Chapter 10
Dearness Environmental Society and the Sudbury Schools

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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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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/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.[1]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.

[1]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

- 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.[2] 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

[2] 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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