisis, or to decipher mainstream economic language or concepts. Concept papers are much more helpful, if you can frame questions in such a way that they are forced to think about their answers.

By then they have the means to do this and to make practical suggestions about how to bring such communities about. I encourage them to be as creative as possible because I want them to continue the process of building sustainable economies after they leave the class. Once they have the tools to think critically about economics and economics, they are at least as able to do this as I am.

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# Afterword

How will future generations judge us? Will they look at our energy-rich lives and overt consumerism and compare our excesses to Roman society before the collapse of the empire? Will they look at what we knew about environmental degradation, social injustice, and economic inequity but chose to ignore and decide we were like ostriches with our heads in the sand? Or Nero fiddling while Rome burned? Will they look at our hopes for technological fixes rather than developing the political skills and will to find social and community-based solutions? Will our great grandchildren ask us, “You knew; what did you do?” The 32 authors in this book will have a positive answer to that question and so will the thousands of teachers who practice ESD and hundreds of administrators who support ESD.

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