

SUSTAINABLE NATURAL RESOURCE MANAGEMENT: CAN SCHOOLS HELP?

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In his complementary keynote address on Educational Innovation for Sustainable Development,** Professor Philip Hughes refers several decades earlier to Rachel Carson's seminal book entitled *Silent Spring*. In that book, Professor Hughes recalls, Carson foretold the *misuse of technology bringing a time of devastation, when there would be no birds left alive to sing, in a ravaged landscape*.

True indeed, for in the next twenty-five years after that shocking doomsday prophecy, man began to experience environmental problems that our forefathers have not been confronted with before. Colonizers laid claim to parts of the globe in search for new pastures. Their governments considered that the lands were there for the taking --- "to be claimed, conquered, defended through military means" (Cunningham, p.6). This insured their "exclusive privilege to exploit" the natural resources therein and marked the death sentence of vast areas of the environment. Then too, Europe's excess population led to the vast number of migrants to settle in their other side of the globe. In quest of a better life, these pioneers of virgin lands held a point of view that the environment will take care of itself. Frontier mentality (Cunningham, p. 7) eased their conscience as they chopped down age old trees that could have protected our now vanishing watersheds; they dug into the bowels of the earth to quarry gold, silver, iron and other metals and minerals, too, and in the process, wrought havoc on the balance between highlands and valleys, between the atmosphere and oceans, between ocean and land, between supply and demand. When industrialization followed, technological development spawned new machines. Increasing population and new lifestyles provided human pressures on the age-old communal relationship between nature and man--- tipping off this relationship to an overkill by man of nature's diverse bounty.

To this day, even while scientists, unrelenting, investigate various concerns on biodiversity, to confront the hydra of a battered Earth, a number of human activities and technologies have worsened the situation. Our own Pasig River in MetroManila which serves like a huge waste bin is an example of polluted waters; Mt Iriga in Bicol and others in the Cordilleras, Negroes Island and elsewhere (Alcala, 49, 35) which were wide forest areas illustrate how denudation can come about and its effects, from cutting down of trees for logging or conversion into farmlands; dried up river beds/creeks such as the Maite Creek which has been the source of water for the town of Valencia and Dumaguete

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City all these years is now in a deforested area. Writing about Maite, Dr. Alcala describes it to be in a "bone dry" condition." "There was no more water in the lower levels of the Maite Creek, probably as a result of little water generated by the forest of Cuernos de Negros."(Alcala, p. 101).

Still the result of human activity is depleting harvest capacity of fish resources. The mass mortality of *bangus* (milkfish) in the Liboran River in Dapitan was caused by a myopic perspective of biodiversity.* It seldom dawns on us that while biological resources are renewable thru reproduction or replenishment, such bio- processes can best prosper only in an environment that can supply the minerals needed for healthy plant and animal life. Colleges have "to change the attitudes and values of students towards the environment and the world of work"(Alcala p.25). Indeed, if we succeed in having this generation learn the value of SNRM, we need not replay Rachel Carson's doomsday scenario.

Fortunately, vigorous efforts are being undertaken to educate all levels and in all forms of education (comprehensive and voc-tech education, formal and non-formal, basic and university) for sustainable development(SD).Given these attempts, there may be a need to review our paradigms for teaching and learning to induce *deep learning*. *Deep learning* may be said to have taken place if there is a change in both covert and overt behavior.

Let us scan briefly the efforts taking place in major parts of the globe on education for sustainable development with focus on the environment.

True to its mission, the UNESCO-UNEP International Environmental Education Programme is one that has crossed international boundaries. It has come out with over 40 volumes in a series on the subject in collaboration with various agencies. One such series is No. 35. Done with the Columbo Plan Staff College, it presents prototype curricula for agricultural schools. Others are on training of primary (s.5) and secondary (s.6) school supervisors, elementary teachers (s.27); Values Teaching (s.13); Non-Formal Education (s.23), Problem-Solving Approach (s.15), Curriculum for Industrial Schools(s.32),etc

Some other efforts in this regard is the United Kingdom's Education for Sustainable Development in Schools (ESD) initiated by Local Authority thru City Councils. Schools, business, civic and other community groups lend various support for the programme. Examples are those of Bath and Northeast Somerset; while in other cases, schools involve Local Authority virtually in all education projects where the key departments are the Environmental Services, Waste Services, and on the part of the school, its Adult and Community Education unit. Other organizations making valuable contributions include the Avon Wildlife Trust, Recycling Consortium, Western Partnerships for SD, etc. The approach is to contribute at an early stage to Local Authority while still developing

*Death of the milkfish was caused by the poor quality of water in the river; hence, low oxygen content. Heavy equipment used to construct a bridge blocked four fifths of the river mouth, open for water exchange between the river and Dapitan Bay, which is the source of sea water in the river, particularly during periods of low tide (Alcala, p. 89).

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strategies and action plans. The school have service agreements with Local Authority to work in a range of different levels, namely: strategies design, project management; funding, support, such as letters of recommendations.

The report provides two specific case studies to demonstrate how these partnerships were developed and how they work in practice to support local schools. One of these is the ESD-FARMLINK which enables local children to learn about where their food comes from and the link between food production and countryside issues. Sheila Gundry, Bath Education Officer involves such partnerships for sustainability of the project. Another approach to supporting ESD is Birmingham's Local Authority 21 initiative of an overall aim for a Sustainable City, with Bill Graham as head of the Birmingham Advisory and Support Service with email :<botanic@rmplc.co.uk>. Its slogan, "Living Today with Tomorrow in Mind," is a catchy one *which implies that the process is a partnership of all those living and working in Birmingham and needs the skills and energies of everyone to make it happen*. The slogan was first coined by Birmingham's Development Education Centre which involves: *creating the circumstances that further development can take place; collaboration with a wide range of services providers to schools and the community; providing unique opportunities to work directly with young people, often involving them in democratic decisions taken within the City; embedding ESD in the curriculum; and school improvement*. The foregoing cases demonstrate the strengthened governmental commitment to ESD which provides all sectors with avenues that were not open a few years back.

A third approach may be illustrated by the involvement of Brighton and Hove Council's Environmental Education Programme which aims to create better awareness of environmental issues within schools, youth groups, play schemes and community groups. As reported, this includes a variety of age groups and pupils with learning difficulties and special needs. The approach to ESD in schools is through the provision of information to people which is needed for them to appreciate, protect and improve their environment. Among the main topics covered through talks and presentations are: litter awareness - includes the cost of cleaning up Brighton and Hove; how litter harms people and wildlife; litter surveys on school grounds; waste management and recycling - ways to reduce, re-use and recycle household waste; main reasons for recycling; applying lessons learnt on "a week's worth of rubbish to see how this can be done;" *Green shopping* - that is, becoming a green shopper - looking at packaging and promoting the *Buy Recycled* campaign; the latter demonstrates that young people can exercise consumer power. The theme on *Environmental Responsibility or What can I do?* explains to learners how each can make a difference. Another slogan, *Thinking globally, acting locally* defines for the individual child his contribution to help sustain the environment.

The same report describes another approach is that of Gloucestershire Education Department which supports ESD in schools by promoting what the County calls FOOTSTEPS scheme. FOOTSTEPS is described as both a *process and a network*. The FOOTSTEPS process which is aimed to help schools to educate towards a more

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sustainable future is explained through in-service training, newsletters and advice. *The process attempts to identify areas of knowledge and skills in the curriculum which lends themselves to helping the school community identify environmental issues which impact directly on the life of the school. Students are taught assessment measures for environmental impact and are empowered to make decisions and take responsible environmental action based around a specific issue. A target is then set and positive outcomes are celebrated locally and if possible, globally. In presenting a common approach to schools, that is, pulling the schools in the same direction, shared training events between environmental stakeholders and the Local Education Authority (LEA) Environmental Education Team is made possible.*

In the United States of America, one of the programs for the lower levels is known as Teaching KATE. Kate is a common girl's name in the US but in the sense it is used, it stands for *Teaching Kids About the Environment*. KATE has ready teaching packages in lesson plan form. For example, a lesson plan by Diana Baucom for Grade 3 under the main theme Forestry is *Attribute of a Leaf*. Here pupils learn about *the attributes and uses of trees, develop a definition of an attribute and discover how attributes aid in the identification of various kinds of leaves* -- leaves that can retain more moisture, leaves that easily dry up, leaves that can reproduce, etc. *Pupils are encouraged to form a leaf collection and learn how to identify different types of trees by finding and collecting leaves with given attributes.* Still under the theme Forestry is Sharolyn Inman's lesson plan on the *Who, What, Where of a Forest* for Grade 2. For 2 to 3 weeks, pupils learn about *the basic needs and functioning of forests and the similarities and difference between different types of forests. They learn about the different products that could be obtained from forests and the numerous other benefits that forests provide. Comparison between a tropical rain forest and one with secondary growth would be a revealing phenomenon to young minds.*

Still on KATE lessons on the theme *Water*, pupils can learn the effects of pollution on our rivers, lakes and wetlands. A lesson plan by Janice Gatman Lee for Grades 11-12 and which would require a total of 18 hours, pupils would. Even as early as Grade 4, an interesting lesson on the countless uses of plants such as that prepared by Shirley B. Oliver could likely motivate children to go into a career involving plants. Man's dependence on plants for a variety of needs is given focus. The syllabus suggests that a professional local forester be invited to give a talk which may likely be full of personal experience and which happened in familiar settings.

Another set of ESD guide is the *Vanishing Species Curriculum* designed by Nancy J. Allen of the Curriculum and Instruction Department, University of Texas. It is a flexible curriculum that can be customized to suit individual classroom need, draws perspectives from community local groups and addresses specific environmental problems and concerns. As explained, *cooperative learning and open-ended questions are emphasized. Students and teachers are encouraged to apply scientific/ technological concepts and problem-solving skills toward the resolution of environmental conflicts and to assume*

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responsibility for their actions. The guiding philosophy of this curriculum is that learning to be meaningful must be constructed by the learner himself. The teacher assists by acting as a guide and a facilitator. By presenting the learner with a rich educational environment, the teacher enables learners to learn for themselves. The lessons reflect a view of science in which understanding is a primary goal with the learner encouraged to see himself as an integral part of nature, to accept responsibility for his actions and to understand there is no conflict between environmental concern and personal good. The series uses stories with universal themes. The designer believes that using stories allows the introduction of emotion, allegory and multiple levels of meaning. The series aims to enhance multicultural understanding, creative thinking and the promotion of respect for the interconnectedness of life.

In the Philippines, the Department of Education, Culture and Sports has included in its basic education list of competencies the knowledge and understanding of a balanced Environment and how it can be properly managed for sustainability. Topics studied in its Environmental Education Programme include the following: How Man Affects Environmental Change, Ecosystems, Biological Diversity, etc. As for institutions of higher learning, some universities, public and private, maintain centres on the subject.

Among several such centres, a top one, is the Angelo King Centre for Research and Environmental Management at Silliman University in Dumaguete City directed by an internationally known Filipino herpetologist and marine biologist Dr. Angel C. Alcala, once a Cabinet Secretary for Environment and Natural Resources and the first regular Chair, Philippine Commission on Higher Education.* The Centre's initiatives such as coral reef restoration and fish sanctuary preservation projects, eg in Sumilon Island in the Visayas provide for non-formal education of cooperating communities. Given all these efforts and facilities, there is a need to make available down to the remotest rural areas teaching materials for teachers of sustainable development. As Dr. Alcala wrote to this writer, "There are many who embrace this concept (SD) but do not have access to relevant studies, data and other information on environmental exploitation." He advised that "the assembling of teaching materials. . . be given extra attention."

My observation after reviewing some teaching materials in the Philippines is that they lack locality. Examples of degradation and aspects of this phenomenon could bring the message more strongly, more experiential to our young people if the examples are on the ecology of familiar grounds. Learners would not only be motivated to help sustain the ecology but *to want* to sustain it. *Wanting goes right to the heart of human urges and feelings* (Race p. 11). *When there is such a powerful urge at work, helping learning to happen can bring about spectacular results.* People usually manage to do what they really want. Since learning is *doing* and in the process, we tutors/mentors provide the *feedback, we need to give time and space for our learners to sort out, to make sense of what they learn and put it into perspective* (Race, p. 18). In other words, we give them adequate time and space to digest. Digesting is *sorting out what is and what is not*

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important to the learner. The bottom line is, digesting provides a sense of ownership on what the learner considers important.

This teaching and learning paradigm may be briefly described as a simultaneous and complex cycle of **wanting, doing, feedback and digesting**. To me, the model brings together the cognitive and affective domains. As the learner begins to "know," he shifts through the information and depending on how the learner is taught, how the teacher's pedagogy lights a fire in him, is of critical importance. When the learner falls in love with the subject matter --- when the mind and heart converge --- would likely ensure behavior change and lifelong learning on the subject. For this reason, locality in teaching materials, exposure to ecological phenomena that may have been taken for granted --- being able to see these in a new light, recognize them and accept their impact on the quality of life --- these stages in the teaching-learning process would likely generate in the learner commitment to the environment.

Without localized teaching materials and a paradigm that is consistent with the nature of human learning/understanding, the convergence of knowing and wanting and as Buscaglia phrases it ---as loving and learning--- all efforts toward ESD may truly only come to naught. As Nancy Allen's introduction to the *One Spirit, Many Forms Curriculum* reminds its readers: *In the end, We will conserve only what we love; We will love only what we understand; And we will understand only what we are taught.* With apology on the above quote, I would rather say: "And we understand only what we have deeply learned."

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