

LITERATURE REVIEW

ENVIRONMENTAL EDUCATION AND PUBLIC AWARENESS

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Introduction

Even though growing public awareness about environmental issues is evident, lack of adequate environmental knowledge can play a big role as an obstacle towards achieving a sustainable future for humankind at both global and local scales.

Proper media-assisted civic education and awareness campaigns regarding the importance of environmental health are vital to enhance the protection and well use of natural resources, and to reach a sustainable future in any community. This review distinguishes and relates environmental awareness and environmental education, and considers how they are implemented in different contexts.

Environmental Education

Environmental education (EE) is a cross curriculum topic promoting global awareness, sustainable living and active citizenship. It involves a structured and planned process that seeks the implementation of environmental curriculum at educational institutions at different levels (elementary school, high school, university, graduate and post-graduate levels). Cross-cutting subjects that are integrated in a global perspective but that can be learned and applied locally should implement this curriculum (10).

Based on these principles we might assert that EE should be multilevel and continuous. A first educational level should target special programs for non-formal adult and community-based audiences. The second level focuses on secondary school. It involves teaching the main disciplines within an environmental context. The third level focuses on obtaining environment based professional skills within the different professional disciplines (10).

An urgent need to educate humankind on conservation and sustainable uses of natural resources through environmental education has been accepted as a global necessity. The concept of environmental education gained great momentum at the UN conference in Stockholm in 1972. In Agenda 21 a holistic view of EE was adopted and acknowledged by 175 countries at the first UN Earth summit in Rio de Janeiro on environment and development. (19).

The now famous “Agenda 21” identifies education as a vital aid to support all the needed changes for sustainability to take place. Signatory nations agreed to pursue actions to include environment-sustainable development as a cross cutting matter in curriculum at different levels of education, and also to ensure it reaches different audiences, including those located at remote communities (19).

As Smyth (1995) lays it out, “Agenda 21 signals the need for a clear lead from the top and for facilitation of collaboration between the main interests concerned, in national and local government, government agencies, formal education, the business sector, cultural, community and youth organizations and the voluntary sector. All of these are concerned in different ways with direct educational activity and services, whether formal or informal, with staff training and with exemplary environmental practice and there is an often unrealized potential for collaborative programs.”

The main goal of Agenda 21 is that all signatory countries incorporate EE into their educational systems at all levels. Norway and Malta represent two examples of countries that are trying to implement environmental curricula in their educational systems. They have both experienced difficulties but they have also made progress. Their efforts deserve analysis because they demonstrate many positive aspects that can be applied elsewhere if locally adapted (19).

It is obvious there is a need to tackle environmental problems globally by means of a systematic process that requires changes in traditional education schemes. The entire scientific community is reasonably responsible for getting involved in adequate public relations efforts that enable communication of its research, concerns and uncertainties, to the institutions, organizations and governing bodies responsible for education. Similarly establishments responsible for education should make efforts that direct to the public information received from scientists in effective and understandable ways (7).

Environmental education in Norway: A study case

Norway is a country that is trying to use a systemic approach to implement a national environmental education system. Even though many elements of the Norwegian experience can be applied elsewhere, it must be understood that these types of initiatives have to be locally adapted to the particular needs and circumstances of each country. In this case four areas of system change were identified: commitment, curriculum, competence and cooperation (2)

In “A Systemic Approach to Environmental Education,” Benedict (1999) points out;

“The goal of the Ministry of Education's strategy was that all pupils should receive environmental education in line with the UNESCO goals, including both knowledge, attitudes, capabilities and behavior. A rather large group of teachers, researchers and organizations was involved in developing the strategy, which went through several stages of revision and is still being periodically revised. Thus, the Ministry of Education itself has taken a leading role in initiating change. Staffing (one full-time position) and a substantial budget was allocated to this work, which was led by the Ministry of Education.”

According to Benedict's study (1999) the goals of the Norwegian strategy were oriented toward the system as a whole, not individual schools or programs.

Goals:

- 1) Clarify the goals and contents of environmental education.
- 2) Contribute to organizational development in schools.
- 3) Ensure that the strategy is implemented.
- 4) Clarify and coordinate efforts in environmental education between the school system and its cooperative partners.
- 5) Evaluation.

These goals touch on three of the four 'Cs': *commitment* and responsibility, and on the part of the Ministry of Education, *competence* and *cooperation*. *Curriculum* was being dealt with in a general curriculum reform so it did not appear in the strategy goals (2).

According to Benedict (1999) the most important lessons learned from the Norwegian case are:

“First, shortcuts don't work. Teachers who struggle to implement systemic environmental education within the framework of an educational system that isn't made for it may succeed in the classroom in the short term, but their efforts are

usually not sustainable. Teachers cannot succeed without support from the higher levels and the Ministry of Education cannot do well in conducting educational development without full cooperation from teachers and principals.

A second lesson is that the process of bringing about systemic changes in priorities, competence, curricula and patterns of cooperation and communication is a long-term process. Experiences in Norway indicate that raising teacher's competence in environmental education will require much more than short in-service training courses, although these kinds of courses can be effective in initial awareness raising. Understanding the cross-cutting elements between natural and human systems is intellectually challenging and requires openness to a wide range of disciplinary paradigms, from history, anthropology and literature to economics, biology and political science.

A third lesson is that structural changes in communication and cooperation require patience, goodwill and commitment. Vertical communication between the Ministry of Education and local bodies such as municipal school directors and schools is full of tensions. Some sort of compromise by both parts and understanding of the roles and responsibilities must be reached if change is to be possible."

Cooperation between the Ministry of Education and Ministry of the Environment in Norway is also a sensitive subject. They can easily step on the other's "territory" and put at risk vital mutual aid. Cooperation and network building between the school and external players is fundamental to efficient environmental education (2).

Environmental Education in Malta: A study case

Malta has a typically a highly centralized education system where teachers are very rarely, if ever, consulted about curricula. As Pace notes (1997), elementary school curricula are essentially fragmented and mono-disciplinary, making interdisciplinary learning hard to apply. Even though environmental topics have become much more relevant in recent years in secondary schools, it is also fragmentary (16).

While environmental education is not a national Maltese priority, at least there is a growing awareness phase by government and other organizations where the need to incorporate environmental topics into their educational system is being recognized. Different organizations have included environmental education in their agendas. However, they have been forced to work in an uncoordinated way due mainly to a lack of official support and organization (16).

As Pace (1997) declares, "In an attempt to improve the situation the Education Division, the Environment Secretariat, the faculty of education and some NGOs jointly organized the Second National Training Workshop on Environmental Education in Malta (May 1995). The goal of the event was that of getting all those involved in environmental education together to; become aware of the state of environmental education in the region, identify the problems, needs and support required for the successful implementation of environmental education initiatives and, to discuss the possibility of coordinating these initiatives so as to improve their effectiveness".

While Malta has a long way to go before a national environmental education strategy can be fully implemented in their educational system, the country has at least recognized the intention

of incorporating environmental education into their education system and some efforts in this direction are being produced.

Environmental Education in Children

Childhood is perhaps the age that fathers the most important memories in a person's life. Most adults retain and unconsciously use information commencing from upbringing experiences. It is during this early stage where personality begins to take form. Almost everything that children learn is provided in different ways by the outside world. The natural environment is a significant component in this learning process (18).

Children are very emotional and sensitive about everything they learn. They can easily be attracted or repelled by any topic. Environmental education must not be presented to them with a sense of doom or disaster so they don't avoid or dislike it. If they feel the natural world is a universe of problems they might not want to deal with it at all. Children should be given a chance to bond with the natural world before they are asked to heal it (18).

Kids learn better when they focus first on local issues and globalize after. As noted in Sobel's report (1995), local environments should be the basis for curricula with six through nine year olds. Only after they are able to think in an analytical manner can they learn in a global way (18).

EE and community conservation needs should be viewed in a continuous and progressive perspective. A study conducted during a 4-week period in the town of Quebrada Ganado, Costa Rica by Vaughan et al. (2003), revealed that if EE programs for children are guided in a proper way, parents and other adults could also benefit from them. Knowledge gain passed on from children to parents (and other adults) indicates that awareness can be delivered in a consecutive way from the classroom to the community (22).

Environmental Awareness and the Public

Environmental awareness relates to the recognition by the public of environmental issues and values, and the implications they have in relation to economic issues and social standards of living (4). It is best produced and developed by personal exploration and discovery of people's surroundings (23). Public environmental awareness and participation is vital to the goal of achieving a sustainable future. Social involvement in this course of action can only happen when the communities are aware of the importance of maintaining healthy and productive ecosystems (6).

Environmental public awareness is shaped by economic, social, professional, religious, ethnic, cultural and educational factors. Civic context must be well understood before an awareness campaign is planned. The most appropriate way to deliver context-aware information will often depend on the activities and type of social interaction the target groups experience (12).

Public environmental education and applied communications are the key tools for expansion and effective delivery of awareness campaigns to different types of audiences. Campaigns and programs should be designed in a sustainable way to assist target groups with the acquisition of knowledge, skills, and attitudes that are necessary to solve actual and local environmental problems (1). Outside and intersectional cooperation may be necessary to initiate them. Partnership efforts between different institutions, like government and nongovernmental organizations, private businesses or educational entities, are means that can produce positive results in communicating environmental topics (19). Effective communication among scientists,

academic institutions and different type of organizations is critical to this process, but the main purpose is that the general public somehow embraces the application of sustainable and ecologically sound policies (1).

Effective Use of Media Outlets

The media's role in environmental education is important because it is through newspapers, magazines, radio, and television that people gain awareness. Awareness is simply a step in EE. Modern communications have provided information for the growing public demand of related information; we now see more environmental magazines, newsletters, and journals, along with TV and radio programs (8). Recently, public radio and television broadcasting considers all of its programming to be educational by including topics like science and nature, drama, music and dance, in addition to varied civic issues. It has a vast delivery span given the fact it can reach audiences in homes, schools and public places (13).

Communicating environmental information is very challenging due to the dynamic and complexity of natural systems. The ways in which science has conventionally related with society must be reassessed and adapted to get in touch with current environmental and social realities. The scientific community must focus on learning to communicate more effectively (1) with policy officials and educators. With proper conduction, media can offer us good communication tools that can be used as educational aids to reduce the gap between scientific knowledge and civic awareness.

Scientific groups, journalists and non-governmental organizations play a major role in environmental public education processes. Scientists are among the first to come across evidence of detrimental environmental impacts resulting from human-related activities. However, due mainly to cultural clashes, these groups frequently experiences difficulties in knowing how to efficiently communicate their discoveries between themselves and the general public. It has been recognized that with the help of well-informed communication professionals, proper information exchange among scientists, communities and non-governmental organizations, significantly increases public awareness of environmental issues. This occurs best when well-designed and cooperative communication strategies are put in place (1).

As Allen (2001) says; "Scientists and journalists have had plenty of positive interactions. Yet despite the idealistic motivations of scientists and professional journalists, chaos and hard feelings sometimes characterize the interactions between them. Such discord is largely the result of a clash of two cultures, science and the newsroom. Framed simply, science is the world of labs, publications, peer review, and acceptance according to the values and norms of science. Journalism's task is to inform the public speedily, to detail history on the run."

Leal Filho (1995) declares; "to ensure didactic potential of the media for environmental information and for environmental education is fully used, there are a number of items, which need to be considered. Some of these are:

- Diversity of information: newspaper articles, as well as television and radio programs may be used as resource materials for classroom-based lessons provided that due guidance is given and that the issues discussed may be closely related to curricular themes.
- Time relevance: the use of printed or broadcast materials ought to provide a supply of recent information with up-to-date details.

- Accuracy: Teachers and others using the media for environmental education should be aware of this reality and try to carefully select materials prior to use, so that misunderstanding and misinformation may be prevented.”

Filho (1995) also notes that in the relatively short history of "the environment" as a social problem, public concern has been cyclical and so has the media coverage of environmental news.

Maps, Radio and Video

Production of artistic community maps has proven to be a successful tool in developing a cost-effective yet efficient way to increase community awareness. According to Wood (1994), what we communicate with maps is our relationship to the territory we inhabit. Maps are also a way of communicating with the environment that can be stimulating, emotionally linking and context-aware. A map can be produced in a participatory way where members of the community (including kids) contribute with the information and ideas. This creates a “sense of inclusion” and thus, the map becomes an excellent tool both as an educational aid to create awareness, and as a public participation tool that helps unite the community (23).

Even in the poorest and most remote communities, radio ownership is high. Therefore, it is an excellent medium that permits messages to be delivered to large audiences at low cost (15). When radio broadcasting, reinforces environmental awareness campaigns, changes can be positive and significant. The use of this media is very effective in producing a “sense of place” (20) to their audiences. It is very important to create a feeling of connection to our immediate surroundings if we keep in mind that our lives are based on everything that surrounds us.

In Botswana radio is being used to broadcast to adult audiences environmental information. The programs target adult receptors that are either taking part in educational activities such as environmental campaigns. These communication strategies involve active and guided group listening. The difficulties in this initiative are how to make sure the programs increase and embrace audiences and how to determine if listeners are learning from the programs (15)

Tyson and Snyder (1999) examined the effectiveness of direct mail video campaigns used to move the public towards the acceptance of positive values and attitudes in long-term initiatives that focus on the improvement and protection of local natural resources.

Video delivered through the mail has a very good acceptance by the public. Marketing and advertising campaigns frequently rely on this means to deliver their messages since it became noticeable that most unsolicited videos are actually watched by people. Environmental organizations occasionally depend on it to increase memberships. Direct mail in general can lead to knowledge gains in specific groups given the fact it can target more precisely. Another advantage is the relative novelty it enjoys. Also, it can be inexpensive and simple to distribute. Due mainly to its simultaneous audible and visual character, it is easier for video to deliver information and captivate audiences more rapidly than printed material (21).

Environmental Awareness in Central Florida: Community Perspectives

A recent study conducted by De Lorme et al. (2003) reviewed the connection between human growth, development and water resources in central Florida. By including six focal groups, the report was based on the importance input from the community had in contributing to the preproduction stages of a public educational campaign in the region. The groups recommended five messages and five key delivery options that could be included in the campaign (6).

Messages:

- Make clear to homeowners the financial advantages of long-term water management practices.
- Promote self-efficacy at home.
- Make evident the association between quality of water and quality of life.
- Recognize the demographic characteristics of the region.
- Keep the messages straightforward and brief.

Delivery:

- Water resource information could be delivered through direct mail in utility bills.
- Messages could be delivered through public service announcements and stories on local television programs.
- The use of websites and electronic newsletters can be positive.
- Messages and information could be distributed through educational programs in the school system where parents are able to participate.
- Information kits could be delivered through homeowner's associations (like welcome wagon).

Environmentalism in Latin America and Other Developing Areas

Latin America is very rich in terms of species and ecosystem diversity. Similarly environmentalism in the region is also highly diverse. It is virtually impossible to generalize a situation when each and every country is very different in issues like political stability, economic and social development and even education. In Venezuela different groups often have distinct views and positions regarding natural areas. With a lower incidence, Costa Rica has experienced similar conflict between popular and elitist organizations while In Mexico even the elitist groups see effectiveness in conservation when local economic interests are included in the agendas. In Brazil environmental organizations conflict amid anthropocentrism and biocentrism as they deal with an inefficient and corrupt system (5).

Many external and internal factors shape the work done by diverse environmental organizations and institutions. Local environmentalists recognize the not always positive influence of alien funding on regional needs (5). International organizations don't always recognize that different cultural solutions may be applicable for the same problem in other ways (2). Local leaders are not always concerned with environmental issues, even if they are "environmentally aware". Their political agendas are saturated with political problems like employment, national security, economic development, poverty and development.

Government and non-government institutions have different perspectives on environmental issues and they frequently work in an uncoordinated and self-guided manner. Also, their different educational levels and their sources of funding influence the goals of their agendas. These factors contribute to the diversity of the environmental movement in Latin America (5).

In the case of Mexico and other developing countries the application of ecological solutions to local problems has encounters some obstacles. The most significant ones include the rather new growth of ecology, the comparatively low numbers of well-trained environmental professionals and the ways environmental awareness is being communicated. Ecological information is not being delivered properly to the public mainly because of the above-mentioned barriers (3).

Ecological knowledge without proper communication approaches is next to meaningless when sustainable solutions need to include public involvement. The establishment of crossing points between science, management and communications is a must since the goal of sustainability should benefit all stakeholders, including –and most importantly- the public. The goal is to ease the access, distribution and application of knowledge at all social levels. Solutions must benefit the whole of society. Environmental education is useless if it cannot be functional (3).

Environmental education should be used as a linkage system. In developing countries environmental organizations and institutions should include means that facilitate the practical use of knowledge and information. This only works by applying a systems (or cross-cutting) perspective that encourages collaborative perspectives among all the different stakeholders, including the use of well-designed awareness campaigns (3).

In Latin America there is awareness of the immediate need to find solutions to various aspects of the environmental crisis. It has also been recognized, just like in many other parts of the globe, that environmental problems require the integration of ecological science with social issues. Local traditional knowledge is very useful when it comes to apply sustainable management strategies at a community level (3).

Evaluating Conservation Programs at a South American Zoo

Zoos can play an important role in environmental programs. Gutierrez de White et al. (1994) examined the effectiveness of conservation programs at a zoological park in Cali, Colombia. Research indicated that simple exposure to wild animals is not enough to obtain effective environmental awareness in elementary school children. Better cognitive achievement results can be gained when zoos support educational programs by involving teacher participation and emphasis on practical activities. The study also pointed out that knowledge of students whose teachers took part in the educational program improved considerably. Student's performance was greatly enhanced by adequate preparation and reinforcement of wildlife conservation information, as well as by active participation. Results obtained from this report are being used to develop new educational campaigns for children in Colombian zoos (9).

Environmental Awareness Seminar in Swaziland

Nkosi (2002) carried out a community oriented education program on biological diversity, conservation and sustainability in Swaziland. It emphasized the need for a public education program. This program was intended to be seen as an investment in the people by teaching them a self-regulating culture that would help raise awareness of the role biodiversity and conservation can play in sustainable development among the most vulnerable communities in the developing world (14).

Awareness and Sustainability in the Most Vulnerable Communities

Madduma Bandara examines the need to increase awareness of the interactions between human activity and environmental change based on the HDGC (Human Dimension of Global Change Programme) perspective. In addition to that, the whole issue is referred to various international conferences (UN-CHE, IEEP, UNEP, Tbilisi and UNESCO/CEA) regarding the impacts global

environmental education has on the poorest and weaker groups in developing countries. This reading also talks about the target groups for these educational initiatives but also notes what he calls “a continuing need to reach out to the unconverted groups in most developing countries”(12).

Although international environmental education has a global perspective, the author identifies “special” target groups with special problems. Mainly populations in rural areas form these groups. Most people in these zones are among the poorest and most ill educated on the planet. They are subject to numerous factors that don’t facilitate the implementation of sustainable management plans, factors that relate to simple survival needs, which are more important to their lives than environmental concerns (12).

Environmental awareness in vulnerable communities in developing countries can be improved through both formal and non-formal education. Mass media, art, and traditional knowledge, are elements that can greatly contribute to the encouragement of environmental awareness in developing countries. Experience has shown that NGOs can be very effective in promoting environmental awareness in poor urban or rural based communities. However, experience has also shown it is undesirable and not convenient to by-pass government institutions regardless of how unsuccessful they are (12).

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