

Citizenship – Introduction

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Professor André Giordan, in a paper presented in June 1999 (at the IUBS/CBE Seminar at the Hungarian Academy of Science on the occasion of the ICSU/UNESCO World Science Conference), recognized three increasingly impactful levels of Pedagogy. The present introduction develops these 3 levels and puts them to use for achieving **responsible citizenship**.

A. Empirical Pedagogy

This is simply a recording mechanism from **Teacher** to **Learner**; the relationship is linear and frontal and involves little active participation from the Learner. This pedagogy is best illustrated by the traditional lecture (*cour magistrale* or *sermon*) or in a modern world by the relationship between TV broadcaster and viewer.

Empirical Pedagogy does transmit knowledge but it has **little direct impact** on **man, society** and **environment**. It may however trigger interest in exploring an idea or message further or take other appropriate personal action.

B. Behaviourist Pedagogy

Learning is favoured by reward and punishment thereby conditioning the behaviour of the learner. “Good” conditioning leads to “good” or desirable behaviour. Most training follow this pattern.

Behaviourist Pedagogy has definite impact in changing immediate or even long term behaviour. It may not, however, change the person in any radical or profound way.

C. Constructivist Pedagogy

In this case the teacher or guide starts from spontaneous needs and natural interests of the individual learner. Construction of knowledge and modification of attitude leading to new behaviour is operated mainly by action and expression of learner representation. Different level of confrontation motivate pupils, namely those between

learner -- learner
learner -- reality
learner -- teacher
learner -- concepts.

The result of Constructivist Pedagogy as applied to Biology would lead to truly **biologically and environmentally literate citizens**.

PERSPECTIVE ON SCIENCE, SOCIETY AND ENVIRONMENT

At that same conference (World Science Conference) the then Director General of UNESCO (Federico Mayor) described how the first two-thirds of the 20th century was dominated by the **hard physical sciences, technology and engineering** whereas the latter third of the century concentrated on developing a **synergetic relationship between science and the arts, science and society and science for human welfare** - again, pointing the way at **citizenship** Mayor further argued that a key condition for literate citizens to operate successfully and have a real impact on human welfare is **democracy**, a mechanism for citizens to have a voice and make choices.

The present author (Atchia, 1977) showed conclusively that the acquisition of concepts had an impact on behaviour but that the mere memorising of information had none. These findings point clearly to the value of Behaviourist and Constructivist Pedagogies in developing citizenship.

On a practical level, the impact of the elementary, basic or primary school in the whole process of human education is strongly recognised by many. In this context “elementary” does not mean “simple” (French *élémentaire*) but it means **providing the main elements a child needs in life** for learning to be, to behave and for becoming equipped to deal with the world. In the words of Prof. Werner Arber, Nobel Prize winner and ex-chairman IUBS, science permits both **an insight into our complex world and our complex being** and **applications leading to prosperity**.

The whole of the above must necessarily be grounded in **ethics** which Ludo Abicht described as **the deeply regretted but firmly abandoned spouse** of some present day civilisations. We have witnessed in the last century a gradual loss of ethical consciousness itself. A true and major aim of biological education for citizenship is to relaunch such ethical responsibility in this new century, an era which promises to combine both of F. Mayor’s categories that is **hard physical science and technology** and the concern of science and scientists for **society and human welfare**.

PERSPECTIVES ON CITIZENSHIP

The definition of citizenship

Having citizenship in a country not only means owning a passport from that country and having the right to live, work and vote there. Citizenship in any community means actively participating in the life of that community.

The rights and responsibilities of a citizen

Participation in the life of the community can take many forms. In addition to voting, we, as citizens of a nation state, have the **right** to be informed about the affairs of the community. To be effective citizens, we must have familiarity with and discuss and debate the major issues facing the country today. We also have the **responsibility** to obey laws, to

respect the rights of others, to care for the well being of the community, and to protect the resource base on which the wealth of our nation/state depends.

Citizenship is not limited to one political community

But, we must step back and acknowledge that we are also members of other broader communities, continents, oceans, the human species, the biosphere itself. Can this concept of citizenship be applied to the environment?

As far back as the mid-seventies (in Belgrade 1975 and in Tbilisi 1977), the United Nations drew up recommendations which have since constituted the framework, principles and guidelines for environmental education (EE) at all levels - local, national, regional and international - and for all age groups both inside and outside the formal school system. The consensus is that the goals of EE are:

- ◆ **To foster** clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- ◆ **To provide** every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- ◆ **To create** new patterns of behaviour of individuals, groups and society as a whole towards the environment.

At the World Conference on “*Education for All*” (WCEFA, Jomtien 1990) Atchia stated in the name of UNEP, that “**Environment literacy is an essential part of literacy**”. The idea received general endorsement. The environment had achieved with this simple statement the status of a “must” for all education. Since the main aim of development is to improve quality of human life; for this improvement to become and remain sustainable for generation after generation, (in the “overcrowded barracoon” the world might become if we let go), we must accept a duty to seek harmony with other people and with nature and exploit the “good of the earth” rationally. The guiding rules are that people must “share with each other and care for the earth”. (Caring for the Earth IUCN/UNEP/WWF, 1991).

A new concept, that of **environmental citizenship**, has recently emerged as a new way to perceive environmentally-friendly behaviour, a proper and effective way to act if we wish to respect the above objectives of harmony with other people, harmony with nature and caring for the earth.

Environmental citizenship is a concept which joins, side by side, **both the rights to enjoy and benefit from the environment and responsibilities for its protection and enhancement**. Being an environmental citizen means having the knowledge, motivation and commitment to working individually and collectively toward sustaining a healthy environment. Environmental citizens are those people, communities, and organisations who are informed about their place in the biosphere, and who act responsibly on this basis. Although governments have an important role to play, our goals cannot be realised by government action alone. Environmental citizenship is about doing - purposeful right actions, not just about learning (specially academic learning) which is cut off from active daily life.

The necessity of environmental citizenship today

The challenge that each human community faces today is balancing the overall development of human society with the ecological health of the planet. It is in the interest of human beings to maintain the environmental life support system on which they depend.

Without an active and informed citizenry this will not be possible. Defining a new social and ecological balance will require that people understand their place in the community of life, that they recognise responsibilities toward this community, and that they be prepared to take action on this basis.

Environmental citizenship can contribute to the achievement of environmental and developmental goals.

Environmental citizenship improves the quality of public policy. In the public debate surrounding issues of environment and development, active and well-informed participation stimulates the generation and implementation of good policies that are in broad public interest, not just in the interest of a persuasive minority.

Who can be an environmental citizen?

We can think of individuals, communities, and organisations as all being environmental citizens. All of us have a role to play. To discharge this role properly we *all* need to become environmental citizens, **citizens of planet earth**.

WORKSHOPS ON CITIZENSHIP

WORKSHOP A

Environmental citizenship in action

At home and in the community

Question:

How does each of these simple actions affect resources (biological and physical) and human welfare. Discuss, modify, discard, adapt.

(1) Save fresh water resources. Install water saving devices in toilets. About 75% of indoor use in our homes occur in our bathrooms and toilets, these are single greatest water users. One simple solution is to place a plastic bottle filled with water in the tank to reduce the amount of water used for each flush. One complex solution is to review the entire sewerage and waste water system. One essential solution in both cases is education about the value and scarcity of fresh water.

(2) Install a low-flow shower head. Typically, a shower head will use about 20 litres of water per minute. Low-flow models will use only 6-10 litres, saving not only water, but the energy to heat it too. Better still: take shorter showers!

(3) Have flow-reducers on taps. By attaching low-flow aerators onto your faucets, you will reduce water flow by more than 50%, saving water with tasks such as rinsing dishes or vegetables.

(4) Promptly repair dripping taps and pipes. Leaky taps can waste more than 25 litres of water per day - about 10,000 litres in a year. Check your water meter late at night and then again first thing in the morning. If the reading has changed, there is water leakage. If so, it should be tracked down and repaired.

(5) Turn off the tap. You can save about 80% of the water normally used when brushing your teeth if you just shut it off when brushing. You can save 10 to 20 litres of water by filling the basin when shaving or washing your hands and face instead of just letting the water run.

(6) Hang dry some or all of the laundry. An average automatic dryer uses 35 to 95 kilowatts per month. You can easily save that energy by letting the sun and wind do the work for you instead of buying yet another “electro-ménager” on credit.

(7) Save energy. Check your stove. Check to make sure your stove is fuel-efficient. When using the oven, try to cook more than one dish at a time. Remember to put lids on saucepans and turn the heat down once the contents have begun to boil. If you are using an electric range, pick a pan that just covers the cooker ring. If you are in a community using woodfuel to cook, use one of the energy efficient stoves such as the one developed by the Kenyan NGO “Kengo”.

(8) Check the refrigerator. Defrost your refrigerator regularly to save energy and cut costs. Make sure that the freezer compartment of your refrigerator is well sealed so that it does not have to work harder keeping it cold. Let warm food cool before putting it in the refrigerator or freezer. Warm food and warm air can lead to a build-up of extra frost, which can make the refrigerator less efficient. Keep the refrigerator at a temperature that is not too cold. Always make sure the refrigerator door is closed properly. Use of course CFC free equipment.

(9) Buy energy efficient appliances. Read the brochure or ask organisations like “Friends of the Environment” or various Consumer associations to help you decide.

(10) Reduce pollution. Don't flush paints, solvents, or other potentially hazardous products down the toilet. They will go into a river and in some cases back into your drinking water tap! Think of the fish and wildlife in our rivers and lagoons. Do not throw dangerous chemicals in rivers, canals or on the soil.

(11) Develop citizenship regarding lighting in the home and at work. Turn off lights and appliances in empty rooms and when away from home. Make this a habit. Educate others to do so. Buy or design a “**lights off?**” (or other suitable phrase) label to put up on each switch. In a world of inequity and inequality do your duty if you are one of the “haves”. Reflect on all those families who do not have safe running water, electricity, access to essential services.

(12) **Use solar energy.** Try to use solar energy to heat water, light public areas, provide electricity etc. The sun is the source of all life on earth.

(13) **Move toward self-sufficiency. Boil and/or filter your own water instead of buying bottled water.** The growing amount of plastic bottle waste in our landfills is a big concern. Buy or grow fruit and prepare your own preserves. Cut down completely on the purchase of non-returnables.

(14) **Compost food and yard wastes.** Since food and yard waste makes up about one third of household garbage, composting can significantly slow the flow of waste to the environment. Most food waste can be composted to make a soil conditioner that returns nutrients to the land. Local environment groups can give you advice on setting up compost. Go for and encourage organic farming. Produce part of your own food in a vegetable garden.

(15) **Donate unwanted goods to others that may need them or to a social service group.** Donate something you will miss in a spirit of sacrifice. Better still reduce consumption of manufactured goods and thereby reduce pressure on living and non-living natural resources.

(16) **Don't kill wildlife.** You may not like that spider sharing your home, but don't kill it. It does you a favour by eating lots of other insects you don't like. Instead of stepping on it, carry it outside. Learn about species in and around our homes, help in local conservation groups, plant trees, do not pick or damage wild plants, do not buy any product from endangered species. Do your share to protect ecosystems and biodiversity in your own backyard, so to speak.

(17) **Transportation**, a question of human ecology:

- *Do not utilise motorised transport when you can walk or cycle.*
- *Plan human settlements into communities on a scale where motorised transport and lifts become by and large unnecessary.*
Such settlements are also more conducive to a higher quality of life than huge cities, specially when the community (for example in a housing estate or village) is organised for sharing and friendship.

WORKSHOP B

Environmental citizenship: Information and education

(1) **Environmental Education (EE)**

“Learn about the Environment and teach others”.

There is a broad consensus about the goals of Environmental Education (see page 3 of this paper). *The case for Environmental Education has been made again and again since 1972 or even before. What form should Environmental Education take in this 21st century?*

(2) **Environmental information**

Contact journalists or the police about bad environmental situations. For example, a lorry stealing sand from a public beach or a factory polluting a river with their effluent. Organise if need be pressure groups to fight bad environment practices.

Contact journalists about good environment news stories. Use success stories of environmental activism or of rational environmental planning to help and emulate others. Organise if need be pressure groups to fight in favour of worthwhile environmental causes (e.g. save the whale or the rhino, creation of a protected area). Popularise success stories. A good recent example was the special issue of *Time* magazine on Planet Earth based on the World Resources Institute/World Bank/UNDP/UNEP annual World Resources Report (1998/99).

WORKSHOP C

Genetic Engineering

Question:

Are you for or against patenting of genetically engineered organisms? Are you for or against patenting of discoveries and applications relating to the human genome? Are you for or against consuming Genetically Modified food? Can this planet's biodiversity, can our civilisation survive the spread of terminator genes.*

Research has always been free and traditionally a discoverer's first wish and action has been to publish his/her results. Industrialists have cornered a very considerable proportion of engineering, pharmaceutical, chemical and even agricultural research for their own use. They provided (often considerable) funding and facilitation for, in particular, applied research. The exploitation of some of the resulting patents enabled the companies to recoup their investment, make (often considerable) profit in the process.

How do indigenous cultures and developing countries fit into this pattern?

Should the same apply to research and possible applications in the field of the human genome? Does the "sacred" meet the "scientific" in this case?

How to introduce pupils, students and the general public to the field of biotechnology and in particular to that of genetic engineering?

* genes which makes seeds sterile thereby forcing farmers to buy new seeds each season from a hightech supplier “Observer” (London, U.K.) of Sunday 2.4.2000

IN CONCLUSION

Readers (or participants) are invited to re-examine the definition given earlier in this paper for **citizenship** and propose a new definition which better meets their conceptual and operational needs, keeping in mind the need for both a sort of **universal definition of biological and environmental citizenship** and **cultural variants at national and regional levels**.

Three key questions are now formulated which if answered (on the basis of this paper and other inputs) will give a closer perspective on citizenship.

WHAT IS BIOLOGICAL AND ENVIRONMENTAL CITIZENSHIP?

HOW DOES ONE BECOME A BIOLOGICALLY AND ENVIRONMENTALLY LITERATE CITIZEN?

HOW DOES SUCH A PERSON OPERATE IN ORDER TO IMPACT FAVOURABLY ON HUMAN AND PLANETARY WELFARE?

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