BIOETHICAL EDUCATION AND ATTIDUTE GUIDANCE FOR LIVING ENVIRONMENT

WORKSHOP ON ENVIRONMENTAL COMPUTING

OPEN EDUCATIONAL RESOURCE

BEAGLE Open Educational Material:

Environmental Computing

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Art

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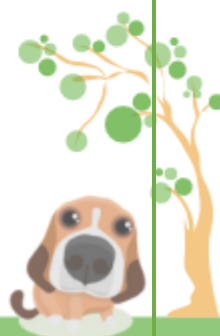
🐾 ENVIRONMENTAL COMPUTING 🐾

Age range: 14-18 years old

Time: 240 minutes (4 sessions of 60 min)

NOTE: There are 12 multimedia infographics and mind maps divided into 4 sessions. Depending on group understanding of given materials and their ability to give arguments and express opinions, you can adjust the number of infographics per session as well as time and number of sessions.

Group: 10-15 participants

Materials and tools: Computer or Laptop, Video Projector, Projection Screen, White Board, Markers, 12 multimedia infographics and mind maps (labelled from S1EEa to S4EEc)

NOTE: If needed, infographics can be printed and shared among the participants

Educational methods: Workshop lectures, interactive learning, and philosophical discussions in a Socratic form of dialogue on environmental ethics and computer technology facilitated with the use of multimedia infographics and mind maps.

Key learning points:

The participants should be able to:

1. understand the main environmental ethical theories

2. evaluate the arguments of different environmental approaches

3. discuss the impact of computers on the environment

4. consider specific practices of green computing and computer recycling

5. think critically and ethically about environmental computing

Introduction:

The following definitions, explanations and philosophical background aim to help the facilitator to deliver the material.

a. What is Environmental Ethics?

Environmental ethics belongs to environmental philosophy and particularly refers to the study of the moral considerations, implications and impact of human activity to the natural world and the living
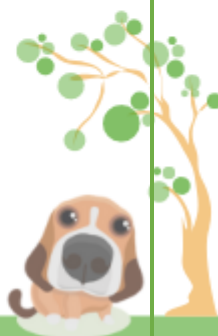
environment. The main theoretical approaches of environmental ethics are: (1) anthropocentric approaches, (2) sentientist approaches, and (3) biocentric, or ecocentric, approaches. (S1EEa)

a1. Anthropocentric Approaches

Definition: The obligations regarding the environment are to be determined solely on the basis of human interests. Example: We can appeal to human interests in order to ground a duty not to pollute the environment — that is, a duty not to pollute unless there are overriding moral considerations. Claim (1): Human welfare or human life crucially depends on such necessities as breathable air, drinkable water, and eatable food. Thus, in the absence of overriding moral considerations, pollution is morally unacceptable precisely because it is damaging to the public welfare. Claim (2): Our duty not to pollute may be understood as based on a basic human right, the right to a livable environment. Thus, we can assert that there is a duty not to pollute. Counter-claim: The problem of weighing the collective human interest in a non-polluted environment against competing human interests, usually, (1) economic (financial limitations, unemployment, limited investment) and (2) technological effects (lack of scientific progress, innovation and competition). Example: An industrial plant, representing a (small, large, massive) financial investment, producing a product that is (unessential, very desirable, essential) to society and providing a (small, large, enormous) number of jobs, pollutes the environment in a (minor, substantial, major) way. (S2EEa)

a2. Sentientist approaches

Definition: the interests of sentient beings determine our obligations regarding the environment. Claim (1): All sentient beings (not just human beings) are seen as having inherent (intrinsic) value (in themselves) and not merely instrumental value. Counter-claim: some things are valuable as a means to some valued end; thus, their value is instrumental. Moreover, sentience is the criterion for determining what sorts of things are entitled to an equal consideration of their interests. Claim (2): the environment should be preserved because of its aesthetic value to human beings as well as we have a moral obligation to preserve some natural habitat that is of no value to human beings if its destruction would harm some nonhuman animals. Counter-claim: sentientism, that is analogous to racism and speciesism insofar as all three can be viewed as giving unjustified preference to one's own "kind". (S2EEb)

a3. Biocentric, or ecocentric, approaches

Definition: our moral obligations with regard to the environment is sometimes said to involve a *biotic* ("relating to life") *or biocentric* view. In terms of a moral standing to ecosystems (=a unit made up of a community of living things taken in conjunction with the nonliving factors of its environment) a biocentric approach is also called ecocentric. Claim: A biocentric approach is also related to "deep ecology": i.e. the well-being and flourishing of human and nonhuman Life on Earth have value in themselves (synonyms: intrinsic value, inherent value). These values are independent of the usefulness of
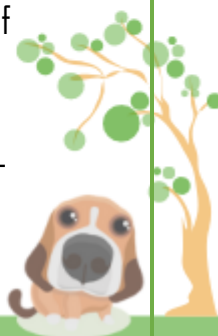
the nonhuman world for human purposes. Richness and diversity of life forms contribute to the realization of these values and are also values in themselves. Humans have no right to reduce this richness and diversity except to satisfy vital needs (Naess and Sessions, 1984). Counter-claim (1): moral consideration is appropriately extended to individual animals but not to other natural entities. Non-sentient natural objects (e.g. plants and rivers), nor quasi-abstract entities, such as species and ecosystems, possess intrinsic value. Counter-claim (2): a third-world criticism to the American deep ecology movement. Change of the sociopolitical basis of the consumerism and militarism (Guha 1989).

a3.1. Deep Ecology (S2EEc, S2EEc1, S2EEc2)

Definition: Deep ecological consciousness is the search for a more objective consciousness and state of being through an active deep questioning and meditative process and way of life. For deep ecology, the study of our place in the Earth household includes the study of ourselves as part of the organic whole. Ancient philosophies (Neoplatonism) and spiritual traditions (Zen Buddhism) go beyond the materialist scientific understanding of reality, the spiritual, and the material aspects of reality fuse together.

Deep ecology criticizes the dominance of humans over nonhuman Nature, masculine over the feminine, wealthy and powerful over the poor, with the dominance of the West over non-Western cultures. *Dominant Worldview* (technocratic-industrial societies regard humans as isolated and fundamentally separate from the rest of nature, as superior to, and in charge of, the rest of creation): (1) Dominance over Nature; (2) Natural environment as resource for humans; (3) Material/economic growth for growing human population; (4) Belief in ample resource reserves; (5) High technological progress and solutions; (6) Consumerism; (7) National/centralized community. *Deep Ecology World-View* (the study of the natural world includes the study of ourselves as part of the organic whole): (1) Harmony with Nature; (2) All nature has intrinsic worth/biospecies equality; (3) Elegantly simple material needs (material goals serving the larger goal of self-realization); (4) Earth supplies are limited; (4) Appropriate technology: no dominating science; (5) Doing with enough/recycling; (6) Minority tradition/bioregion.

Basic Norms (Devall and Sessions 1985): *Self-realization*: challenges the ordinary Western understanding of the self and ultimately requires each of us to identify with the nonhuman world. The realization of "self-in-Self": "Self" stands for organic wholeness. *Biocentric equality*: equal intrinsic worth to "all organisms and entities in the ecosphere." *Experiential*: Experiential understanding should precede intellectual understanding.

Note: For the 8 principles of the Deep Ecology Platform (Naess and Sessions 1984), see S2EEc2.

a.4 Ecology and Human Interest (only for age-range 16-18) (S3EEa)

The following question is raised: *How is the collective human interest in a non-polluted environment to be equitably weighed against competing economic interests?*

Utilitarian approach: a cost-benefit approach or "optimal pollution" = pollution whose harms are outweighed by various human interests, including economic and aesthetic ones.

Libertarian approach: a free-market approach solution to environmental problems is a hands-off government policy that allows marketplace transactions to determine the extent and distribution of pollution.

Humanitarian approach: a value-based approach of environmental justice, i.e. adoption of policies that would require those who benefit the most from the activities resulting in such hazards to bear a proportionate share of the resulting burdens

Eudaemonistic approach: Since human well-being is so intimately intertwined with the well-being of the environment, they point out, we must resist forces of environmental degradation; otherwise, sooner or later, the possibility of human beings' leading healthy and happy lives will be severely compromised.

b. What is Environmental Computing?

Environmental computing refers to the impact of computer technology to the living environment with particular emphasis to the issues of (1) energy consumption and (2) hardware disposal. Ethical awareness of environmental computing is discussed along with specific good policies and practices such as (a) green computing and the (b) paperless society.
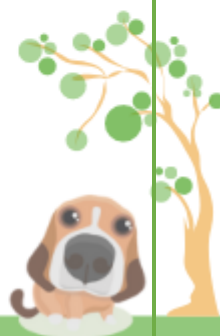
b.1 Energy consumption (S3EEb)

The energy required in manufacturing, the disposition or recycling of computers as well as the energy required to run them are some important environmental problems. Examples:

- <u>Pollution</u>: The semiconductor manufacturing process can pollute the air and contaminate soil and ground water

- <u>Electricity Waste</u>: Every time we leave computers or lights on we waste electricity. Burning fossil fuels generates most of our electricity and it also emits pollutants, and carbon dioxide into the air.

- <u>Energy emissions</u> cause respiratory disease, smog, acid rain and global climate change.

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b.2 Hardware disposal (S3EEc)

Obsolete computers, tablets and mobile phones create another environmental problem. Health problems may result to people and animals from groundwater pollution, toxic gases, and compounds due to disposal of batteries or <u>non-recycled hardware parts</u>:

- Printed circuit boards

- Monitors

- Wires

- Microchips

- Motherboards

Hardware components contain <u>hazardous substances</u> and radiation such as:

- Dioxide,

- Platinum,

- Toxic phosphorus,

- Mercury and

- Heavy metals

Solutions to Energy Consumption and Hardware Disposal (S4EEa)

(1) Recycling hazardous components especially with help of waste-collection organisations;

(2) Upgrading and not replacing old computers;

(3) Donating old computers to schools, non-profit organisation or third-world countries;

(4) Governments have to apply specific laws concerning the disposal and recycling of hazardous components;

(5) Follow green computing: design hardware components with less hazardous substances or radiation.

b.3. Green Computing

Green computing refers to practices, studies and methodologies of environmentally sustainable information and communication technologies. Green computing practices involve a number of daily things that computers users can do in order to reduce environmental and energy costs. Green computing encourages computer users to 'think green'. Suggestions (S4EEb):

1. Do not leave computers running continuously without reason.

2. Do not turn on the printer until it is ready to print.

3. Use screen saver programs.

4. Buy energy-efficient products
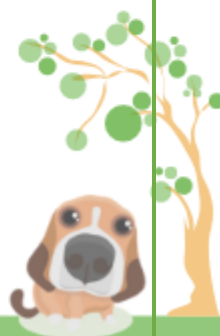
5. Recycle hazardous material such as batteries and cartridges.

6. Buy ecological non-petroleum-based inks.

7. Reduce paper waste

8. Use the dark mode feature that is better for the eyes and eco-friendly.

b.4 Paperless Society

A paperless society is a good solution towards a number of environmental issues concerning paper waste. In the most popular office automation tools the user is able to prepare a *soft copy* of his document presented on the monitor before making a *hard copy* later in a printout. Thus, since the text is displayed on the monitor exactly as it will appear when printed, the user is able to control the unnecessary printouts and organize a paperless office. The aim is to deduce paper waste (S4EEC):

- Minimize hard copies,

- Recycle waste paper,

- Use e-mails instead of faxes,

- Print at both paper sides,

- Buy recycle paper

Step by step - how to do it?

The workshop consists of 4 sessions of 60 minutes.

Preliminary Remarks

- Participants preferably sit in a circular orientation around the facilitator and with view to the screen for the multimedia presentations. Alternatively, the students could sit without an orientation but always with view to the screen and the facilitator.

- In the beginning of the first session, the facilitator presents herself / himself and gets to note the participants. It is suggested that the participants could have a desk stationary note cards with their first names.

- The facilitator presents and explains the aims, the objectives, and the agenda of the workshop.

- The facilitator should create an environment of learning atmosphere in a relaxed and comfortable way. The participants should feel free to express themselves and responds to questions and comments of other participants in a critical but respectful manner.
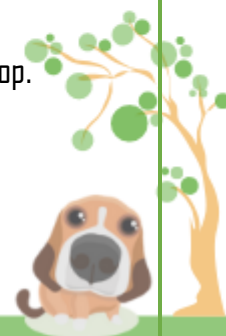
- For younger participants, the facilitator explains some rules of participation such as

  - Raise your hand, if you want to speak.

  - Listen to others carefully.

  - Do not speak at the same time with other participants.

  - Keep notes of the key views of other participants.

  - Keep notes of your claims and thoughts.

  - Express your opinion in a polite way.

Session 1: What is Environmental Ethics?

- Preliminary Remarks (see above)

- The facilitator asks the question: *What is the basis of our moral obligations regarding the environment?*

- Participants express some first views and reflections.

- The facilitator writes down on board key points of the participants' views.

- S1EEa is presented on screen.

- Explanation of S1EEa: The facilitator defines environmental ethics and explains the three main approaches by following S1EEa:

  (1) Anthropocentric Approach (definition, reference to "human welfare")

  (2) Sentientist Approach (definition, reference to "all beings value")

  (3) Biocentric Approach (definition, reference to "environmental holism")

- The facilitator asks the participants to reflect on the above approaches.

- Discussion follows on the participants' first reflections.

NOTE: Additional questions and remarks for developing dialogue should be used, with necessary adjustments, for all of the sessions and infographics. Depending on group, understanding of given definitions and their ability to develop arguments and express opinions, additional questions could be asked, per example:

- The facilitator asks the participants to reflect on the above approaches:
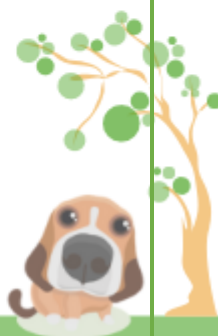
- Did you understand all 3 approaches? Can you repeat them in your own words? Before you continue make shore that participants understood the definitions.

- Do you agree or disagree with this approaches? Why?

- After the participants' gave their opinions, discussion follows on the participants' first reflections (written key points):

  - Are written key points in line with some of the approaches?

  - Under which approach would you put each written key point? Why?

  - Can we put some of the key points in more than one approach? Why?

 - Would you add, delete or change some of key points? Why?

Listed questions are the starting point for the discussions and based on participants' arguments and opinions, facilitator asks additional questions and leads the discussions.

This example of additional questions, as stressed, can be applied to all facilitator's first questions, in regards to all the sessions and infographics.

- The session ends with the facilitator preannouncing the detailed presentation of the ethical approaches in session 2.

Session 2: Environmental Ethical Approaches and Theories

- S2EEa is presented on screen.

- Explanation of S2EEa: the facilitator defines "anthropocentric ecology", positive aspects: human welfare, human rights, concerns: economic issues, technology issues.

- Facilitator raises the question: *To what extent our moral obligations regarding the environment should be based on a human centered approach?*

- Discussion follows and with the facilitator noting key responses of the participants.

- S2EEb is presented on screen.

- Explanation of S2EEb: the facilitator defines "sentient ecology", arguments in favor: "sentientist", arguments against: "sentientism".

- Facilitator raises the question: *Should we consider non-human animals as equally "sentient" being or as equally "different" beings?*

- Discussion follows and with the facilitator noting key responses of the participants.

- S2EEc is presented on screen.
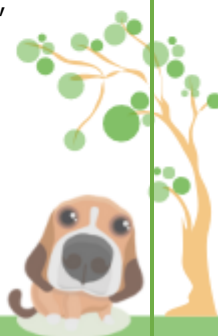
- Explanation (S2EEc): the facilitator defines "deep ecology"; compares, and contrasts the "dominant world view" with the "deep ecology world view".

- If time permits: S2EEc1 "Deep Ecology - Basic Norms" and S2EEc2 "Deep Ecology - Principles" are presented on screen and briefly explained.

- Facilitator raises the question: *Can we realize ourselves in nature as deep ecology asserts?*

- Discussion follows and with the facilitator noting key responses of the participants

- The facilitator ends session 2 preannouncing the next session on ecology, human interest, and the age of computer technology.
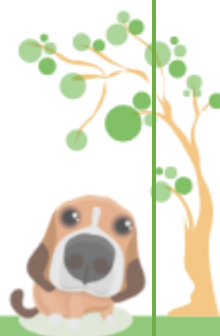
Session 3: Computers and Environment

Only for age-range 16-18:

- S3EEa is presented on screen.

- Explanation of S3EEa: the facilitator explains how the problem of weighing the collective human interest in a no polluted environment against competing human interests, often economic and technological ones.

- Facilitator raises the question: *How is the collective human interest in a non -polluted environment to be equitably weighed against competing economic interests?*

- With reference to S3EEa, the facilitators provides the four different answers: (1) utilitarian; (2) libertarian; (3) humanitarian; and (4) eudaemonistic. Note: for younger audience the facilitator needs to provide some further information about key-terms of the concept map, such as "libertarian" and "eudaemonistic".

- The participants are asked to compare and contrast the above answers and provide their own view.

For age-range 14-18

- The facilitator relates environmental issues and the collective human interest to computers and the digital age.

- The environmental concerns associated with computers are mentioned: (1) energy consumption; (2) hardware disposal

- For the problem of energy consumption, S3EEb is presented on screen and explained.

- For the problem of hardware disposal, S3EEc is presented on screen and explained.

- Facilitator raises the question: *Can we minimize the negative impact of computer technology on the living environment?*

- Discussion follows and with the facilitator noting key solutions of the participants.

- The facilitator ends session 3 preannouncing that the next session will focus on good practices about environmental computing.

Session 4: Green Computing and Green Practices

- The facilitator starts sessions 4 by referring to the previous session (3) and the environmental problems of hardware disposal and energy consumption in relation to computer technology.

- S4EEa is presented on screen with reference to the problem of hardware disposal.

- S4EEb is presented on screen.

- Explanation of S4EEb: the facilitator explains "green computing" and a number of daily things that computers users can do to reduce environmental and energy costs.

- The facilitator asks the participants to share one green computing practice that they are following in their daily life. A discussion between groups of participants on sharing their practices could follow depending on time restrictions.

- S4EEc is presented on screen.

- Explanation of S4EEc: the facilitator explains "paperless office" and the practices to "green an office".

- The facilitator asks the participants to share one paperless activity that they do on daily basis. A discussion between groups of participants on sharing their practices could follow depending on time restrictions.

- Closing remarks (see below)

Closing Remarks

- The facilitator ends session 4 and the workshop by asking the participants to reflect on the current them the three main BEAGLE questions.
  1. *What can I as a person do? (Ethical values)*

  2. What can we as a society do? (Democratic values)

  3. How to live in harmony with the nature? (Environmental values)
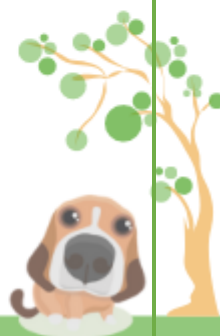
- Note: S4EEa, S4EEb, S4EEc can be used as posters for future reference of the participants in their own practices within their institution, or the wider community. The latter facilitates bioethical education in a wider context of the living environment

Sources and Further Reading

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