

The official magazine of the Manitoba Association of School Superintendents



Sustainability

SPECIAL ISSUE

### Join the Conversation – ON THE ECO EDUCATOR FORUM



#### ECO Canada and environmental education

Exciting opportunities are available for students interested in pursuing environmental studies. A growing environmental sector coupled with the demand for highly skilled professionals provides a green opportunity for students contemplating their post-secondary prospects.

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#### The ECO Educator Forum and Manitoba's education challenges

In a 2006 report on the challenges facing rural education in Manitoba, M.A.S.S. discussed issues facing geographically isolated teachers, including fewer opportunities to collaborate with other educators in their field and grade level (p. 3). To successfully promote improvements and innovations in environmental education, ECO Canada aims to develop stronger communities of environmental educators who can benefit from shared resources and best practice models.

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#### Spring 2011 Volume 12, Number 1

#### M.A.S.S. Journal

Published For:

#### The Manitoba Association of School Superintendents

375 Jefferson Avenue Winnipeg, Manitoba R2V 0N3

Phone: (204) 487-7972 Fax: (204) 487-7974

E-mail: coralie.bryant@7oaks.org

Web: www.mass.mb.ca

Published By:

Matrix Group Publishing Inc. Publication Mail Agreement Number 40609661

Return Undeliverable Addresses to: 52 Donald Street, Suite 300 Winnipeg, MB R3C 1L6

Toll free: (866) 999-1299 Toll free fax: (866) 244-2544

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A student from Chapman School shows off some of the potatoes the school's organic garden produced. Chapman has earned Earth School status in the SEEDS Green Schools Canada program, as Pembina Trails School Division Assistant Superintendent Graham Bruce writes in his article on page 30.

Manitoba Association of School Superintendents 5

#### Greetings

Manitoba is committed to preparing educators, students and their communities for the emerging social, economic and environmental challenges of the 21st century. Education for Sustainable Development (ESD) has been identified as one of the province's top priorities and an ESD action plan including the Sustainability and Education Academy (SEdA) was developed to promote understanding, awareness and action in Manitoba schools. ESD equips students with the knowledge, skills and values necessary to make decisions based upon a consideration of their full environmental, economic and social implications.

There is a rich diversity of organizations in Manitoba providing ESD support including educational institutions at all levels, non-government organizations, community groups, and environmental education centres.

Working together we are all supporting students experiencing and learning what it means to live in a sustainable manner.

#### Message

Le Manitoba s'est engagé à préparer les éducateurs, les élèves et leur collectivité aux nouveaux défis sociaux, économiques et environnementaux du 21° siècle. L'éducation pour le développement durable (EDD) est considérée comme étant l'une des plus grandes priorités de la province et un plan d'action d'EDD comprenant le Séminaire sur la durabilité et l'éducation (SedA) a été élaboré pour favoriser la compréhension, la sensibilisation et l'action environnementales dans les écoles du Manitoba. L'EDD permet aux élèves d'acquérir les connaissances, les compétences et les valeurs nécessaires pour prendre des décisions en tenant compte de tous leurs effets au plan environnemental, économique et social.

Une riche diversité d'organismes au Manitoba, y compris, les établissements d'enseignement de tous les niveaux, les organismes non gouvernementaux, les groupes communautaires et les centres pour l'éducation en environnement, fournit de l'aide pour l'EDD.

Par notre collaboration, nous aidons les élèves qui expérimentent et apprennent ce que signifie mener une vie qui respecte les exigences du développement durable.







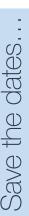
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#### A Message from the President



**Paul Cuthbert** Superintendent/CEO Evergreen School Division

he statement above was developed by the United Nations General Assembly, who adopted a resolution to put in place a United Nations Decade of Education for Sustainable Development. The United Nations Decade of Education for Sustainable Development (2005-2014), for which UNESCO is the lead agency, seeks to integrate the principles, values, and practices of sustainable development into all aspects of education and learning.

As the President of Manitoba Association of School Superintendents, I am pleased to present an expanded issue of our Journal on the theme of Education for a Sustainable Future. This special issue should signal our organization's commitment to public education that is responsive to the needs of today's learners, our communities and our world. This journal presents articles from school divisions and institutions across Manitoba, revealing that the concept of Education for Sustainable

"There can be few more pressing and critical goals for the future of humankind than to ensure steady improvement in the quality of life for this and future generations, in a way that respects our common heritage—the planet we live on. ... Education for sustainable development is a life-wide and lifelong endeavour which challenges individuals, institutions and societies to view tomorrow as a day that belongs to us all, or it will not belong to anyone."

(UN Decade of Education for Sustainable Development, 2005-2014)

Development (ESD) is complex and open to different perspectives.

Traditionally, education systems have viewed education for sustainable development as environmental education. While this is an important component of ESD, it is only one of the multi-faceted social, economic, cultural and environmental problems we face in the 21st century. ESD addresses the interrelationships among the environment, the economy and society.

As we enter the second decade of the 21st Century, research has never been clearer in revealing that our world as we know it is no longer sustainable if we don't significantly change our perspectives and behaviours. We live in an era of significant climate change, massive environmental deterioration, escalating loss of non-renewable resources. Our future graduates will soon struggle to provide food, shelter, and other basic necessities for roughly 50 per cent more people on the planet while using less water, less arable land, and with access to fewer ocean resources. They will need to discover how to increase our energy supply at least tenfold while removing carbon dioxide and other greenhouse gases from the atmosphere. The need to solve the other environmental, economic, and social problems inherent in the concept of sustainability will prove equally challenging. The challenges and plans for action around biodiversity, trade, debt, deforestation, poverty, education, agriculture, desertification, human settlements and consumption will only be solved if we prepare our students for these challenges.

ESD involves a reorienting of education to guide and motivate people to become responsible citizens. ESD must move students from learning about sustainable development to students experiencing how to live sustainably. As such, it encourages linking ideas to action. ESD supports the acquisition of knowledge to understand our complex world and the development of interdisciplinary, critical thinking, and action skills to address these challenges with sustainable solutions. ESD requires changes in "how" teachers teach, not just "what" they are teaching.

I invite you to enjoy the articles in the enclosed journal and consider the ideas presented here in your own efforts to infuse ESD into teaching and learning in public schools. This is an important precursor to our organization's plan for our Educating for a Sustainable Future conference to take place on November 15 and 16, 2012, at Canad Inns Polo Park.

Sustainable Development should not be viewed as an "extra" to be built into an already over-crowded curriculum. The scope of education for sustainable development embodies the very purpose of education itself and must be modelled by all in the system.



#### **Sustainability; Educating for Action**

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"I did enjoy the conference more than any other that I've attended. It was fantastic." (2010)

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"The conference was stimulating, informative and triggered all kinds of learning." (2008)

"What a great conference it was-one of the best I've been to." (2008)

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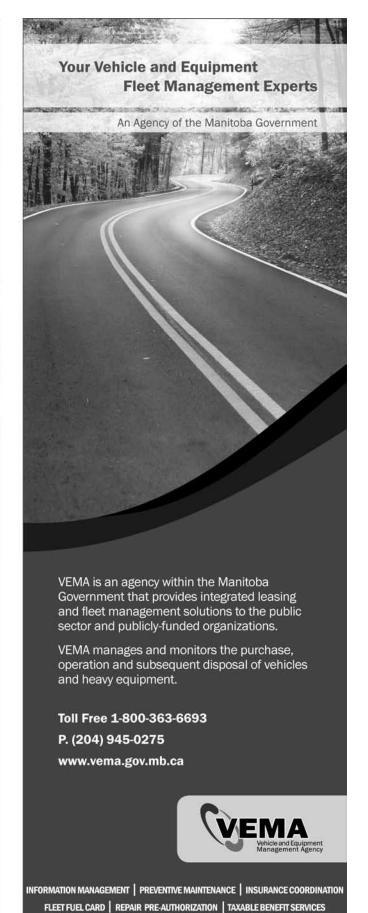


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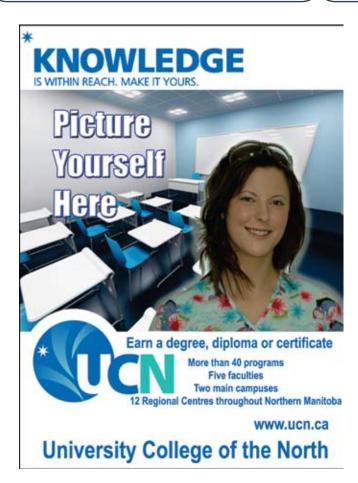
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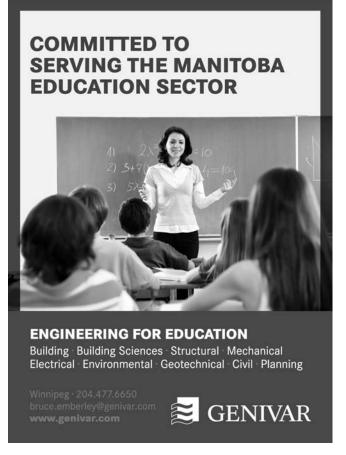


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# Learning for **Sustainability** in Manitoba

#### By Carolee Buckler and Anne MacDiarmid

oday's students are facing many complex environmental, economic and social issues, including increasing population, global warming, water scarcity, poverty, and health concerns, to name a few. These issues require students to be able to understand and value the connection between the natural world and the human world. They call for students to be able to communicate, think critically, create and act upon positive change for the health of our planet. Now and in the future, young people will need to be able to find creative solutions and alternatives to unsustainable habits and practices.

Education has been recognized internationally as fundamentally important to addressing the critical sustainable development challenges we face. Educating our children and youth towards a sustainable future is a powerful tool for shaping students' value systems and behaviours. Learning for sustainability at an early age can shape the way children approach and interact with the environment that surrounds them. Furthermore, what students learn in school can also impact an entire household; for example, we have witnessed children learning about recycling who have changed the waste disposal habits of their entire family. The challenge for education is not just to produce more knowledgeable citizens but also to produce more motivated citizens who will act upon their knowledge.

The United Nations has declared the decade from 2005 to 2014 the Decade of Education for Sustainable Development (DESD). The overall goal of the DESD is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. "This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental

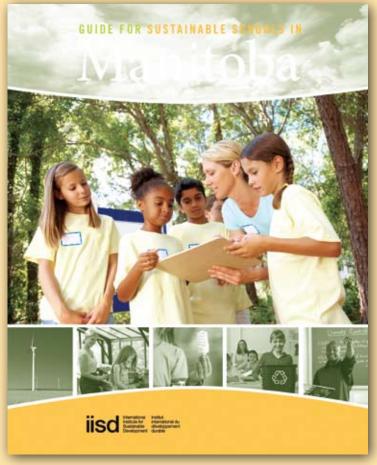
integrity, economic viability, and a just society for present and future generations."1

#### **How Manitoba is involved**

Canada, through the Council of Ministers of Education (CMEC) and as a member state of the United Nations Economic Commission for Europe (UNECE), played a role in developing UNECE's Strategy for Education for Sustainable Development. In 2008, CMEC included 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. A CMEC ESD working group chaired by Manitoba was created in 2008 to co-ordinate action to support and strengthen the implementation of ESD in all provinces and territories. The CMEC ESD working group has been tasked to develop a Pan Canadian Framework for Collaboration and Action based on four priority areas:

- 1) Infusing ESD competences across the curriculum.
- 2) Building ESD capacity through professional learning and research.
- 3) Identifying and Promoting Learning Resources to Support ESD.
- 4) Supporting and guiding the implementation of ESD system-wide.



The Guide for Sustainable Schools in Manitoba contains a wealth of resources and examplars, as well as a school planning template.

Manitoba has taken a leadership role in education for sustainable development (ESD) by implementing many of the aims and goals of the decade. Not only has Manitoba Education identified ESD as one of its priority action areas, sustainability is also embedded in its mission statement: "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."

Sustainability is also included in its overarching goals: "To ensure education in Manitoba supports students experiencing and learning about what it means to live in a sustainable manner." The department, many partner organizations, school divisions and individual schools are involved in a variety of initiatives aimed at helping to prepare our students to live sustainably.

Manitoba has advanced ESD in K-12 education through 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 sustainable school is one that prepares young people for a lifetime of sustainable living through its teaching, fabric and dayto-day practices. A sense of community is also critical to the sustainability of our planet because we need the collective wisdom, collective effort and a shared vision for a sustainable future. A whole school approach to sustainability helps schools achieve a stronger sense of community by creating a collaborative space for sharing and envisioning what it means to live sustainably.

It is important to note that several 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, water conservation) and programs (e.g. curriculum development and implementation,

teacher professional development, student project initiatives). Many schools in Manitoba have also been involved in identifying and addressing local sustainability matters prior to ESD becoming a priority in Manitoba.

#### **SEdA inspires leaders**

From 2007-2010, Manitoba Education partnered with York University to provide the Sustainability and Education Academy (SEdA) aimed at inspiring educational leaders to create a culture of sustainable development, integrated into all aspects of the K-12 education system.

Participation in this SEdA program has provided opportunities for Manitoba school divisions to develop ESD action plans aimed at saving divisional operating costs, practicing environmental sustainability and providing a context through which students can learn how to live sustainably as they advance through the K-12 education system. Indicators for success are measured by the action plans school divisions have developed for governance, curriculum teaching and learning, human resources and facilities and operations which provide whole divisional approaches to sustainable development. Post-SEdA follow-up meetings have been held for all SEdA seminar participants to share their progress with other school divisions. Educator workshops provided within school divisions have increased teacher awareness and competency to teach students to live in a sustainable manner. The impact on student learning as a result of school divisions participating in SEdA has been far reaching and, to date, 26 of the 37 school divisions have participated in the SEdA seminars and continue to develop and refine their divisional ESD plans.

#### **Guides for sustainability**

In 2011, Manitoba Education released the *Guide for Sustainable Schools in Manitoba*. This document was a result of a partnership between Manitoba Education, the International Institute for Sustainable Development and school divisions in Manitoba, a partnership designed to help individual schools and communities become sustainable. The Guide contains a wealth of resources and exemplars, as well as a school planning template, to provide a scaffold for the school community to

create their own unique and locally relevant sustainability plan.

Manitoba Education has developed materials for senior education officials, educators, students and parents to build awareness and support for ESD, and to prepare young Manitobans to live and work for a more sustainable future.

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 whole schools at the Awareness, Action and Transformation levels.

To support educators within the context of school curriculum, ESD is embedded in the Manitoba K-12 curriculum, with specific outcomes established in science, social studies, health and physical education. New curriculum is being developed and technical and vocational education curricula are being analyzed to determine where sustainable development concepts can be introduced. In addition to integrating ESD into the curriculum, Manitoba Education is rewriting its Grade 12 World Issues course to be a course on Global Issues: Sustainability and Citizenship with a strong emphasis on sustainability and what it means to be an ecologically literate citizen.

All new schools being built in Manitoba need to meet at least a minimum Leadership in Energy and Environmental Design (LEED) silver certification (but we strive for the gold standard). We are also promoting and actively supporting greening and ecologically sustainable schoolyards that will be used as outdoor classrooms. Getting students outside the classroom walls and into the outdoors/ natural environment is an important part of educating for a sustainable world. Current research is showing that students being connected to and learning about the natural environment can result in greater academic achievement in other subject areas. Manitoba Education is working with a number of stakeholders to create a guide for Teaching in the Outdoors.

In our efforts to prepare young people to enter the labour 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*. The Guidebook will provide essential information, resources and tools for students, school and counsellors.

Teacher education institutions are also important partners in the ESD initiative and serve as key change agents in learning for sustainability in their role of developing teacher candidates. Teachers must learn how to integrate sustainability in their classrooms. The need for professional learning about ESD has been

recognized internationally through agencies such as UNESCO, which has identified the professional development of teachers in learning for sustainability "as the priority of priorities."<sup>2</sup>

Manitoba Education is working with faculties of education to incorporate ESD in teacher education and training by providing pre-service ESD teacher workshops; hosting an ESD Seminar for faculty members in partnership with Learning for a Sustainable Future (LSF) and the Deans of Education in November 2009; and developing a committee of

Faculty of Education representatives to make recommendations on ESD in teacher education. In addition, Manitoba Education is leading a Pan Canadian study with the CMEC to develop a better understanding of how Canadian Faculties of Education are incorporating ESD into their pre-service programs, research and other activities.

#### Are we making a difference?

How do we know whether our efforts in Manitoba are having an impact? Manitoba Education is working with the International Institute for Sustainable Development (IISD) on a pilot study to measure students' understanding, attitudes and behaviours concerning sustainable development and ESD. The basic assumption is that it is important, in ESD, to measure not only the knowledge attained, but the attitudes and behaviours of the students being surveyed. It also assumed that young people's behaviours 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 more influence than knowledge. For 2009/2010, the survey instrument was refined and the focus was 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 to 5, with 1 being the highest):

- On knowledge of central sustainable development themes and concepts:
   2.12.
- On attitudes favourable to sustainable development: 2.14.
- On behaviours supportive of sustainable development: 2.83<sup>3</sup>.

Although the study did identify a number of caveats, including the difficulty of identifying those specific behavioural 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 towards







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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.

Education for sustainable development requires all learners to reach their full potential. It involves students participating fully in the world in which they live, caring for and being responsible for their own lives, families, friends, and neighbours and using what they have learned at school to live a more sustainable lifestyle. Reaching these important goals requires all partners to adopt a co-ordinated systems-based approach towards learning for sustainability.

Carolee Buckler is the Sustainable Development Co-ordinator and Anne MacDiarmid is the Sustainable Development Consultant for Manitoba Education.

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### Education for Sustainability in Manitoba: What Should Be Done?

By Gary Babiuk and Thomas Falkenberg

In 2010 we, in collaboration with a team of university-based researchers and field-based research practitioners, completed an 18-month research study entitled Sustainable Development and Living through Changing Teacher Education and Teaching in Manitoba. This article is based on selected sections from the research report of this study (see Babiuk & Falkenberg, 2010). The first part of this article outlines foundational ideas that framed the research study, and the second part presents and discusses the report's recommendations and their rationales. The full report provides recommendations to the Manitoba government (Manitoba Education), school divisions, school-based educators, and faculties of education, and although all recommendations are interconnected, in this article, we limit our presentation to the recommendations to school divisions.

ustainability is not a problem of and for the planet Earth. Whatever humans do, the Earth will still function as a planet in some way. The problem of sustainability is a human values problem, because sustainability is about sustaining something, which is (at least in its major part) a matter of human choice based on values. When Lester Brown introduced the concept of sustainability, he used the phrase "sustainable society" and defined a sustainable society as one that is able to satisfy its needs without diminishing the chances of future generations to satisfy their needs (Brown, 1981). What a society's needs are—maybe with the exception of basic survival needs-is a matter of societal values. The problem of sustainability, then, is the problem of creating and sustaining the conditions for a particular way of human living for the current generation and future generations. Thus, the problem of sustainability is a human, a value, and a responsibility problem (responsibility toward future generations).

From the historical beginning of the development of the concept of sustainable development, the response to the question of what it is that needs to and should be sustained was seen as having to be a multi-strand response that considers the different domains of human living, like the natural, the socio-cultural, the physical (health) and the socio-economical domains. The notion of human well-being has emerged as an attempt to comprehensively capture the multiplicity of human needs that would need to be considered in responding to the problem of sustainability, so, for instance, in the Millennium Ecosystem Assessment (www.maweb.org), the Canadian Index of Well-Being (www. ciw.ca), or the Happy Planet Index (www.happyplanetindex.org).

Edwards (2005) identifies a widespread concern for sustainability in different disciplines and a shift in the way human living is conceptualized and lived to the degree that he speaks of a paradigm shift. This concern for sustainability in a wide range of disciplines has impacted all aspects of human living, for instance, how we work together as a community, how we undertake commerce, how we treat natural resources, how we design buildings, how we educate our children, and how we consider the biosphere. Drawing together the communalities in the new thinking across the different domains, he concludes that there are seven common themes across these domains that characterize the paradigm shift:

- Stewardship emphasizes the importance of establishing an ecological ethic for managing and preserving the biological integrity of eco-
- · Respect for limits calls for living within nature's means by preventing waste, pollution and sustainable resource depletion.
- Interdependence covers not only the ecological relationships between species and nature but also economic and cultural ties at the local. regional and international levels.
- Economic restructuring appears in many principles as a need for expanding employment opportunities while safeguarding ecosystems.

- Fair distribution speaks to the importance of social justice and equity in areas such as employment, education and healthcare.
- Intergenerational perspective emphasizes the need for a long-term rather than a short-term view to guide the critical choices facing society.
- Nature as a model and teacher acknowledges the 3.5 billion years of evolution of living systems and nature's significance as a reservoir of "expertise" (Edwards, 2005, p. 128-129).

We have conceptualized sustainability as a value and responsibility problem, which leads to *education* as the most promising institutional response to the problem of sustainability. The next section will briefly discuss some fundamental points around education for sustainability.

#### **Education for sustainability**

The report by the World Commission on Environment and Development (WCED, 1987) recognizes that "sustainable development requires changes in values and attitudes towards environment and development" (p. 111) and that education plays a central role in achieving those changes in values and attitudes as well as the skills and responsibilities that go along with those changes.

Others go further and suggest that the environmental and societal conditions for living sustainably require values, attitudes, and competencies that our current formal education system does not focus on developing but in fact are in conflict with those values, attitudes and competencies it currently does focus on (see, for instance, Orr, 1994, p. 27; Smith, 1992, p. 15). In the eyes of these authors, school education needs to be completely reoriented toward a fundamentally different purpose. The notion of ecological literacy (Capra, 1996; Orr, 1992) has been developed to conceptualize this paradigm shift in formal education, so, for instance, by the Schumacher College in the U.K. (www.schumachercollege. org.uk), the Centre for Ecoliteracy in the U.S.A. (www.ecoliteracy.org), and the Royal Roads University (Ecological Literacy Certificate) in Canada (www. royalroads.ca).

How can such a paradigm shift be addressed in school education in the Manitoba context? Based on the review of relevant literature and responses from Manitoba educators from a range of backgrounds, we derived a number of recommendations for education and educators in Manitoba that together address how such a paradigm shift might be accomplished. The next sections outline some of the recommendations for school divisions. (For a complete list of recommendations, see Babiuk & Falkenberg, 2010.)

#### Recommendations concerning education for sustainability

The first recommendation concerns the promotion of education for sustainability in Manitoba. One aspect of this recommendation addresses the need for reconceptualizing and clarifying our understanding of education for sustainability and educating all members of the school divisions across Manitoba for this imperative. The rationale for these recommendations is that we need to help educators understand education for sustainability in the notion of a multi-strand approach that includes the socio-economic, socio-cultural, health and well-being and not just the environmental aspect of sustainability.

The UNESCO schools pillars model would be one that could assist in this reconceptualizing. All educators need to be brought up to speed in the vocabulary, concepts and urgency of education for sustainability. Although this process has begun, as a provincial system, we still have work to do to bring about lasting systemic change.

Another aspect of this recommendation is the need for personal change to help provide an urgency and passion for moving our society toward sustainability through our work in education. The more holistic understanding of education for sustainability can help overcome the tendency to view nature as "other," as outside of daily human life. An Aboriginal perspective can help us reconceptualize our concern for the natural environment as our interconnection with it and as our responsibility to future generations or, as

some would suggest, our responsibility toward the earth that our grandchildren will inherit.

The second recommendation deals with the issue of whole-system change in education. One concern of the notion of moving to a sustainable living focus in education is the issue of adding more to an already full agenda and curriculum for school personnel, resulting in possible teacher burnout or the ignoring of education for sustainability for self-preservation. Thus, we recommend that education for sustainability become the overarching focus for all levels of education in Manitoba and that a small number of ambitious goals be adopted. Too many disconnected, fragmented and episodic projects undermine the chances of achieving the ambitious, long-term goals underlying education for sustainability so urgently need to be undertaken.

The third recommendation deals with the **issues of systems thinking.** As a human society we must model the underlying principles of ecological understanding and recognize the interconnection of all aspects of the living system in our societal organizations. We must model the natural systems. If we wish to bring about sustained change toward a sustainable future we must consider all aspects of education and understand that they are interconnected and must be considered together.

A particular area of concern from the perspective of systems thinking is the need to revisit funding formulas for school-based education under the notion of equitability rather than equity. A sustainable education system will need to address the needs of all but understand that some aspects of the system need more attention at this time than others. Overall, the research findings indicated a need for a commitment to a systems approach in our educational system.

The fourth recommendation encourages school divisions to undertake an audit based on the multi-strand concept of sustainability (socio-economic, socio-cultural, environment, and well-being) in order to establish the respective division's current state of implementation of education for

sustainability. Although Manitoba Education has been addressing this issue since the late 1990s and has become a leader in this area, there has been an uneven focus and implementation of the different strands of education for sustainability.

As we move to a systemic approach, the goals of education for sustainability need to be imbedded in school divisional strategic plans. The understanding of the multi-strands for living sustainably needs to be promoted to assist educators in integrating this understanding into the curriculum. At this time, much of the student and teacher efforts in the form of sustainability initiatives have occurred outside the classroom in extracurricular clubs.

The focus of our whole-school programs need to help our students learn the knowledge, skills and values of creating and living in a sustainable world. Our curricula must support the sustainable development of our communities through the teaching of knowledge, skills, and attitudes for sustainable living not just to our students, educators, and parents, but all members of our community.

#### Recommendations concerning professional development

Continuing with the systemic necessity of bringing about change, the first recommendation addresses the need

to strengthen the **school-university partnership for teacher development**. Although such a partnership has been in place since teacher education moved to the universities, the design of these partnerships has to fundamentally change and their goals have to support continuous teacher professional development with a focus on student learning in the area of education for sustainability.

The partnerships need to centre around the integration of pre-service preparation of teachers at the university and the ongoing professional development of teachers in classrooms. Such an integration, with a focus on education for sustainability, can strengthen whole-system educational change. The development of professional learning communities involving all educators would be a good starting point, an approach that many school divisions and schools across Manitoba have already begun to cultivate.

The second recommendation points to the need for focusing our curriculum on the notions of inter-disciplinary curriculum, pedagogy of inquiry, and systems thinking. The multi-strand notion of sustainability is grounded in a holistic, system-theoretical view of the world. This view also mirrors the systemic understanding of the earth and its ecological systems. We need to

move away from the silo nature of subject-discipline based curriculum. The study of topics around education for sustainability within the regular course of teaching can provide the foundations for all learning in the classroom and provide the substance for the development of all the literacies (reading, writing, numeracy, media, technology, artistic, etc.) that are the general goal of education in Manitoba. As students inquire and investigate sustainability topics, they develop the knowledge, skills, and attitudes outlined in the curriculum. Professional development and teacher education through professional learning communities must work toward assisting teachers with developing a pedagogy of integration, inquiry, and systems thinking in order to prepare their students to act for a sustainable future.

#### Conclusion

This has only been a brief summary of the recommendations and rationale for implementing the education for sustainability initiative in Manitoba and the professional development necessary to support educators in their efforts to move it forward. However, the recommendations for school divisions cannot be seen to stand alone, but must be considered as interconnected with those recommendations outlined for the province and teacher education at the university level. As was outlined, there needs to be a systemic approach to education for sustainability if we wish to move ahead in the last half of UNESCO's Decade for Education for Sustainable Development (see www.unesco.org/en/esd).

Thomas Falkenberg and Gary Babiuk are both professors in the Faculty of Education at the University of Manitoba with research interests in the area of education for sustainability.

For a complete list of references please contact editor Lara Schroeder at lschroeder@matrixgroupinc.net or (204) 953-3123.





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### **Looking Back to See Forward:**

# Sustainability from an Aboriginal Perspective

Little did we know as we grew up that we were learning a solid foundation of sustainability in a concrete and experiential manner.

#### By Sherry Peden

fter being invited to participate in the Manitoba Education Research Network forum on Sustainable Education held in November 2010, I spent considerable time pondering what "sustainable education" meant to me as an Aboriginal person. Although I could look to the literature (Cajete, 1994, 2000; Kundtson & Suzuki, 1992) and locate all kinds of academic discourse on the topic of Indigenous definitions regarding sustainable education, I felt that it was most important that I examine my own upbringing, that is, look back at my learnings so that I could envision and perhaps articulate a definition of what sustainable education means for the future. It behooves me to share some of my upbringing so that perhaps you can understand what I am talking about in my journey of looking back as a means to looking forward.

I was raised some eight kilometres northeast of my mom's home reserve, Tootinawazaibeing Treaty Nation, which is located on the southwestern face of the Duck Mountain Provincial Forest, a crown land buffer to the Duck Mountain Provincial Park. What I consider home was, in fact, what many would call a "dirt farm" in that my Dad used to say his most prolific crop was stones. Being raised on a subsistence farm bordering the bush meant that we kids were taught the value of hard

work and to believe that education was a means to give us individual choice in our lives because we were supposed to become independent.

More importantly, we were taught that having an education would enable us to care for ourselves so that we were not dependent on anyone, that we would have the skills to be able to feed ourselves and to choose our future. We also learned that we had a responsibility that went beyond ourselves as individuals in that we were connected to a larger entity, that of family, community, nation and world. This connection meant that not only did we have a responsibility to learn independence but also that we had a responsibility to give back as well as to help care-take the family, the community and the world.



#### The relationship to education

So, you may be wondering what that means in terms of education, as we usually think of schools and classrooms? Growing up on that dirt farm meant that we were taught by doing, what pedagogues would term "experiential learning," and through stories. We did not have electricity so we did not learn from television; we learned by hearing the stories from our parents. For example, we grew, harvested and preserved over 90 per cent of our food and, by doing this, we were indirectly taught the values, knowledge and laws associated with responsible and sustainable farming practices. We learned that if we did not give back to the garden plot by adding the manure and old leaves, we would most likely not harvest much and we would go hungry.

When we ventured into the bush each summer to pick wild raspberries, saskatoons and cranberries, we learned the life cycles and habitats of the plants and animals that co-existed with us on that little mountainside. When we got home, we learned how to preserve the berries for the winter food supply. As we did this, we learned what is known today as safe food handling. As kids, we used to begrudge that Mom seemed to hoard the wild raspberry preserves; the only time during the year that we got to eat wild raspberries was if we were sick. When we grew older, we learned that Mom was in fact not hoarding but using the medicinal value of the wild berries in what could be termed a Tylenol substitute for pain and fever.

Mom and Dad harvested wild game—deer, moose, elk and some chickens—as our primary protein source. I don't recall eating beef until after I left home as it was always considered a delicacy because it was "store bought." By watching my parents harvest, butcher and preserve meat, we learned about the life cycles and the biology of animals. We learned that these cycles had to be respected, not merely to placate the game warden but because if the appropriate times to harvest or hunt were not respected, then there would be no animals for the next year. Little did we know as we grew up that we were learning a solid

# This kind of education links us to what the Elders say "is necessary for real life—the ability to know how to feed oneself."

foundation of sustainability in a concrete and experiential manner.

We also learned about recycling and reusing. From an economic stand-point, we were raised well below the poverty line. Mom made almost all of our clothes, coats and bedding. There were some people from town who used to give mom boxes of their old clothes. Mom would take these garments apart and recut, resew or reknit them to make us kids our pants, tops, coats, mitts and scarves. Mom wanted us to be independent so she also taught us how to reuse, sew and craft almost anything that might be required in a home.

#### The carry-over into adulthood

Basil Johnston, a prominent Aboriginal author who talks about the value of stories as an instructional technique, stated that, "for our ancestors, the lessons they wanted to pass down to their descendants [us kids] were meant to bring about growth of heart, mind, spirit and the senses to provide youth with the means to meet the challenges of life" (2010, p. 11). To me, this particular passage reflects both a sense of what sustainable education means as well as a strategy for meeting those goals with the students in our charge. Johnston's scholarship makes sense to me now as an adult and interestingly enough, we often go about and do things without knowing why we do them or why we value doing these activities.

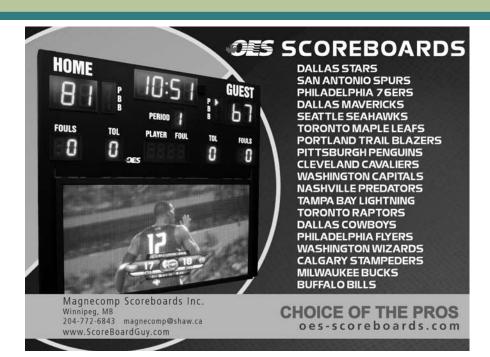
I have what many would term a "wilderness cabin" or, as the green technology folks would call it, an "off-grid cabin" on the land where I was raised. We, meaning my husband and I, choose not to have electricity put into the cabin. We heat with the deadfall wood that we find all over the property. We use

a propane stove to cook and a propane fridge to keep our food. We spend 60 to 75 days there over the course of the year, and yes, even go in the winter time. My husband and I built, or should I say, continue to build, this 650-square-foot cabin using primarily recycled materials. We grow a huge garden and have a variety of domestic and wild fruit trees and bushes.

Although we both believe in higher education, we feel that the education learned by living in the absence of electricity, telephones and television for parts of the year is also an important education because this kind of education links us to what the Elders say "is necessary for real life-the ability to know how to feed oneself." My son and his friends have always enjoyed being at the cabin because there we can play cards and flashlight tag at night, watch the stars, look for animals, look for tracks, take pride in the food we have produced or harvested and maybe even see the bear that has a den about 180 metres from the cabin. As I think about it, we live sustainable education at our cabin.

#### The relationship to sustainability

So what is sustainable education? I'd propose that it is about guiding, leading or mentoring our students so that they are self-sufficient and know how to give back, not only to the people but also to this land. The challenge that I see in 2011 is that we may need to rethink and perhaps even reconfigure what education means to us at an individual, organizational and national level. And, in rethinking what we might do and how we might do this, we may need to examine and address some tough or controversial issues at both a personal and professional level.





These issues may include the long-term effects that the chemicals being used in our fields, in the packaged food that many people eat, on the roads and in even in our homes are having on our personal health, the air we breathe and the water we drink. We may need to examine the role that large corporations such as Monsanto, Viterra and Pfizer are having on our individual and collective futures, while at the same time acknowledging that much of the agriculture economy in southern Manitoba is dependent on these corporations. We may need to examine the role of consumerism and its impact on the world.

And then, we may need to examine how we can make what is done in schools more meaningful and relevant to children so that they, the keepers of the future, can play a more responsible role than the one our generation has played in the sustainability of the world. Perhaps we could harness some of the technology in ways that allow students to develop research skills for specific topics.

For example, one of my pet peeves is that I drive by all kinds of schools within the course of a year and seldom see a garden on site. This continues to astound me because southern Manitoba is considered to be one of the most prolific growing areas in Canada—yet we are not using our local environment as a teaching resource for our children. There are more and more children who do not have a direct connection to farms because of either urbanization or





immigration; therefore, we educators should be developing our curricula in order that all children get an opportunity to experience independence in terms of food production, harvesting and preserving.

Why could we not utilize place-based education as described by Traina and Darley-Hill (1995), who describe education as extending the "locale to include bio-regional education by encouraging students and teachers to know their place and to consider the impact of lifestyles on the resources of that bioregion"? We could adapt our schools to involve both the students and the community members in relevant projects where all of those involved would benefit

For example, students might research the effects of food additives, fertilizer or pesticides on health. They could then design an action project that would decrease these additives. The project could potentially include developing a local garden, something like what the school in Wabowden, Man., is doing,

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where the students would learn how to plan a site, plant (science), work cooperatively (social studies), harvest and preserve food (mathematics, nutrition and health), and seek help from the old people in the community who could act as teachers (respecting the traditional knowledge of the Elders and the community).

Woodhouse and Knapp (2001) identified a place-based education as one that: emerges from the attributes of a place; is multidisciplinary; is experiential; is reflective of an educational

philosophy that is broader than learning to earn; and connects place with self and community. School projects that extend beyond the classroom walls are relevant, involve community, build community but more importantly, teach students those critical skills and knowledge that is needed for their individual and collective health—sustainable education.

Sherry Peden is a doctoral candidate and also teaches in the Department of Teacher Education at Brandon University.



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### **Building a School**—For and As Learning

Hanover School Division is located southeast of Winnipeg and is now Manitoba's largest rural school division, with 7,500 students in 17 schools. A recent wave of immigration has led to rapid growth in both numbers and diversity, and the recent planning and construction of Clearspring Middle School in Steinbach is providing plenty of opportunities to create an exciting, flexible and healthy environment that will enable 21st Century learning for middle school students. With a new focus on "School as a Learning Tool," the entire process of planning and construction of the school and the school building itself are being designed to provide exciting and authentic learning for Hanover School Division students.

t is often noted that if someone from an earlier age would travel through time to a modern school, they would still immediately recognize it as a school. Education has long been based on an industrial model that required "factory" schools—school buildings were referred to as the "Halls of Learning" and were built to house learning, not necessarily to enhance it. With a recent emphasis on authentic and engaging learning, many educators have been advocating "learning beyond the walls" of the school building itself. The concept of designing a school building as itself a learning tool challenges us to learn from the walls themselves, as well as from the heating system, the structural supports, the windows, and any other working part of the structure.

Robert Starratt (2004) believes that ethical educational leaders "have a major responsibility for cultivating a rich, stimulating learning environment for all students, an environment that is flexible, responsive, encouraging and diversified" (Starratt, p. 60). This environment fosters authentic learning that is interesting to the student, connected to something meaningful in the community, and important in the life of the student and the community. The responsibility to provide such an environment carries with it some important ethical implications for the planning and design of a new school building and site.

Rapid growth in Hanover, along with the urgent need to move students from portable classroom villages into permanent space, could have favoured practicality and expedience over imagination and possibility, potentially leading to the creation of another "factory" school. Instead, we determined that our foundational decisions should ensure that the new school would support a flourishing "lifeworld" characterized by authentic and meaningful learning.







ABOVE: An architect's rendering of what Clearsping Middle School's "town square" might look like, viewed from the tiered seating area.

TOP LEFT: Students and staff observe as the architect discusses a Clearspring Middle School design submitted by a middle years student group.

BOTTOM LEFT: A middle years student group works on developing their unique school design.

#### A sustainable plan

From the beginning, the school division, the Public Schools Finance Board, and the architects agreed to pursue the Leadership in Energy and Environmental Design (LEED) Gold standard. This involved using the Integrated Design Process (IDP), a highly collaborative process allowing as many voices as possible to be heard.

Together we identified stewardship and social responsibility as our guiding principles, with project drivers of sustainability and durability, liveability, engaging and flexible learning spaces, and a strong connection to the community. The result will be a healthy and safe building with natural and full spectrum lighting, appropriate acoustics, and low emitting materials that are regionally produced or recycled and environmentally friendly throughout their life cycle, including cleaning and maintenance. Flexible learning spaces will include "street corner" alcoves in each classroom cluster and a town square with bleachers

at the entrance to the main street, which runs the length of the school.

A master landscape plan for the school site envisions a variety of outdoor learning areas that will be developed by students and staff as authentic learning tasks. Water-efficient landscaping will promote on-site storm water management, while fostering natural insect and bird life.

The LEED report card offers an innovation credit for designing the school itself to be a learning tool. Hanover School Division eagerly embraced this unique opportunity to create maximum learning opportunity for our students out of what might otherwise have been a distant process, involving architects and engineers in an office far away, with very little relevance to the students for whom the school was being built.

From the very beginning of the planning process, HSD welcomed a "School as Learning Tool" teacher co-ordinator to join the divisional team. This co-ordinator was present at all Integrated



ABOVE: An architect's rendering of what Clearspring Middle School might look like.

Design sessions, allowing him to provide valuable input to the architects at every stage of the design, as well as to take away ideas for learning which could be used by teachers and students. A "Schools of the Future" website was created, linked to our divisional home page to share the entire process and our learnings with our students and teachers and for that matter, with anyone in the world. A wiki space, open to the all, was created to encourage teachers to collaborate with each other and with their students on learning ideas related to the design of the school.

The architect team led focus sessions that provided opportunities for divisional principal and teacher representatives to have direct input into the planning process. A community forum gave members of the public an opportunity to hear about and view details of the project, as well as to dialogue with divisional staff and the design team. A unique consultation session with student representatives involved spending an afternoon designing their own school in multi-grade teams, putting together trueto-scale cutouts of all the spaces in the school. They then placed their school on a site plan laid out on the floor and presented their design to the project architect. It is anticipated that students and teachers will be equally involved during the 15-month construction phase.

#### What to expect

And when the school opens its doors in September 2012, the school building itself will become a valuable learning tool. Mechanical and electrical systems will optimize energy performance, and students will have access to monitoring systems that will provide data for their authentic learning. Cutouts will allow students to observe working mechanical systems. Structures will be left exposed in strategic places and labelled for student reference. The original street grid

of Steinbach, reproduced to scale, will be illustrated in the tile pattern in the main "town square" area and down each hall-way or "neighbourhood street," allowing students to do orienteering, mapping and measuring in their own building, while learning about the history and culture of their own place.

Each of the four smaller learning communities in the four different classroom hallways of the school will be identified by a unique accent colour in the floor tile of that hallway. When combined with the two base school colours, each learning community will have the basis for a unique tricolour flag for their community. Core values of the school will be symbolized by each of the school colours and each community will attach a community value to their colour. In this way, the interior design of the school can serve as a constant reminder of the underlying values of the school and of their community and further enhance the social responsibility and sustainable futures themes in divisional and school priorities and plans.

The school itself will become a walking field trip destination for other division students and will serve as a rich resource for many areas of the curriculum. In collaboration with Manitoba Education, an HSD team of middle years teachers from a variety of subject and specialty areas will be tasked with developing a curriculum or learning guide, based on the various architectural and design elements that have been purposefully integrated into the building and the site. It is hoped that this curriculum guide will provide authentic learning ideas for teachers and students in other schools within and beyond the school division.

The new school will enrich our understanding of social responsibility with a new focus on education for sustainable development. We hope that it will contribute to a broad, overarching vision for students, teachers, support staff, and all members of the school community to become responsible and active community and world citizens and that it will serve as a model for responsible and sustainable use of resources and a commitment to healthy living.

#### **Final thoughts**

More than 50 years ago, Hannah Arendt made one of the clearest and most compelling ethical connections between education and sustainable development when she wrote: "Education is the point at which we decide whether we love the world enough to assume responsibility for it and by the same token save it from the ruin, which except for renewal, except for the coming of the new and young, would be inevitable. Education is the point at which we decide whether we love our children enough not to expel them from our world and leave them to their own devices, not to strike from their hands their chance of undertaking something new, something unforeseen by us, but to prepare them for the task of renewing a common world (Arendt, p. 196)."

For pictures, videos, and information on this project, see www.hsd. ca/schoolsofthefuture/index.php. A wiki will provide an interactive site for teachers and students to share their learning as the project unfolds. Our hope is that learning related to this project will go far beyond what we have even imagined.

Ken Klassen is the Superintendent of the Hanover School Division in Manitoba.

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### **Learning Today to Improve Tomorrow:**

### Education for a Sustainable Future in Evergreen School Division By Paul Cuthbert



ABOVE: Gimli High School Family Studies 30/40 students make Touch Quilts for residents of Betel Personal Care Home with dementia or Alzheimer's disease.

RIGHT: Gimli High School students spend a period with Grade 3 students taking part in activities in the gym at Sigurbjorg Stefansson Early School.





LEFT: Riverton
Early Middle School
Grade 7 students
Geocaching Course
using GPS units.

School vergreen Division is committed to the principles of education for sustainable development within its new foundations and strategic direction. Our vision, "Learning Today to Improve Tomorrow," describes what we strive for, providing our students with an opportunity to create a promising future for themselves, our communities and the world. Our new mission, "Evergreen School Division will engage students in learning to become contributing citizens of a democratic society," articulates what we aim for in our day-today work to help us improve tomorrow.

For the past decade, Evergreen School Division schools have been implementing recycling programs and other environment-based initiatives. While these were worthwhile learning opportunities for students, we recognized that we needed a more systemic approach to sustainability that infused the three pillars of environment, society and economy.

As a result, an Evergreen team attended the Sustainability Education Academy in November 2008. The Sustainability and Education Academy is a collaborative program between Manitoba Education, the Schulich School of Business, Faculty of Education, and the UNESCO Chair on "Reorienting Teacher Education" at York University, and Learning for a Sustainable Future. Our participation at this leadership academy resulted in the development of a comprehensive systemic plan for sustainability in Evergreen School Division. This plan was adopted by the Board in 2009 (see sidebar, next page).

The following actions have been taken since the implementation of our sustainable development plan:

- Summer Institute Workshops on ESD for teachers in 2009 and 2010.
- ESD Division Workshop with Chuck Hopkins (UNESCO), Brian Kelly (SEdA) and Anne MacDiarmid (ME) with all professional and support staff (2009).

- New Board Policy—Sustainable Development (2010).
- Facilities and operations audit (2010).
- Committees established:
  - » Education for Sustainable Development Committee.
  - » Facilities and Operations Committee.
  - » Staff Wellness Committee.
- Financial support for ESD in all schools (ESD grants, student engagement grants).
- All Evergreen schools achieved EcoGlobe status in 2010.
- Youth forum "World of Water" for grades 4, 6, and 8 students (2010).
- Appreciative Inquiry Workshop for teachers on sustainability, citizenship and engagement.

Evergreen School Division has identified three priorities in its 2010-2013 Strategic Plan—Citizenship, Student Engagement, Sustainable Development. The plan articulates the following goals:

1. Students will become informed and responsible decision-makers, playing

#### **Evergreen School Division Sustainable Development Plan**

Evergreen's Sustainable Development Plan involves the four domains of Governance, Education for Sustainable Development, Human Resources, and Facilities and Operations, and includes the following action areas:

#### **Governance**

- Sustainable development established as a priority in Division Strategic Plan.
- Division foundations that have direct links to sustainability.
- · Board policy development.
- · Committees.
- Budget.
- · Community partnerships.
- · Evaluation and monitoring.

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

- · Cross-curricular focus of ESD in all subjects.
- Problem-based learning focused on ESD.

active roles as citizens of Canada and

The team uses an action research model based on the following guiding questions.

In our ongoing efforts to make learning experiences more relevant and engaging:

- "In what ways do our/might our 'classroom' teaching and learning experiences deliberately aim at developing contributing citizens of a democracy?"
- "In what ways do our/might our 'classroom' teaching and learning experiences deliberately aim at developing the knowledge, skills, attitudes and life practices that contribute to a sustainable future?"
- "How do we/might we overcome systemic barriers to the provision of these relevant and engaging learning opportunities?"
- 4. "How do our/might our assessment practices contribute to these relevant and engaging learning experiences?"

The framework aims to honour the voice and experience of teachers. It also acknowledges complementary research and accesses the voices of students and community members. In other words, the team invites teachers to share current and planned practices in an effort to enhance collaboration and success in the pursuit and realization of the Evergreen's priorities and foundations. In this way, pedagogical discussions throughout the division will be characterized by a collective pursuit of shared goals, and a wealth of exemplars will be available to inspire "improved" practice within our schools.

The team aims to contribute to the development of Evergreen's *living* 

- Pedagogy focused on systems thinking, inquiry, active learning, futures thinking, problem solving from a local and global perspective.
- · Connections to student engagement and citizenship.

#### **Human Resources**

- Professional development provided for professional and support staff.
- Education for Sustainable Development practices profiled.
- Succession planning.
- Staff wellness plan developed and programs implemented at each work site.

#### **Facilities and Operations**

- · Facilities and operations assessment.
- Facility renewal plan developed based on LEED or equivalent standard.
- Operations plan developed that includes actions in procurement, energy efficiency, water conservation and waste reduction.
- School structures and outdoor spaces are "facilities that teach" sustainability practices.
- Sustainable transportation plan.

- the world, and will contribute to social, environmental, and economic well-being and an equitable quality of life for all, now and in the future.
- 2. Students will be engaged in relevant learning experiences.
- Students will acquire and demonstrate knowledge, skills, attitudes and life practices that contribute to a sustainable future.
- Schools to provide students with in and out-of-school learning experiences and to develop their understanding and demonstrate examples of citizenship.
- Participatory/social justice citizenship is a key element of curriculum and pedagogy and students have opportunities to demonstrate their learning of what it means to be a contributing citizen in a democratic society.
- Operations, activities, programs and facilities will be sustainable. Design, construction, renewal of buildings for management, procurement, resource use and transportation will be informed by sustainability principles.

The following excerpts highlight some education for sustainable development initiatives in Evergreen.

#### **Teacher action research teams**

In co-operation with the Manitoba School Improvement Program, a team of Evergreen School Division teachers (K-12) are currently engaged in exploring pedagogy through action research in the area of education for a sustainable future.

portfolio. The work of the Teacher Action Research Team is intended to be shared divisionally, in the form of teachers sharing their work with fellow teachers in an attempt to amplify the exceptional efforts of our students and staff.

#### Water Action Project at Riverton Early Middle School

In fall 2010, the Grade 7 class at Riverton Early Middle School participated in a R4R Water Action Project to increase their awareness of the local environmental concerns that are present in the Riverton community. The students developed a geocaching course within the community. With the support of the Project Flow grant, the school purchased Garmin eTrex Handheld GPS units. Students chose nine different historical and/or environmental locations and created their own personal geocaching containers. Students learned how to use handheld GPS units, locating items and marking points of reference for their course. Students chose locations, researched the information, and marked co-ordinates for the locations. They uploaded it on a Wiki and included three environmental tips at each site dealing with natural resource conservation.

Once they completed the containers and the website, small groups of students went into the community, visiting each site. The students took a deep interest in the project and gained significant insight into their community and the environment around them. They connected with the past, and class discussions

revolved around different environmental issues affecting their community. The students will continue to update their site containers and website, and they will have ongoing opportunity to use the GPS units. In spring 2011, they plan to add tracking items by way of the internet.

#### Building Aboriginal student success at Riverton Collegiate

This program supports the transition of Aboriginal students into the RCI high school program and the community of Riverton and fosters school success. For most, a move to a new community has a profound impact on their entire lifestyle. Left to their own devices, some students manage well, but many others find the challenges too great—and often feel that they have no recourse but to drop out of school and return to their community. The northern non-resident (NNR) student program at Riverton Collegiate has recently taken steps to address many of these issues.

Through the support of Evergreen School Division and the Aboriginal Education Directorate, a community liaison position was established to forge stronger links between all partners. Strategies were developed to deal with the most pressing issues related to supporting these students and ensuring the long-term viability of the program: a school-initiated course easing entry into the regular school program; home placements; workshops

to heighten cultural awareness among all RCI students; a close partnership with the First Nations community through visits to northern communities, open house visits at RCI and regular contact with education co-ordinators; academic supports to support skill development; and aboriginal language workshops (Ojibway).

#### **Education for sustainable development at Gimli High School**

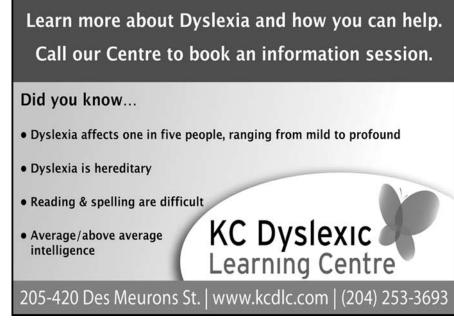
It is becoming more difficult for residents, some of whom are working two or more jobs, to remain in Gimli, given the lack of affordable housing. The Social Justice Committee attended the Eco-Village presentation to town council about this issue. Sustaining the livelihoods of our population and the Charter right to mobility is of essence here. The Social Justice Committee also has ongoing involvement with Evergreen Basic Needs (Trick or Eat and Christmas Hamper programs) to support an organization that attempts to build sustainability in the community. The efforts that the school and the division are making to buy fairtrade products builds sustainability in citizens and are supportive of making people sustainable worldwide.

The Enviro Club hosted their second annual "Eating Lower on the Food Chain" dinner in early December. This is a community evening event featuring vegetarian and vegan selections, from entrees to desserts. Information was presented to attendees to encourage more sustainable eating practices. Enviro Club students are also planning a fashion show this spring to provoke thinking about our consumer choices. Students are reworking "old" items, creating new items from organic and other materials and restyling items such as jewelry in an "eco chic" approach. Funds generated are intended to raise awareness of concerns about the tarsands and their effects upon wildlife and human health and well-being.

The Gimli High School Key Club sold grown-in-Manitoba vegetables from Peak of the Market as a part of the Healthy Farm to School fundraiser. The profits from the sales are donated to Camp Kan Do. People also purchased vegetables and donated them to Evergreen Basic Needs and Peak of the Market donated an equal amount of vegetables to Winnipeg Harvest. Sewing for Santa made 41 Hot Dog pillowcases which were donated to Evergreen Basic Needs for the Christmas hampers. Key Club paid for the cost of the fabric and thread for the pillowcases and the students made them at lunch. Key Club also collected donations for the Christmas hampers and eyeglasses for the Lions. Scrap fabric is collected in the home economics classroom and donated to a quilting group in Portage la Prairie that uses it for bedding for the dogs at the animal shelter.

#### Sustainability at Sigurbjorg Stefansson Early School

SSES is eagerly anticipating having their new greenhouse operational in March. Teachers are using some of their PLC opportunities to design hands-on learning experiences and inquiry-based projects for our student engagement initiative. There are plans to work collaboratively with parents, community volunteers and businesses, the high school Environment Club, and local horticulturalists. Planting vegetables to harvest and prepare for students to sample and planting poinsettias to give to parents as Christmas gifts are being considered. Compost material that is currently being collected at the school will be mixed with the planting soil. Recently purchased high-powered microscopes will be put to use in our greenhouse and outdoor classroom. This initiative will help to cultivate a culture of innovation in our



school while ensuring that students are involved in highly engaging, meaningful, and relevant learning experiences.

#### **AEMYS Environmental Club**

AEMYS Environmental Club, now in its second year, champions environmental sustainability at Arborg Early Middle Years School. In its first year, the group worked to implement a composting program and improve the recycling program at the school. This group has developed a schedule where different members take turns going to classrooms to take out the composting and recyclables. This year, the group is promoting litter-less lunch days, lights out, and other environmental conservation ideas to teach everyone at the school how to reduce our carbon footprint. Their largest project is a school greenhouse that has been erected and is ready to be used in spring 2011. The greenhouse will provide students with an opportunity to learn about gardening in a hands-on manner.

#### Dr. George Johnson School—bridging the generation gap

Since 2008, students have been making a monthly visit to the local Betel home for seniors to read with the residents. The experience has been a revelation for both groups, but especially for the students. In exchange for the stories they shared in book form, many of the seniors shared the stories they have gathered from a rich lifetime. "The things we have studied at school—like World War Two—they have actually lived. It's really amazing to listen to them," one student said.

Each year, Dr. George Johnson School reciprocates the hospitality when Betel residents visit students at the school. At Dr. George Johnson School, the senior and student relationship is only one example of Education for Sustainable Development, but perhaps the most rewarding for both parties as they bridge the generation gap.

#### **ESD** develops good citizens

Evergreen School Division believes that education for sustainable development is about developing good citizens; citizens who know how to critically assess different perspectives; citizens who examine social, political, and economic issues and explore strategies for change that address root causes of social and environmental problems and social injustice. Good citizens are critical thinkers who think about fairness, equality of opportunity, and democratic engagement.

Education in the 21st century can continue to evolve at a comfortable pace that is entirely out of step with the leadership that is needed to embrace sustainability education, or we can engage in a deeper critique and broader vision for the future. While there have been many efforts to integrate sustainability concepts

into curricula, education for sustainable development has never really gained the level of importance that is necessary to transform public education in order to provide our students with the knowledge, skills and attitudes necessary to develop a sustainable society and planet. The scope of education for sustainable development embodies the very purpose of education itself and must be modelled by all in the system.

Paul Cuthbert is Superintendent of Evergreen School Division.

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### **Green Collar Prep School:** Introducing Students to Careers in Alternative Energy Manitoba's newest wind farm development is rising out of the farm fields surrounding the community of St. Joseph in Border Land School Division. 28 MASS Journal Spring 2011

#### **By Harvey Giesbrecht**

echnical vocational education is often seen as delivering basic programming that will help students acquire skills for careers in traditional fields of employment. However, with the focus in education on equipping our students with skills for "careers that haven't been invented yet," educators in the technical education realm have been working on non-traditional program options for students that will help them prosper in a changing economy and a changing world.

#### **Border Land develops program**

Border Land School Division is in the process of developing an approved Technology Education program focused on technical careers in the alternative or renewable energy sector, green collar jobs for the green economy. With Manitoba's newest wind farm development rising out of the farm fields surrounding the community of St. Joseph in the western end of the division, it seemed the time was right to explore potential program options related to this significant investment in the future. What resulted was a commitment to develop an activity-based program designed to teach Manitoba high school students about career pathways in the alternative energy sector and help them to acquire hands-on technical skills and knowledge for jobs in this emerging

Border Land School Division is developing this program as a partner within the Red River Technical Vocational Area. This is a partnership of south central Manitoba school divisions dedicated to shared access to technology education programs across divisional boundaries at seven locations in the region. The other partners include Garden Valley School Division, Red River Valley School Division, Western School Division and the Division Scolaire Franco-Manitobaine. Work is underway to have the induction course for the program ready for students in the RRTVA for the 2011-12 school year with the rest of the program coming online for the 2012-13 year.

#### The program

The vision for the program is to have up to nine credits available to students

with a transition from awareness to skills acquisition and career path options. Each course in the program will emphasize activity-based learning but focus on different aspects of energy.

The first credit may be offered as a stand-alone elective similar to a Current Topics in Science credit or may be used as an introduction course for the rest of the program. Units in this first course will include topics on:

- Energy auditing to help students gain an understanding of our energy consumption patterns and knowledge of the tools used to gather the information that establishes our energy footprint.
- Knowledge of current energy sources so students understand what constitutes an "alternative."
- The impact of our local choices of production and use of energy on larger global issues. This includes, among other things, production methods, means of consumption, cost and distribution.
- An overview of the fundamentals of at least four types of renewable/alternative means of energy production. The four areas currently targeted are solar, wind, geothermal, and biomass fuels.

This first course will be capped with a summative activity that allows students to demonstrate their knowledge of developments in this field either on the technical or geopolitical side of this technology.

Should a school decide to pursue the full program, the next four credits in the cluster are designed to focus specifically on a detailed technical understanding of each of the four energy sources explored in the introductory course. Four 110-hour Technology Education courses will allow students to acquire the knowledge and introductory technical skills needed in the production of electricity using solar or wind installations, bio-fuels from renewable sources, or geothermal technology. The learning outcomes will be designed to accommodate changing technology. If a particular technology should become obsolete, another may take its place in the program, keeping pace with the rapid advances in this field.

The final four program credits are designed to allow students to gain intensive workplace-based exposure to technology

in the field. These credits will rely heavily on mentorship opportunities using community resources. An internship-style approach to this part of the program will put students in touch with community businesses already engaged in the development and installation of alternative energy systems in our communities.

#### **Further partners in this undertaking**

Additional support for this project has come from the Technical Vocational Initiative, which is jointly sponsored by Manitoba Advanced Education and Literacy, Manitoba Education, and Manitoba Entrepreneurship, Training and Trade.

Further input has come from Green Manitoba, a special operating agency of the Manitoba government serving as an access point to acquire information about provincial sustainability issues. Partnerships are also being pursued with post-secondary institutions and the energy industry both on the conventional and the new and alternative side, as this program touches on all aspects of energy in some way.

#### A new economy

As much as we all desire a quickfix approach to improving our energy efficiency, it is obvious that this change will be incremental and the technical skills required to create a new, more energy-efficient infrastructure will need to be developed as the technology changes. As we improve new construction/consumption methods, retrofit current infrastructure to meet higher efficiency standards and take advantage of new sources of clean, renewable energy, we will develop a new economy in this field focused on research, manufacturing technology and the installation of new forms of energy systems. This program will allow our students to become leaders in the technical aspects of creating a cleaner, more durable energy system from which we will all benefit.

Harvey Giesbrecht is Co-ordinator of the Red River Technical Vocational Area and leads the Alternative Energy program development team.

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### **Down the Drain:**

Bio-Swales, Rain Gardens and Natural Playgrounds in Pembina Trails School Division

#### **By Graham Bruce**

From our largest school in the division to our smallest, students are engaged in sustainable activities and projects.

ducation for sustainability (ESD) continues to be an integral part of educating young people in Pembina Trails today. Protecting and living more harmoniously with our environment is perhaps the most recognized area of sustainability; however, social and economic aspects are equally important.

In the area of environmental education, Pembina Trails educators have provided opportunities for students to work beyond the classroom and normal curriculum by using the lakes and water resources in the city and the surrounding areas. In winter, middle years students walk from their school at Henry G. Izzat to Fort Whyte Alive, an urban education centre of woods and lakes. Here they have worked with scientists who have examined the effects of climate change on ice conditions in the Arctic. Students use similar experiment techniques to study core ice samples drilled from the lake at Fort Whyte. Winnipeg is ideally suited for this kind of student study with feet of ice covering the lakes in the winter months.

One hour north of Winnipeg in Gimli, students board a Lake Winnipeg research vessel to observe and work with the research team studying the quality of lake water. In the summer, large algae blooms and swimming beaches closing for brief periods due to poor water quality give this learning opportunity immediacy and relevance for the students. Students at Linden Meadows Schools produced *The Sacred Lake*, a DVD that highlighted the need to protect this body of water. *The Sacred Lake* was shown at the Gimli Film



Festival. Climate change and growing environmental pressures make the continued study of the quality of Manitoba's water an essential area of student focus.

Poverty project.

The Sustainable Development Committee at Vincent Massey Collegiate has raised funds to place a wind turbine and solar panels on the roof of the school. They have completed Phase 1 of a project that will also see the building of a greenhouse built to grow vegetables for use in the school cafeteria, composting of waste, and use of rainwater. The student committee also organized a conference on sustainability for over 1,000 of their peers as well as launching their own Sustainable Development Committee website.

From our largest school in the division to our smallest, students are engaged in sustainable activities and projects. The 81 students of Chapman School have completed over 1,000 activities and projects and have earned Earth School status in the SEEDS Green Schools Canada program.

There are 8,000 elementary schools in Canada involved in the program, however, only 261 of those schools have achieved Earth School status.

Fort Richmond Collegiate has a longestablished Wetland Centre of Excellence a few miles outside of the city at Kelburn Farms. Here high school students work with grades 4 and 5 students from the division's schools. Under staff supervision, all of the students' activities are led by the high school students and designed to show the importance of protecting our wetlands. Learning activities include the Marsh Metaphor Game, Critter Dipping, where students find and examine the marsh's inhabitants, and the Biodiversity Walk, which helps students understand the Red River, the idea of a watershed, seasonal flooding and how climate change plays a significant role.

At many other schools, students have worked at enhancing their green spaces by planting trees, developing rain gardens, constructing outdoor classrooms, creating butterfly gardens, growing vegetables, and creating new play spaces and structures. The work has been supported by our Evergreen consultant Wendy Simonson who not only works with students and staff, but also provides parent workshops in the evenings. At Acadia, a beautiful outdoor turtle classroom was constructed using stone from the Whiteshell, rocks from Aboriginal sweat lodge ceremonies, logs and other natural materials to create a special space for teaching, study and meditation.

#### The Down the Drain Project

The Down the Drain project at St. Avila was begun to address a playground and field area that was consistently under water in the spring and after heavy rainfalls. Rather than simply drain the area, a multi-faceted plan was developed, which focused on water conservation and water stewardship. With a small amount of divisional funding as seed money, Janice Lukes, a parent at St. Avila, developed a \$500,000 project to develop an innovative and effective drainage solution called a bioretention system. Federal, provincial, city, and business partners all contributed to the project to truly make it a community initiative. Work on the 14-acre site began in spring 2010 and although much of the groundwork and structure work has been completed, the site will continue to mature as plants, shrubs and trees grow and develop.

The key features of this innovative system are bio-swales, rain gardens and turf. Bio-swales are drainage courses with gently sloped sides (less than six per cent) that are filled with vegetation, compost and/or riprap. The water's flow path, along with the wide, shallow ditch, maximizes the time water spends in the swale, which aids the trapping of pollutants and silt. Rain gardens are planted depressions designed to absorb rainwater runoff from impervious surfaces like roofs, driveways, walkways, and compacted lawn areas. Storm water is allowed to percolate into the ground. A new species of native prairie grasses developed by Native Plant Solutions (a division of Ducks Unlimited) was used to cap the soil. Native grass species are the clear choice for environmental stewardship as they provide long-lived,



low-maintenance and aesthetically pleasing ground cover in a wide range of environments. Properly installed, native grass species typically require very little to no fertilizer and water inputs.

Bio-swales and rain gardens are an integral part of the "Natural Playground" at St. Avila. The playground incorporates elements such as topography (as seen in berms, stone walls and natural amphitheatres), plant groupings of indigenous trees, shrubs, flowers and grasses to attract wildlife and provide year-round interest, movement corridors, sun paths and weather patterns, drainage courses and water features, and play structures made primarily of natural materials, including benches, bridges, arbours and pathways, to create engaging, safe, accessible and age-appropriate play areas.

While the St. Avila Down the Drain project is the largest in the division, other schools, inspired by the project, are developing their own natural playground proposals and launching fundraising campaigns with their local communities. To help these larger projects get off the ground and rather than distribute a small amount of funding to each school, divisional funds for sustainable development and the middle years experiential grant have been pooled.

#### **Empty Bowls and Brush Out Poverty**

The most recognizable area of education for sustainable development is usually environmental but two other important areas feature prominently in work in Pembina Trails. Empty Bowls and Brush Out Poverty bring together the social and economic aspects of sustainable development with an artistic flair. Students fashion clay into bowls, glaze and fire them, and on a given evening, invite the community to enjoy soup made by the students and served in the bowls they have made. The bowls are "sold" to raise funds for Winnipeg Harvest.

This idea was brought into being in the division by Art Consultant Cameron Cross, who is also the inspiration behind Brush Out Poverty. Cameron's idea was to bring art and social justice together and in 2007, he travelled to Uganda and Kenya to visit orphanage schools where all the children had lost their parents through HIV/AIDS. Taking art supplies with him, he taught children to paint who had never painted before.

Cameron brought the African children's artwork back to Canada to give to the Pembina Trails students. Apart from exchanging art between students of two very different cultures, the digital images of the African children's art were made into cards that were sold to raise funds for the orphanages.

Earlier this year, the principal of The Great Valley School in Kampala, Uganda, visited 22 of our schools and shared the daily experience of his students and his constant fight to keep the school sufficiently funded to allow it to remain open. His engaging and realistic presentations allowed students to more deeply think about the worldwide issues of poverty, food, water, resources, equity and fairness. Brush Out Poverty has now been recognized as a UNESCO project.

#### Children's Mobility, Health and Happiness

Children's Mobility, Health and Happiness: A Canadian School Travel Planning Model is a two-year project funded through the Canadian partnership Against Cancer's CLASP initiative and the Public Health Agency of Canada. This is Pembina Trails' first year in the project and three schools are actively engaged in developing a process to address barriers to active transportation. Through community surveys, hands-up classroom surveys, neighbourhood walkabouts, planning

meetings and action plan development, each school is working to enable children to walk, cycle and more actively get to and from school each day. This involves looking at engineering improvements at or near the school sites such as pedestrian crossings, signage and repairs/upgrades to sidewalks, school infrastructure changes, traffic safety education, and community mobilization. One such example of community mobilization is at Dalhousie school where students walk with adult supervision in two walking school buses. Ryerson and St.

Avila schools join Dalhousie school in this project and the importance of making sure children can safely walk to school has taken on a wider community significance with work now started on the new stadium at the University of Manitoba.

As we continue to think about what it means to educate young people today and wrestle with the skills and knowledge that they need, living sustainably must be high on the agenda. Students must have the knowledge and skills they need but

more importantly, our young people want to make a difference in the world in a practical, hands-on way. They want to travel, make things happen, share with the world using technology and raise funds for causes they are passionate about. As educators, our goal is to help ignite that passion for our youth to help make our world a better place.

Graham Bruce is the Assistant Superintendent of Program in Pembina Trails School Division, Winnipeg.

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## Transformative Education as Sustainability

"The social sciences have a considerable history of attempts to apply models and theories from the physical sciences (to education). All such attempts have failed, primarily because no one found it insightful enough to distinguish between the mere application of an external theory to a field for which it was not intended, and the value of being content with a powerful metaphor instead."

e are living today in an educational environment that is preoccupied with outcomes. We want these outcomes to be measurable and obey simple cause-and-effect relationships. Moreover, educational policymakers place significant emphasis on a group of metrics (e.g., multiple regression analyses of students' knowledge, attitudes, behaviours, and achievement) that may not be contributing to the desired educational outcomes that we aspire to or place our own emphases on in schools. If, as Postman (1992) suggested, education is a "grand and instructive narrative [where] we rediscover the truths of social life and put forward metaphors, images and ideas that can truly help people live with some

#### What the Complexity Science research says to educators:

- The diversity of knowledge and experience is an important source of intelligence in systems that themselves learn.
- Rich learning engagements and multiple connections among learners occur when knowledge is seen as shared and distributed—not as capital to be negotiated.
- Local interactions within small groupings (and the power that emerges from self-organization) creates enhanced and shared classroom coherence and understanding.
- Complexity science principles allow teachers and school leadership to imagine ways in which their classrooms can become healthier and more democratic learning organizations.

(D. Stanley, 2009)

measure of understanding and dignity," then we just might be measuring the wrong things or have not yet discovered how to measure the things that matter in education more appropriately.

In Canada, measures of achievement and indicators of education for sustainable development (ESD) are becoming of interest to individuals, organizations and educational stakeholders who hold a collective interest in ESD as a priority (Michalos et al., 2011). If the conditions that contribute to the things we want to measure in terms of ESD outcomes cannot be easily controlled (and we might not want to argue in favour of a controlled environment in this instance), then there may be wisdom in considering caution about what the guiding assumptions are with respect to ESD in schools, and develop novel measurement instruments accordingly.

What might those guiding assumptions in ESD actually be? A few years ago, Vare and Scott (2007) identified two distinct environments for ESD - they called them simply ESD 1 and ESD 2. ESD 1 is what most organizations that are presently committed to the project deem important in the shorter term in which they operate (e.g., identifying what is clearly and rather visibly beneficial to communities, families, and individuals embedded in environmental systems or social structures). In short, pursuing the obvious but under some sort of external direction and definitions of what constitutes being sustainable. ESD 2 is different, more ambitious and also problematic. It includes, for instance, an extension beyond a response to expert opinion to actually develop and test socially constructed models of sustainability, explore the apparent contradictions in sustainable living, and view sustainable development

#### (MacPherson, 1999, p. 65)

as a continuously responsive learning process—not merely some external model to implement. It is important to emphasize that ESD 1/ESD 2 are complementary, not adversarial or a set of scaffolds.

To their efforts I would add here that instead of the typical focus on elements in teaching and learning that isolate the individual with the hope that some form of collective actions will ensue (ESD 1), we begin in earnest the process of encouraging educators to reorient their attention to the establishment of collectives (towards ESD 2).

There is a great deal of discussion these days among curriculum theorists, teacher educators in faculties of education, and school leaders about *transformative* learning experiences. In contrast to education as transmissive, transformation implicates the learner in a social context where values, past experiences, engagement with the

#### What ESD 1 and ESD 2 look like: Four responsibilities for educators.

- 1. Assist learners in understanding why the idea of sustainable development ought to be of importance to them (ESD 1).
- 2. Facilitate learning that fosters plural perspectives on issues from a range of cultural positions (ESD 1).
- 3. Provide opportunities for an active consideration of issues through an array of appropriate pedagogies that might begin with learners' and teachers' differing interests, understanding the significance of those differences (ESD 2).
- 4. Encourage thinking about what to do, both individually and socially, by keeping their own and other people's options open (ESD 2).

(W. Scott, 2002)

structures of curriculum, and divergent cultural perspectives create a much larger space for autonomy and self-determination. Recently, Jickling (2008) described this as an important function of education where students "are enabled to become critically aware of how they perceive the world with a view to fostering citizen engagement with issues and participation in decision-making processes" (p. 7).

There is a new science that could well provide powerful insights into re-imagining what the ESD project may cause to emerge in schools, and that science comes to us as *complexity*.

### What is complexity science—and its implications for education AS sustainability?

Complexity science developed primarily out of the fields of physics, ecosystems biology, chemistry and economics. It is not a theory of education and cannot be implicated as one. This field potentially has great promise if its principles are carefully applied to educational systems so that we can describe learning environments in entirely new ways. Paradoxically, it developed out of the natural sciences in the middle of the 20th century with all the reductionist inclinations to isolate fundamental units of structure and function, and embraced systems that are complex and have very large numbers of individual elements that are connected and interact with one another in a variety of ways (see Warren Weaver's seminal article from 1948). It is "concerned with wholes,

It would be more ethical, and more useful, were we to acknowledge that the purpose of education in relation to sustainable development was to explore the concept and its implications, tolerating different views in this process. William Scott (2002, p. 3)

with larger systems or environments and the relationships among their constituents" (Mason, 2008).

We can appreciate the nature and characteristics of complexity thinking by referring to some popular examples of "complex behaviour" that have led to the emergence of new organizational structures. These could include the collapse of the Soviet Union, the evolution of life on Earth, social insects such as bees and termites, a cohort of superintendents involved in a professional learning project and, with some emphasis here, education for sustainable development. Each of these systems involves a vast number of interacting agents whose actions, behaviours, and contributions allow for the system to change its own structure, adapt to new conditions, and perhaps develop new and desirable qualities. This is the first characteristic of a complex system it evolves and adapts to new conditions, sometimes in unexpected ways.

A second characteristic is no less important. Systems that behave in a complex way develop new qualities that did not exist before under previous conditions. We call this property *emergence*, and it can be thought of as a new, unforeseen whole coming about by virtue of the collective

interactions of the agents that have come together. Complexity scientists view these sorts of self-organizing phenomena as *systems that learn*. The learning is understood as an ongoing process of continual adaptation to new circumstances, and new circumstances come about through the conditions created by the participants in the learning system.

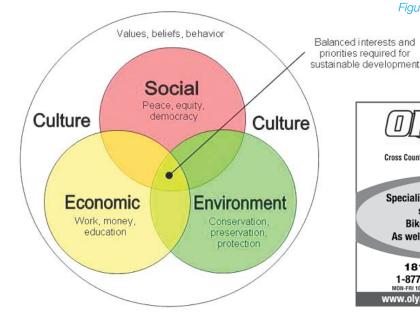
Returning to our example of ESD as a priority in education in Canada; imagine for a moment the initial identification of a new learning gap in the system. The decisions about who would assume leadership, where the expertise on ESD would be found, who among the stakeholders would participate in new ESD programming, and what individuals would comprise the myriad smaller group interactions demonstrates the hallmarks of networked, complex behaviour.

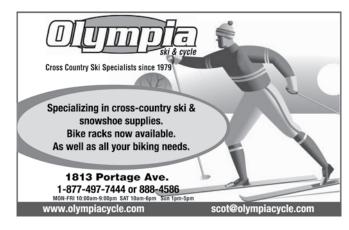
All of these are contingent, non-linear relationships. Additionally, the pluralism that would be expected in any environment that intends to nourish ESD makes room for respectful dissent, resists tendencies to a new hegemony, and encourages curriculum structures that are intended to transform rather than indoctrinate. One immediate implication is that ESD will have to pay particular attention to cultural aspects of human behaviour.

#### Figure 1

#### Classrooms: the importance of "bounded and nested spaces"

Some very deliberate and intentional things go on in a classroom that has





sensitivity to allowing the conditions for new emergent properties to take shape in the learning environment. Let's imagine how the notion of ESD is fluid at the classroom level—a place that can be less than tidy, predictable, or linear. The traditional Venn diagram model of sustainability interactions could be extended to embrace the "bounded spaces" of social, economic, and environmental considerations into the untidy aspects of culture (see Figure 1). That culture could be at the level of the classroom, school, community, language, or larger society.

Embedding these three spheres in the context of culture is a tacit acceptance that values, attitudes, choices and behaviours underpin any vision of the emergence of a sustainable future. One problem with this model is that it usually proposes a harmonious, holistic state of being where all three sectors interact co-operatively, with equity, and in balance. It would be naive to imagine such an abstraction occurring amid the vagaries of human aspirations. The model could alternatively suggest-particularly if we embrace ESD 2—an invigorating competition among these three sectors, with many complex interactions at work on various scales from the individual to the global. In such a view of ESD, it is the tensions that occur

within the system that will permit sustainable practices to emerge—quite on their own. Complexity science refers to such emergent qualities as *self-organization*.

What might happen if we were to immerse the learner's knowledge creation, attitudes and behaviours that are encouraged in education for sustainability into the currents of time and space that are ultimately affected by that education? The learning environment model might now look like Figure 2, a series of nested spheres of influence. Complexity thinking submits that all influences are active, dynamic systems that are learning, adapting, and in possession of new, emergent qualities that cause the systems to interact differently than previously imagined.

With this model, we can now begin a conversation about what could be called the "infinity of possibilities with the bounded spaces of curriculum and instruction." Darren Stanley from the University of Windsor likes to describe this as "teachers outlining the playing area, allowing for connections and insights to arise through shared classroom activities. When the classroom is thought about from the standpoint of complexity, and organized in this way, we anticipate unintended interactions among students and ideas that propels learning forward—this is

From the systems perspective, we need to develop understandings of sustainability interactions at a variety of scales in both space and time. For instance, even though we can appreciate our human impacts on the scale of decades (a human life span), there are active cycles occurring at scales beyond our ability to model effectively, or to influence by our decision-making. Note how the learner in ESD is immersed in these interactive systems, is a highly subjective agent, and has opportunities to leam formally over very short time scales. (Adapted from Davis & Sumara, 2006)

what complexity science refers to as the principle of *neighbour interactions*" (Stanley, 2009, p. 2). The valuable (and valued) contribution that ESD makes to curriculum is in setting up the boundaries of compelling new interactions that are naturally occurring in the nested systems, and students are immersed in actively learning and constructing their futures—both as individuals and contributing to the collective of the classroom and society.

In recent years, Charles Hopkins—UNESCO Chair for Education for Sustainable Development at York University—has been critical of what he terms "adjectival education" (e.g., learning through sustainable development education). William Scott (2002) has extended that critique by suggesting that education *for* sustainable development constitutes a prepositional form of education that runs the risk of implementing an educational agenda if the "for" lies outside of students having opportunities to explore all the implications of the concept and develop the ability to think based on their own experiences.

Perhaps it is time now to extend the metaphor one step further, and encourage complexity thinking around the idea of a deeper sustainability AS education. In such a view, the system of formal education would be so singularly committed to the future of our planet and our privileged place in it that sustainability would simply self-organize as an outcome. Eric MacPherson would likely say...it simply is.

John Murray is a PhD Candidate in the Faculty of Education and the Centre for Earth Observation Science (CEOS) at the University of Manitoba.

To follow the continuing online conversation, or get to know major figures in Canada whose work relates to complexity and its implications for education, go to:

www.complexityandeducation.ualberta.ca

For a complete list of references please contact editor Lara Schroeder at lschroeder@matrixgroupinc.net or (204) 953-3123.

# Successes, Drivers and Barriers to Education for Sustainable Development

Rockwood Elementary School students participate in a sing-along at Camp Assiniboia.



Rockwood Elementary School Grade 1 and Grade 2 students harvest their organic garden.



Rockwood Elementary School students built forts at Camp Assiniboia.

#### **By Curt Belton**

n the face of a myriad environmental, social, and economic concerns all over our planet, Education for Sustainable Development (ESD) is coming to the forefront as an integral and necessary part of public education. In this article, I intend to explain why I believe that ESD is a critical area of education, and what has led me to research success, drivers and barriers to ESD. In my initial research, barriers would be illustrated by factors such as the "crowded curriculum" and a lack of resources to support ESD at the school level, while drivers would be illustrated by the work of teachers who have developed exemplary practice in the classroom and by school divisions making ESD a priority. In Manitoba, there are many examples of successes, from Sisler High School's solar wall to Evergreen School Division having all schools attain EcoSchool status.

As a matter of clarification, I am looking at ESD as encompassing the three pillars of the environmental, social, and economic realms. According to UNESCO's Charles Hopkins, ESD initiatives should include at least two of the three pillars. In terms of understanding sustainability, one of the most eloquent definitions that I have heard is "having enough for all, forever."

My personal understanding of the need to take action on environmental issues and social concerns has grown to the point where I believe that learning to live in a sustainable manner is the most important issue of our time. My concern about sustainability started out of a lifelong love of nature fuelled by reading influential authors such as Rachel Carson and David Suzuki. Later, my experiences working in the inner city brought me into contact with the challenges facing our Aboriginal population, along with poverty and social justice concerns. Eventually I saw how these issues, together with environmental stewardship, fit into the

larger picture of sustainability. To me it seemed only natural to channel my energies into ESD.

For decades we have been hearing about the climate change and social inequity. Last September in Winnipeg, David Suzuki reminded us of the urgent need to evaluate what we are doing to the planet and to take corrective actions. Suzuki said that humans have become a "force of nature" driven by our voracious appetite for consumption. He stated that we must have the humility to recognize that there are planetary limits, and that many of us in the western world have been living like kings and queens. None of these sentiments are new, but for me it served as a reminder of the urgency to take action.

On the provincial front, at the Social Justice: Educating for ACTion conference in November, Education Minister Nancy Allen stated that social justice is critical to a democratic society and that in our busy lives we have little time for deep reflection. Stephen Lewis commented that we must develop global citizens who will take the world seriously. He also stated his belief that climate change is a critical issue, and that the concept of carbon damage is something that must be dealt with in the classroom. Also at the conference, Wade Davis of the National Geographic Society spoke about the extinction of language, culture, and the worldwide assault on the traditional ways of life of indigenous peoples. He warned that this diminishing of ethnocultural diversity is in its own right a threat to our survival.

Messages such as these have resonated with me for years and led me to become affiliated with the Environmental Conservation Lab (ECL) at the University of Manitoba. The focus of the ECL is to examine impacts of environmental degradation on communities, and their responses to these changes. My initial research project was in school ground greening and its effect on children's attitudes towards the environment. Then I had the opportunity to participate in UNESCO's World Conference on ESD in Bonn, Germany, in March 2009. This was a profound experience that

changed the direction of my research to look at the larger picture of Education for Sustainable Development.

#### Attending UNESCO's World Conference

I attended this extraordinary event with 1,000 delegates from over 150 different countries. This conference was the mid-point review of UNESCO's Decade of ESD (2005-2014). It was a humbling experience to hear about the real issues facing nations worldwide, and no one could have left the conference without feeling the need to take action. In one workshop entitled Advancing Sustainable Lifestyles and Consumption through ESD, we heard the suggestion that for some countries, sustainable development might mean that they get to consume a little more, not less, in order to meet their basic needs of nutrition, health care, and education. The suggestion was implicit that perhaps some of the Western nations would need to give up a little of their excess to facilitate that.

Sitting around a table with delegates from Asia, Africa, the U.K. and Australia, we had an intense discussion about what was happening in ESD in our respective countries. The African delegate talked about the difficulty of just getting qualified teachers in his country. Our English delegate talked about the marvelous framework they had for sustainable schools in England, but how she wished that the agenda was moving ahead faster in terms of school participation. Our Australian delegate offered us hope in both the structures for ESD that had been put in place in his country, but also the level of participation among the schools. I was able to add that while we have champions of ESD in Manitoba, such as Deputy Minister of Education Gerald Farthing, Canada's official representative on the floor at Bonn, there was not a completed national strategy. A national strategy is now close to completion through the work of the Council of Ministers of Education of Canada.

After three intense and very long days, the conference wrapped up and representatives from 30 countries led by Canadian Charles Hopkins had come up with the Bonn Declaration, entitled

"A Call to Action." For countries that can't feed their population, are mired in civil unrest and political strife, are feeling the devastating effects of climate change, and where most citizens live in poverty without access to proper medical care, there is indeed a need for action. It is sometimes hard for us to realize this as we live comfortable lives in a peaceful part of the world that has not yet felt the full effects of climate change. For me, this "Call to Action" meant that I would need to change the focus of my research to encompass the broader spectrum of ESD.

England and Australia both have a Sustainable Schools model where schools look at a number of different areas, including the operation of the school and its impact on the environment. It is interesting to note that according to one of my English contacts, they chose to use the term Sustainable Schools because they thought that this term was easier to understand than ESD. An Australian contact explained that to him ESD is the theory, and the Sustainable Schools model is the practical application. Manitoba will be releasing our own Sustainable Schools document soon with tools to help schools and divisions develop sustainability plans.

England has the Eight Doorways that schools can use to initiate or extend their sustainable schools activity, which include: food and drink, energy and water, travel and traffic, purchasing and waste, building and grounds, inclusion and participation, local well-being and global citizenship. England also has a supporting website found at www.teachernet.gov.uk/sustainableschools/framework/framework\_detail.cfm.

#### Gaining valuable insight

As I write this article, I am currently in the process of interviewing 12 participants each from Canada, England, and Australia, to gain their insights about local issues affecting ESD. The participants will be from different areas of each country and parts of the system. I will be interviewing teachers, principals, senior administration, co-ordinators and NGO workers. The interview questions cover topics such as: successes they have seen, whether they feel ESD is reaching the necessary goals in

their area, their perceptions about the urgency for this work and their understanding of sustainability. The analysis and synthesis of this data should reveal effective practices for ESD that can be shared as well as challenges that need to be overcome.

In some of my initial conversations with participants from England, it appears there is an acceleration of interest and growth of leadership in the Sustainable Schools movement. One suggestion was that school principals should be required to receive training in ESD. Other ideas included making sure young people were empowered through our efforts and given hope, as opposed to being fed a diet of gloom and doom. Also suggested was that schools need to take ESD seriously, and that ministers of education need to state that ESD is something of importance. This made me think of how fortunate we are to have ESD as a priority in our province.

Other ideas included highlighting examples of exemplary practice in ESD as a guide for those schools that are just beginning their journey. The sense of urgency to get on with the implementation of ESD was very clear, with global injustice and climate change being the prime concerns. Finally, there's a feeling that more research and evaluation needs to be done in order to establish effective practice in ESD and bring it to a wider audience.

The body on research continues to grow in ESD due to the efforts of organizations such as the International Institute for Sustainable Development and, of course, UNESCO. Various research projects related to ESD have also been happening at our

universities, including a recently published study by Gary Babiuk and Thomas Falkenberg of the University of Manitoba entitled "Sustainable Development and Living through Changing Teacher Education and Teaching in Manitoba." This study focuses on preparedness and support for teachers of ESD in Manitoba and how these levels could be improved.

Personally, I find I hope in the fact that there are other researchers working in this field trying to find out what we can do to promote and sustain ESD. Some of the general concepts that I have come across in researching, interviewing and having more informal discussions include the need to:

- Support teachers in their understanding of ESD and also highlight effective practices for them to try out.
- Dedicate staff time and resources to support the meaningful implementation of ESD.
- Support, validate, and promote ESD initiatives that are already in place.

If you look around the schools in your area, you are sure to see that there is already a lot going on in ESD, from environmental stewardship as schools engage in school ground greening, to social justice initiatives where students participate in relief efforts for countries like Haiti, where environmental disasters have occurred. Hopefully we can keep up the momentum and engage even more learners of all ages in discovering what it means to live in a just and sustainable society.

Curtis Belton is Principal of Rockwood Elementary School in Winnipeg, Manitoba.



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#### Education for Sustainable Development: Rising to the Challenge

was fortunate to be asked to represent Canada on the Expert Group on Competences (EGC), which the United Nations Economic Commission for Europe (UNECE) established in 2009. The mandate given to the EGC was to define educator competences in education for sustainable development (ESD) and to formulate recommendations for policymakers across the 56 different member countries in the UNECE, one of five regional commissions of the United Nations. Our group is comprised of representatives from Russia, Kazakhstan, Georgia, Hungary, Lithuania, Greece, the Netherlands, Germany, Belgium, Sweden, Ireland, the U.K., the U.S. and Canada.

The Bonn Declaration, which was issued at the conclusion of the 2009 UNESCO World Conference on ESD, captures the urgency underlying the work of the EGC: "A decade into the 21st century, the world faces substantial, complex and interlinked development and lifestyle challenges and problems. The challenges arise from values that have created unsustainable societies.... Through education and lifelong learning we can achieve lifestyles based on economic and social justice, food security, ecological integrity, sustainable livelihoods, respect for all life forms and strong values that foster social cohesion, democracy and collective action."

Education has been accused of perpetuating a "culture of denial" and contributing to the existence of unsustainable lifestyles. All stakeholders in education, regardless of role, should not plead innocence, as those with the most education also have the largest ecological footprint. The model of development observed across the planet is no longer sustainable and a reorientation of education towards sustainable development may provide the required impetus for getting back on track.

Sustainable development has been defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." New models of sustainable development, both local and global, will have to be founded on values such as solidarity, equality, mutual respect, justice and harmony with nature if we are to create "a better future for all, now and in the future." The development of sustainable societies is a formidable challenge involving many complex issues and will require citizens who are aware of our global predicament, who can think both critically and creatively, who can adapt to rapid and continuous change, and who understand that there are multiple competing pathways to development and that these reflect current knowledge, beliefs and attitudes. The path to sustainability is therefore dynamic and iterative, "a direction rather than a fixed goal."

#### **Equipping our educators**

The UNECE strategy is to equip people with the required competences for creating a sustainable world. The recommendations for policymakers are organized according to four overriding themes: (1) professional development; (2) governance; (3) curriculum development; and (4) assessment. The recommendations are addressed to various stakeholders from those at the organizational level (schools, ministries, and universities in the formal education sector) to the national level (Council of Ministers of Education, Canada [CMEC]; Learning for a Sustainable Future [LSF]), the regional level (European Commission), and the international level

(UNESCO). The recommendations are meant to be adapted in each jurisdiction; ownership will be key to successful implementation in all 56 member countries.

The eight recommendations on professional development range from one on the importance of empowering teachers through professional development initiatives, to reviewing initial teacher education programs with regard to ESD, to the role of partnerships and networks in supporting the implementation of ESD in the formal and non-formal educational systems. The six recommendations on governance include developing synergies among stakeholders at different levels (local, national, regional and international) and across disciplines and sectors to facilitate implementation despite boundaries, developing effective models of leadership, and adopting a whole-institution approach throughout the implementation phase. Curriculum development includes only two recommendations, which focus on reviewing curricular documents, as well as textbooks and other support materials. The two recommendations on assessment include monitoring the implementation of ESD in the various systems and ensuring quality through inspections, review, and external evaluations.

#### **Competences for educators**

The core competences in ESD for educators are subsumed under three essential characteristics of ESD: (1) a holistic approach; (2) envisioning change; and (3) achieving transformation. Moreover, the competences are also categorized under four rubrics adapted from a UNESCO report: (1) learning to know; (2) learning to do; (3) learning to live together; and (4) learning to be. These learning experiences collectively include those understandings and skills, both practical and interpersonal, and personal dispositions that educators should possess if they are to be effective in ESD.

A holistic approach includes integrative thinking, the willingness to think both globally and locally and the ability to consider the economic, the social and the natural when confronted by an issue or dilemma. Educators should also promote active citizenship among learners through projects in the community. Envisioning change includes considering past experiences and exploring positive alternative futures while engaging with local and global issues in the present. Achieving transformation focuses on three interrelated elements. First, educators must be critically reflective practitioners who embrace the proposed changes if the system is to be reoriented towards ESD. Second, the pedagogy in place will have to be transformative rather than transmissive. Although ministries, school divisions and universities espouse pedagogical approaches in which learners actively construct their knowledge, studies have consistently shown that there is a serious disconnect between the stated or intended curriculum and the enacted curriculum. Moreover, the pedagogical base for ESD is relatively undeveloped and is still not common knowledge among educators. Third, the system itself will need to be changed by transforming the environment, both physical and human, so that it also embraces the principles of sustainability.

#### Other ongoing sustainability activities

Although I have only summarized the report of the UNECE/EGC, many other ancillary activities are ongoing in support of ESD:

- A faculty seminar was organized in Manitoba in November 2009 to discuss ESD as a priority in Manitoba and its impact on teacher education. Collège universitaire de Saint-Boniface (CUSB), Learning for a Sustainable Future (LSF), Manitoba Education, and the Manitoba Education Research Network (MERN) partnered in sponsoring this event.
- A round table on preparing teachers for ESD was held in Montreal last June at the annual meeting of the Canadian Society for the Study of Education (CSSE). This discussion was sponsored by the Association of Canadian Deans of Education (ACDE) and involved researchers from across Canada.
- Over the past decade, Manitoba Education has demonstrated leadership by embracing ESD in all of its activities. This year, the department established a Faculty of Education Steering Committee for identifying opportunities and developing recommendations to strengthen ESD.
- A study is underway to determine how faculties of education prepare teacher candidates for meeting the challenges of sustainability once in the classroom. The partners involved in this initiative include researchers from different universities, the Council of Ministers of Education (Canada), the Institute for Sustainable Development (IISD), LSF, and Manitoba Education.
- In March 2011, I gave an update of the UNECE/EGC work at the annual meeting of the Western Association of Deans of Education (WADE). My hope is to create interest for

establishing a regional network of educators and researchers for moving forward with this work on ESD.

The EGC has asked the UNECE to extend our mandate until December 2011 to allow us to develop tools to facilitate the implementation of the policy recommendations. Manitoba has much to contribute and I welcome suggestions from fellow educators.

Jonathon Porritt has suggested that the end-game is "the reinvention of modern society [and requires] building a bridge from a sense of Nature into the late modern world." In a memorial lecture on science and the environment, James Speth, founder of the World Resources Institute, corroborated this idea, suggesting that we must build a "sustaining economy—one that gives top overriding priority to sustaining both human and natural communities." The educational community in Manitoba has many strengths that it can call on for transforming education to address sustainability but it will require a concerted and strategic effort among stakeholders. I look forward to working with all of the educational actors in Manitoba to bring about these changes to rise to the challenge and adapt to our changing world.

Dr. Léonard Rivard is Director of the Community-University Research Alliance on Francophone Identities in Western Canada (CURA), Collège universitaire de Saint-Boniface.

For a complete list of references for this article please contact this magazine's editor, Lara Schroeder, at lschroeder@matrixgroupinc.net or at (204) 953-3123.



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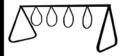
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#### The Manitoba Sustainability Education Directory:

#### **Learn! Do! Share Online!**

#### By Lindsay Irwin and Christina McDonald

ave you ever wondered how best to communicate your school's exciting sustainability initiatives to a wider audience of interested Manitobans? In turn, have you wished that you knew more about what others were doing in the field of sustainability education—at the school level, across your division, among your students' connections to their friends and families? If this sounds like you, then read on about the new Manitoba Education for Sustainability Directory!

Green Manitoba, a special operating agency of the provincial government, has recently created an easy-to-use and lowcost online directory entitled the Manitoba Sustainability Education Directory (MSEd). It is now available at www.msed. ca. The creation of an online knowledge portal of sustainability information demonstrates government's recognition of our shared and important roles in promoting education for sustainable development (ESD) and facilitating the sharing of good sustainability practices, experiences, innovations and information.

#### What does the MSEd Directory hold for me?

Informed citizens and people who are knowledgeable about appropriate levels of consumption of goods and services are essential in enacting new measures of sustainability. We know now that simply having that knowledge is not enough to evoke action—it is through our choices and actions that the prospect of a more sustainable future comes into focus as a real possibility. One of the key benefits of the MSEd Directory is helping sustainability educators understand what each is doing and facilitating partnership development. In addition, the directory establishes important baseline information on the current status of sustainability initiatives across sectors to assist in the identification of gaps and priority areas for further action.

The ultimate goal is to develop a more co-ordinated and integrated approach to better serve the needed changes in the living habits of all Manitobans.

The advantages of creating a profile and using MSEd.ca include:

- · Share effective practices according to sustainability theme or sector.
- · Communicate school division Sustainability Action Plans and highlight accomplishments.
- Aid the answering of public enquiries.
- Publicize events.
- Identify funding and volunteering opportunities.
- Highlight connections among sustainability programs, teacher curriculum requirements and the creation of new learning experiences for students or by students.
- Recognize sustainability leaders and experts in the field and develop networking and partnership connections.
- Help organizations learn from known effective practices in Manitoba.

The interests and activities of school divisions are a particular focus of the MSEd Directory. All school divisions are listed in a drop-down menu. Curriculum connections are integrated into program profiles in

order for educators to know how a particular program is aligned to curricular outcomes. Furthermore, the "Search for Resources" webpage is organized and searchable by school division name. Senior level officials of school divisions can search for activities implemented within and among school divisions and post their sustainability education action plans, priorities and effective practices.

Principals can highlight what initiatives are taking place in their schools and can search periodically throughout the data base to make linkages to community initiatives. Educators—in addition to posting exciting projects and events-can search the directory to find relevant instructional resources, programs that will assist them in teaching sustainability issues and what is being done to address those issues in their own backyard and across the province. Educators will find sustainability demonstration projects that provide field trip opportunities for students and locate organizations interested in partnering with their schools to carry out sustainability initiatives. Students can post their own projects and initiatives for





Technical Vocational Initiative's Community Partnership Project with Killarney School

"A research project on eutrophication in Killarney Lake. The desired outcome of this research is algae remediation / mitigation. This is a student-led research based project which works in conjunction with the community, the k-12 school system, and Technical Vocational Initiative.



Green Action Centre's Active & Safe Routes to School Program

"The Active and Safe Routes to School Program is flexible and can be tailored to meet the specific needs of your school and community. Program components include neighbourhood walkabouts, transportation surveys, walking clubs, walking/cycling school buses for children with adult supervision, no-idling zones, and active transportation events including Clean Air Day, the Commuter Challenge and International Walk to School Day."



parents and other community members to see. They can also search the directory and draw on the new and interesting initiatives that are going on in their own province to address sustainability issues. The "Calendar of Events" will make it easy for all to post and find out when sustainability events, such as the Manitoba Envirothon, ForestEd, the Youth Encouraging Sustainability (Y.E.S.) Showcase or the upcoming International Student Science Fair (ISSF 2012), are taking place. The MSEd Directory offers secure usernames and passwords that are unique to each school division, and requires only a nominal cost-recovery fee of \$50 per year for each school division or organization.

ARCHITECTURE AND ENGINEERING

STANTEC ...

#### What are some of the key features of the directory?

Key features of the MSEd Directory include: access to local sustainability education providers across all sectors; information on sustainability action projects/ demonstrations occurring on the ground across the province; events and funding calendar; quick and easy listings, including uploading of videos, logos and photos and opportunities to link to existing websites and flexible and varied search options including the ability to search by:

- Region of the province.
- Sustainability theme (aligned with 2009 Manitoba Sustainability Report).
- Sector.
- · Organization.

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Subject.

So why not create a profile today that showcases your school division's sustainability initiatives? The MSEd community is growing every day through the efforts of forward-thinking and creative sustainability education organizations across Manitoba. Educational leaders can visit www.msed.ca and LEARN! DO! SHARE ONLINE!

Lindsay Irwin is an Environmental Program Analyst with Green Manitoba and Dr. Christina McDonald is the Chief Operating Officer. Additional information is available at: greenmanitoba.ca.

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