Education for Sustainable Management

Davorin Kralj[12]

ART-K, BusinessConsulting, Na gricu 47, 2000 Maribor, Institut for Business Excellence, Novi trg 5, 7000 Novo mesto[12] SLOVENIA
davorin.kralj@amis.net

Abstract: The global economic system needs to show a more human and environment friendly face. Companies must ensure that their traditional focus on corporate profits and shareholder value is accompanied by equal concern for the needs of society and the environment. One of the key reasons for the problems of today is the absence of an integral approach in planning or drafting development strategies. It is a feature of natural eco-systems that each thing or living creature can do several things at the same time and that each important task is supported by several different elements. Human society may also be viewed as an integral system made up of individuals and groups, but subjected as a whole to the laws of nature.The article focuses on system approach and education as an influence on environmental care and sustainable management. Integrated system approach and education management integrate the requirements of sustainable development and environmental care. Environmental care and sustainable development are result of education and dialectical system approach.

Keywords - environmental care, environmental education, system approach, sustainable development

1 Introduction

Over the last two decades or so, we've seen how more and more writers link our current environmental problems to modern living. Take for instance *Rachel Carsens' 'Silent Spring'* or *Ulrich Beck's 'Risk Society'*, both of which continue to be widely cited and quoted at environmental gatherings. Such works argue that the environmental crises we hear about is a product of industrialization and inappropriate development. Education then, according to such an argument, must respond by addressing the destructive nature of modernity.

Today, most social problems experienced by humans somehow have their root in the distribution and use of natural resources. We know that human survival depends on the continued existence of natural resources and that the quality of life humans is intricately linked to the quality (and perhaps also, the quantity) of environmental resources such as water, air, soil and so forth. Science has shown that despite the efforts of thousands of environmental organizations, our environmental problems continue to worsen. Resources are being depleted and habitats are still being destroyed to make way for human progress.

Other life forms that depend on these resources and surroundings also become threatened. This chain effect of resource depletion or environmental degradation ultimately effects all of us.

A famous eastern saying runs as follows: 'all things are connected and are none of themselves'. Whatever affects anything in the biophysical world will ultimately affect us as humans. It is every person's duty and responsibility to find ways through which to develop an understanding of how humans are linked to the natural order and how we can use our intellect to remedy the effects of destructive actions. This realization raises important questions for the educator, who must now take up the task of addressing environmental problems as that which is rooted in the social, economic and political life-world of a learner (see also Learner Resources for more on the environment as interacting life-words).

Since biblical times, people have gotten the most done when they worked cooperatively in teams, although they didn't actually use the term team. ("EE") [1].

Because of this is so important co dependence, relationships, connection, openness, dialectic system of view points and education for environmental excellence and sustainable development.

2 Definition and Principles of Environmental Education (EE)

Environmental education ("EE") refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems in order to live sustainably. The term is often used to imply education within the school system, from primary to post-secondary. However, it is sometimes used more broadly to include all efforts to educate the public and other audiences, including print materials, websites, media campaigns, etc [6].

The North American Association for Environmental Education, has established the following "Guidelines for Excellence" for environmental education:
1. Fairness and accuracy: EE materials should be fair and accurate in describing environmental problems, issues, and conditions, and in reflecting the diversity of perspectives on them. 1.1 Factual accuracy. 1.2 Balanced presentation of differing viewpoints and theories. 1.3 Openness to inquiry. 1.4 Reflection of diversity.
2. Depth: EE materials should foster an awareness of the natural and built environment, an understanding of environmental concepts, conditions, and issues, and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels. 2.1 Awareness. 2.2 Focus on concepts. 2.3 Concepts in context. 2.4 Attention to different scales.
3. Emphasis on skills building: EE materials should build lifelong skills that enable learners to address environmental issues. 3.1 Critical and creative thinking. 3.2 Applying skills to issues. 3.3 Action skills.
4. Action orientation: EE materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental issues as a basis for environmental problem solving and action. 4.1 Sense of personal stake and responsibility. 4.2 Self-efficacy.
5. Instructional soundness: EE materials should rely on instructional techniques that create an effective learning environment. 5.1 Learner-centered instruction. 5.2 Different ways of learning. 5.3 Connection to learners' everyday lives. 5.4 Expanded learning environment. 5.5 Interdisciplinary. 5.6 Goals and objectives. 5.7 Appropriateness for specific learning settings. 5.8 Assessment.
6. Usability: EE materials should be well designed and easy to use. 6.1 Clarity and logic. 6.2 Easy to use. 6.3 Long lived. 6.4 Adaptable. 6.5 Accompanied by instruction and support. 6.6 Make substantiated claims. 6.7 Fit with national, state, or local requirements. zz

According to the International Union for the Conservation of Nature (IUCN), environmental education (EE) is:

"... the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among men, his culture and his biophysical surroundings. EE also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality. International Union for the Conservation of Nature (IUCN; 1971)

The 1977 Tbilisi Conference, which followed soon after the launch of the United Nations Environmental Programme (UNEP), is known to have spearheaded clarification on the nature of environmental education. This conference resulted in a declaration which listed seven directive principles for environmental education (EE) programmes. These are summarized as follows:

- EE is a lifelong educational process that occurs at all levels of education.
- EE is about the interactions which occur in the natural, the built and social environment. It should lead to the understanding of how human interactions and political processes, together with the nature of socio-economic issues and the effect of these on environmental degradation or enhancement.
- EE is for developing attitudes and value systems which lead to socio-economic improvement through positive social interactions and the maintenance and improvement of the natural and built environment.
- EE aims to develop an individual's understanding, skills and the feelings of empowerment that are necessary for both positive behaviour towards the biophysical and social environment in everyday living, and for

active participation in group efforts to find the optimal solutions for environmental problems

- EE requires a holistic and preferably interdisciplinary approach to teaching with opportunities for diverse learning experiences, but with particular emphasis on direct experiential learning in natural, built and social environments. EE requires a holistic and preferably interdisciplinary approach to teaching with opportunities for diverse learning experiences, but with particular emphasis on direct experiential learning in natural, built and social environments [5].

Environmental education is therefore not only the concern of natural scientists, but draws from the tools and resources of a wide range of disciplines in order to demonstrate the root of current problems and suggest ways in which learners could either prevent or remedy these [5].

Recently, and because of agreement that our environmental crises are the result of problems with modernity, educators have begun to move away from teaching approaches that stress 'wildlife experience' or 'nature study' (i.e. teaching merely about the scientific aspects of nature). Educators now prefer an approach that encourages learners to understand and transform problem environments. It is in this sense that we now prefer to speak of EE as education about and for the environment. Ten years ago EE would have been equated with the environmental sciences, a field which is dominated by the conventions and traditions of the scientific method. It is now seen as a holistic field that draws from the tools of both the social and natural sciences [5].

It is agreed both locally and further abroad, that educators should adopt the approach that stresses holism when addressing environmental issues. This means that planet Earth should be seen as a super-organism consisting of interrelated and interdependent biophysical entities that are undergoing continuous transformation. Humans are located within a technologically-orientated sphere (techno-sphere), which in turn is located within a broader social and biophysical environment (see figure below). This approach requires educators to encourage learners to think in terms of systems theory, which sees the whole (the super-organism) as greater than the sum of its individual parts. Thus, positive actions in specific parts (or individual life-worlds e.g. the economy) should work to the benefit of the whole. This form of 'inclusive' thinking encourages learners to develop associations between various constituents (life-worlds) of a system and demands that learners develop proficiency in a range of subject areas or disciplines [5].

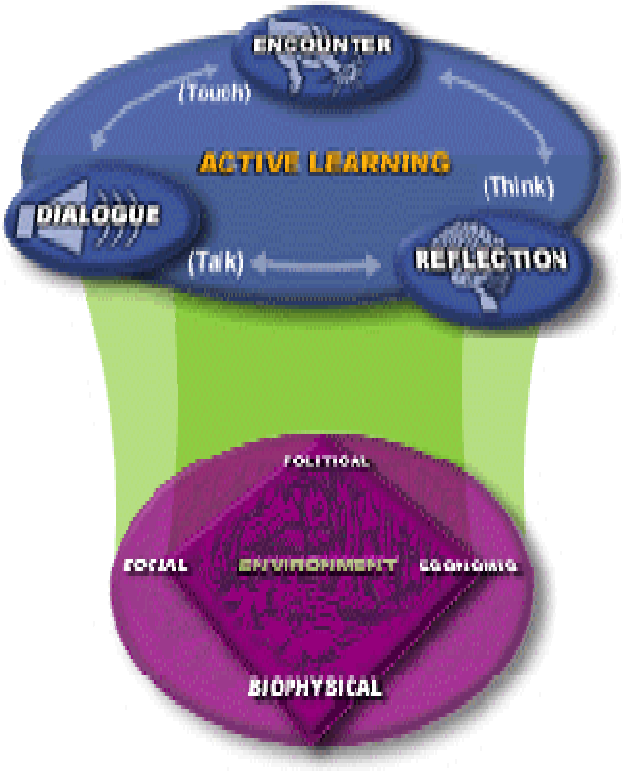

Fig 1: Active learning [5]

Most educators also agree that environmental education is not a separate discipline. It is a systematic process in which learners are empowered to critique a problem environment, through direct experience and the communication of information. Learners are also encouraged to engage in practical activities that ultimately benefit the biophysical environment. This process must result in three outcomes:

- understand their learners must relation to other interlinking chains of natural systems and socio-ecological processes.
- learners must interpret conditions into their own frameworks, since much of what we learn about 'reality' is determined and shaped by our individual worldviews and backgrounds.

- learners must be able to critique conditions and uncover hidden ideologies or assumptions underlying specific problems. That which is learned must drive the learner towards transformation. Knowledge of environmental issues must be built for the ultimate objective of action and practical change.

Programmes differ in the extent to which they are able to achieve all of these outcomes. Some succeed in creating the awareness and knowledge of environmental problems, while others culminate on renewed action that benefit the natural environment. Yet, with our environmental problems still worsening after 25 years of debate, it's not hard to understand why many educators are insisting that learners embark on practical, action-geared projects.

3 Environmental Management System

The Global Compact's environment principles are derived from the Rio Declaration on Environment and Development. The three principles are:

- Principle Seven: business should support a precautionary approach to environmental challenges;
- Principle Eight: undertake initiatives to promote greater environmental responsibility; and;
- Principle Nine: encourage the development and diffusion of environmentally friendly technologies.

The key element of a precautionary approach, from a business perspective, is the idea of prevention rather than cure. In other words, it is more cost-effective to take early action to ensure that irreversible environmental damage does not occur. Companies should consider the following:

- While it is true that preventing environmental damage entails both opportunity - and implementation - costs, remediation environmental harm after it has occurred can cost much more, e.g. for treatment costs, or in terms of company image.
- Investing in production methods that are not sustainable, i.e. that deplete resources and degrade the environment, has a lower, long-term return than investing in sustainable operations. In turn, improving environmental performance means less financial risk, an important consideration for insurers.
- Research and development related to more environmentally friendly products can have significant long-term benefits[15].

Issues for the company to deal with under this approach include providing better information to the consumer, communicating potential risk for the consumer, the public or the environment. It also includes obtaining prior approval before certain products, deemed to be potentially hazardous, may be placed on the market. Steps that the company could take in the application of this approach include the following:

- Develop a code of conduct or practice for its operations and products that confirms commitment to care for health and the environment.
- Develop a company guideline on the consistent application of the approach throughout the company.
- Create a managerial committee or steering group that oversees the company application of precaution, in particular risk management in sensitive issue areas.
- Establish two-way communication with stakeholders, in a pro-active, early stage and transparent manner, to ensure effective communication of information about uncertainties and potential risks and to deal with related enquiries and complaints. Use mechanisms such as multistakeholder meetings, workshop discussions, focus groups, public polls combined with use of website and printed media.
- Support scientific research, including independent and public research, on the issue involved, working with national and international institutions concerned.
- Join industry-wide collaborative efforts to share knowledge and deal with issues, in particular production processes and products around which high level of uncertainty, potential harm and sensitivity exist[15].

The world is today facing unique environmental challenges. Among these include; record loss of biodiversity and long-term damage to ecosystems; pollution of the atmosphere and the consequences of

climate change; waste production & disposal; natural resource depletion; impacts of chemicals use and toxic substance disposal; damaged aquatic ecosystems and; land degradation [15].

Environmental management has evolved over thepast four decades. At first, businesses responded tonew regulations as they were enacted. These regulations generally addressed pollution by eparateenvironmental media, such as water or air. This type of regulation, where government dictated the actions to be taken, was often perceived by business as being overly restrictive, inefficient, and costly. In response, many businesses began to seek more proactive ways of effectively managing their environmental impacts. One of the most widely used voluntary environmental initiatives is the ISO 14001environmental management standard. ISO 14001 is an international environmental management standard that offers a systematic approach to compliance and continual improvement while being flexible and widely applicable to a variety of organizations, such as manufacturers, service providers, and government agencies [20].
ISO 14001 was developed by the International Organization for Standardization to provide a template for environmental management systems. In order for facilities to obtain ISO certification they must:

- Develop a policy statement on the organization's commitment to the environment.
- Identify the environmental impacts of products, activities and services.
- Make a commitment to compliance with applicable laws and regulations.
- Set environmental goals for the organization, and developing the means to achieve them
- Establish roles and environmental responsibilities within the organization.
- Maintain documents about the EMS and related procedures.
- Monitor key activities and track EMS performance to correct problems and prevent reoccurrences.
- Audit the EMS to verify that it is effective and achieving objectives and targets to ensure that it is still suitable and appropriate.
- Make a commitment to continual improvement of the EMS.

Despite these requirements, ISO 14001 does not mandate a set level of environmental performance nor does the standard require the use of a particular technology [16].

4 Environmental Organizational Scanning

PESTLE analysis is a useful tool for understanding the industry situation as a whole, and is often used in conjunction with a SWOT analysis to assess the situation of an individual business. PESTLE stands for "Political, Economic, Sociological, Technological, Legal and Environmental" factors. The questions to ask yourself are :

- What are the key political factors likely to affect the industry?
- What are the important economic factors?
- What cultural aspects are most important?
- What technological innovations are likely to occur?
- What current and impending legislation may affect the industry?
- What are the environmental considerations [17]?

Originally designed as a business environmental scan, the PEST or PESTLE analysis is an analysis of the external macro environment in which a business operates. These are often factors which are beyond the control or influence of a business, however are important to be aware of when doing product development, business or strategy planning [18].

Factor	Often Comprised Of
Political	- Current taxation policy - Future taxation policy - The current and future political support - Grants, funding and initiatives - Trade bodies - Effect of wars or worsening relations with particular countries
Economic	- Overall economic situation - Strength of consumer spending - Current and future levels of government spending - Ease of access to loans - Current and future level of interest rates, inflation and unemployment - Specific taxation policies and trends - Exchange rates
Sociological	- Demographics - Lifestyle patterns and changes - Attitudes towards issues such as education, corporate responsibility and the environment - Social mobility

	- Media views and perceptions - Ethnic and religious differences
Technological	- Relevant current and future technology innovations - The level of research funding - The ways in which consumers make purchases - Intellectual property rights and copyright infringements - Global communication technological advances
Legal	- Legislation in areas such as employment, competition and health & safety - Future legislation changes - Changes in European law - Trading policies - Regulatory bodies
Environmental	- The level of pollution created by the product or service - Recycling considerations - Attitudes to the environment from the government, media and consumers - Current and future environmental legislative changes

Table 1: PESTLE analysis [17]

It is important to take into account PESTLE factors for the following main reasons:

- Firstly, by making effective use of PESTLE analysis, you ensure that what you are doing is aligned positively with the powerful forces of change that are affecting our working environment. By taking advantage of change, you are much more likely to be successful than if your activities oppose it
- Secondly, good use of PESTLE analysis helps you avoid taking action that is likely to lead to failure for reasons beyond your control
- Thirdly, PESTLE is useful when you start a new product or service. Use of PESTLE helps you break free of assumptions, and helps you quickly adapt to the realities of the new environment [18].

The PESTLE subject should be a clear definition of the market being addressed, which might be from any of the following standpoints:

- A company looking at its market
- A product looking at its market
- A brand in relation to its market
- A local business unit or function in a business
- A strategic option, such as entering a new market or launching a new product
- A potential acquisition
- A potential partnership [18].

4. System Approaches Change Education Management

Early in the final decade of the 20th century, the largest group of world leaders ever to assemble defined what may be education's greatest challenge and responsibility: to help citizens of the world prepare for a future of sustainable development (Sitarz, 1993). Sustainable development has been defined over the years in a variety of ways, but Jacobs (1993) has suggested that all definitions have a core meaning characterized by three elements: (a) consideration of environmental issues and objectives interdependently with economic issues and objectives; (b) a commitment to social equity and the fair distribution of environmental benefits and costs, both geographically and across human generations; and (c) an enlarged view of "development" that extends beyond simple measures of "growth" to include qualitative improvements in daily life [9].

Campaigns for social change are not a new phenomenon. They have been waged from time immemorial. In Ancient Greece and Rome, campaigns were launched to free slaves. In England during the Industrial Revolution, campaigns were mounted to abolish debtor prisons, grant voting rights to women, and abolish child labour. Notable social reform campaigns in nineteenth-century America included the abolition, temperance, prohibition and suffrage movements as well as a consumer movement to have governments regulate the quality of foods and drugs. In modern times, campaigns have been launched in areas as health promotion (anti-smoking, safety, drug abuse, drink/driving, AIDS, nutrition or physical fitness); environment (safer water, cleaner air, preservation of national parks and forests); education (literacy, school attendance, encouragement of students to take math and sciences) and in the economy (to boost job skills and training, attract foreign investors or revitalise older cities). Some of these campaigns have been successful, while others have failed. People involved in social change campaigns have gradually come to realize that an approach focused entirely on alerting the public to the dangers of certain health related behaviours or of

polluting the environment is often inadequate in fostering changes in attitudes, opinions and, above all, behaviours. [6]

The educational challenges for sustainable societies are great for several reasons: (a) the global sustainability challenge is unprecedented in both magnitude and complexity, (b) there is no history of societies willingly and deliberately taking steps to institutionalize restraints and change individual and collective behaviors to achieve greater sustainability, and (c) a constructive educational response must include a comprehensive, coordinated attempt to redefine the human role in nature and reexamine many assumptions, values, and actions we have long taken for granted) [9]. We must "prepare each student to lead a sustainable lifestyle" and "place ecosystems concepts at the intellectual center of all disciplines." [9].

In outlining an array of strategic actions and initiatives promoting education for sustainability, the report focuses on six themes:

1. Lifelong learning within both formal and nonformal educational settings.
2. Interdisciplinary approaches that provide themes to integrate content and issues across disciplines and curricula.
3. Systems thinking as a context for developing skills in problem solving, conflict resolution, consensus building, information management, interpersonal expression, and critical and creative thinking.
4. Partnerships between educational institutions and the broader community.
5. Multicultural perspectives of sustainability and approaches to problem solving.
6. Empowerment of individuals and groups for responsible action as citizens and communities[gg].

These themes reflect an acknowledgment that education about the environment and sustainability is interdisciplinary in nature, must allow for multiple perspectives, depends on collaboration across agencies and groups, and presumes a lifelong path of learning that extends through all levels of formal education into a variety of nonformal settings. The task, simply put, is to transform prevailing mindsets to recognize the long-term limits that nature imposes and the need to "nurture, rather than jeopardize, the ecological systems" that support our activities (Smith, 1992, p. 90) [gg]. The Guidelines provide a conceptual framework for environmental education, and they are organized around themes that are well aligned with the ideas shaping education for sustainability. Indeed, some have suggested that education for sustainability has become the new focus and justification for environmental education (Tilbury, 1995; 1997).

The organizing themes for the NAAEE guidelines are as follows:

- Questioning and analysis skills.
- Knowledge of environmental processes and systems.
- Skills for understanding and addressing environmental issues.
- Personal and civic responsibility) [4].

These themes clearly complement the six themes of "Education for Sustainability," and they reflect a connectedness among natural systems, human actions, and the need for individuals and groups to analyze issues, make decisions, and take actions that support sustainable ecosystems. It is also clear from these two sets of themes that teaching for sustainability cannot be relegated to a single course or subject area; the themes of education for sustainability must come to permeate all subject areas at all educational levels [12].

5 Conclusion

The successful green development and implementation of green innovation in an organizational system can produce a significant saving in the amount of business and environment resources and therefore a smaller environmental impact [19]. The successful development and implementation of processes innovation in an organizational system can produce a significant saving in the amount of business and environment resources and therefore a smaller environmental impact [21]. New environment issues dictate the redefining of economic interests in the wake of the recognition, that the natural environment is a limited production factor [10]. The interest of customers, users, developers and others in the environmental aspects and impacts of products is increasing [12]. The theory on the basis of the practical experiences envisages sustainable development planning as a process of continuous improvement [20]. Education helps it. Environmental Excellence in Global Marketing needs Environmental Education as a first step to environment protection.

References:

[1] Woolfe, L. (2002) Leadership secrets from the Bible, MJF Books, New York, NY.
[2] Kralj, D. Krope, J. Goricanec, D.,(2005), "The permanent development as a consequence of administration innovating", WSEAS Trans. Bus. Econ., vol. 2, iss. 2.
[3] http://en.wikipedia.org/wiki/EE/09.05.2008
[4] http://www.naaee.org/programs-and-initiatives/guidelines-for-excellence/20.05.2008
[5] http://www.botany.uwc.ac.za/inforeep/10.05.2008
[6] http://www.ericdigests.org/1.09.2008
[7] http://www.eaca.be/4.08.2008
[8] http://www.ericdigests.org/21.09.2008
[9] Orr, David W. (1992). "Ecological literacy: Education and the transition to a postmodern world." Albany, NY: State University of New York Press. [ED 377 036]
[9] Disinger, J. (1993). "Education." In Rebecca Stutsman, (Ed.), "From Rio to the capitols: State strategies for sustainable development." Louisville, KY: Commonwealth of Kentucky.
[10] Smith, G. A. (1992). Education and the environment: Learning to live with limits. Albany, NY: SUNY Press. [ED 356 554]
[11] Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990's. "Environmental Education Research," 1(2), 195-212. [EJ 509 039]
[12] Munson, K. G. (1997). Barriers to ecology and sustainability education in the U.S. public schools. "Contemporary Education," 18(3), 174-76. [EJ 553 049]
[13] Ogrin U, Kralj D.: *Economic Efficiency and Environmental Management System, WSEAS ED 06, Issue 10, Vol 2, Oct 2006*
[14] ISO 14001:2004(E) *Environmental management system – Requirements guidance* for use
[15] http://www.unglobalcompact.org/05.04.08
[16] http://www.bren.ucsb.edu/08.04.08
[17] http://www.marketingminefield.co.uk/marketing-plan/pestle-analysis.html/07.03.2009
[18] http://www.rapidbi.com/created/the-PESTLE-analysis-tool.html/07.03.2009
[19] http://www.nokia.com/environment/our-responsibility/ environmental-strategy /30.05.2009
[20] Kralj D., Rašič K, Markič M: *Life Cycle Assesnment Supporting Processes Innovation*; WSEAS Transactions on Environment and
[21] Kralj D.,Krope J., Goricanec D.: *The Permanent Development as a Consequence of Administration Innovating*,WSEAS Transations on Bussines and Economics, Issue, Vol 2, 1.17-23 (2005)