

ECOLOGICAL LITERACY FOR A SUSTAINABLE FUTURE: PROPOSAL OF AN “ECO-SOCIOLOGICAL MODEL”

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Abstract: As the world continues to run out of clean air, water and space, it will be all the people who experience the consequences at a global scale. Human survival depends on conserving the natural resources, abating widespread environmental pollution, addressing climatic issues attributed to global warming and, ultimately, creating a sustainable future. Sustainability provides the conservation, protection, and regeneration of resources affecting the future of human health and well-being, the environment and the economy. In order to achieve this, people need to have the knowledge of ecological principles, concerns for a healthy natural environment and skills to engage in environmentally responsible behaviours. In this context, ecological literacy, referred as the ability to use ecological understanding, thinking and habits of mind for living in, enjoying, and/or studying the environment, provides the incentives for the people. This paper focuses on explaining how ecological literacy affects creating a sustainable environment/future and proposes an “Eco-Sociological Model” developed from N.Stanger as an education model for ecological literacy at schools. The model contributes to understanding of ecological influencers/ecosystems (nano, micro, meso, exo, macro, chrono) surrounding humans growing up within social environments. In this age of environmental crises such as air and water pollution, the use of this education model at schools is important in terms of bringing up ecologically literate young people as an investment for a sustainable future through a true ecological lens.

Keywords: Ecological literacy, environment, sustainability, school.

Introduction

As the world continues to run out of clean air, water and space, it will be all the people who experience the consequences at a global scale. This is the confrontation of mankind with the sad truth that has been mentioned by scientists for years but ignored due to the hunger for prosperity and wealth. If the indifference towards the environmental protection persists in this way, mankind will most probably face many more disasters. The underlying reason for all these is people’s ravaging the environment and mercilessly abusing the nature for their own interest. As a consequence of mankind’s actions, many environmental problems such as climate change, biodiversity and deforestation that threaten not only our lives but also the lives of future generations and all other generations stand against and challenge us (Erten, 2004).

Through the 20th century, many scholars and organizations addressed the issues of sustainability because of environmental problems. For a sustainable future, we need to understand that the damage we are inflicting on our atmosphere, water, and soil may be irreparable; and to realize that human behaviour needs to change if we are to sustain our quality of life on Earth (Education for a Sustainable Future, 2000). Seen as a way for sustainable future, environmental education became one of the most important topics to be discussed about in order to contribute to the development of ecological literacy.

Methodology

This paper as review article focuses on explaining how ecological literacy affects creating a sustainable environment/future and proposes an “Eco-sociological model” adapted from U.Bronfenbrenner (1986) by N. Stanger (2011) as an education model for ecological literacy at schools.

Results and Discussion

Why is Ecological Literacy for Sustainable Future?

The need of the world and individuals to maintain their existence in a harmonious balance with their own living conditions has taken the lead in the development of the idea of sustainability (Estes, 1993). According to World Commission on Environment and Development sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Report of the World Commission on Environment and Development, 1987). In the light of the description, sustainability is possible with sustainable decisions made now and in the future, and today's decisions affect the future of human health and well-being, environment and the economy.

According to Manitoba Education and Training (Education for a Sustainable Future, 2000), sustainable development depends on a sustainable human health and well-being, the environment and the economy. As a component of sustainable development, sustainable environment is the one in which the life-sustaining process and natural resources of the Earth are conserved and regenerated. Decisions or changes related to sustainable environment have a significant impact on the other two components and on our quality of life. Therefore, sustainable future entails sustainable decision making for sustainable environment. Sustainable decisions can be made by individuals who have the knowledge of ecological principles, concerns for a healthy natural environment and skills to engage in environmentally responsible behaviours. In this context, ecological literacy, referred as the ability to use ecological understanding, thinking and habits of mind for living in, enjoying, and/or studying the environment, provides the incentives for the people (Bruyere, 2008).

Ecological literacy, or the term "eco-literacy" used first time by American educator David W. Orr and physicist Fritjof Capra in the 1990s, is a way of thinking about the world in terms of its interdependent natural and human systems, including a consideration of the consequences of human actions and interactions within the natural context (Ecological Literacy, 2011). Ecological literacy means that individuals have knowledge about how the natural systems on the earth work and how the effects and relationships of human actions to these systems are shaped. In other words, ecological literacy helps recognition and evaluation of environmental problems, understanding individual responsibilities, developing skills to take precautions and gaining habits to minimize the problems about use of natural sources and environmental pollution. Besides, ecological literacy also means development of habits, attitudes, skills and knowledge that ensures the individuals to establish positive relationships with environment and that contributes to the sustainability of this relationship in daily and a long term basis. In this sense, ecological education is a must in order to train members of society who are aware of living in a healthier environment, the sustainable use of natural sources and the necessary caution while consuming for the needs of future generations (Teksoz, Şahin, Ertepinar, 2008; Woollorton, 2006).

An Eco-Sociological Model for Ecological Literacy

The development of "ecological literacy" is one of the main steps to be taken in solving environmental problems and creating a sustainable future. Starting from pre-school, individuals should be given education in each stage of education system in order for the development of ecological literacy. In this research, we propose "Eco-sociological model" adapted from U. Bronfenbrenner (1986) by N. Stanger (2011) as an education model for eco-sociological model literacy at schools. According to U. Bronfenbrenner (1986), starting from the birth, various environments surrounding individuals have profound effects on their lives. U. Bronfenbrenner (1986) states within the scope of *ecological theory* that there are environments surrounding individuals such as microsystem, mesosystem, exosystem, macrosystem and chronosystem (Figure 1).

Microsystem refers to social and physical environment and deals with close physical range in relationships among individuals and natural processes in the immediate environment of individuals. According to U. Bronfenbrenner, microsystem means the complex relationships between human development and environment and the structures that surrounds and shapes individuals. In microsystem, therefore, individuals are directly influenced by their roles, activities and interpersonal

relationships related to the closest systems such as family, peers, relatives and school. *Mesosystem* consists of interdependent settings that include interaction of several microsystems and development of individuals.

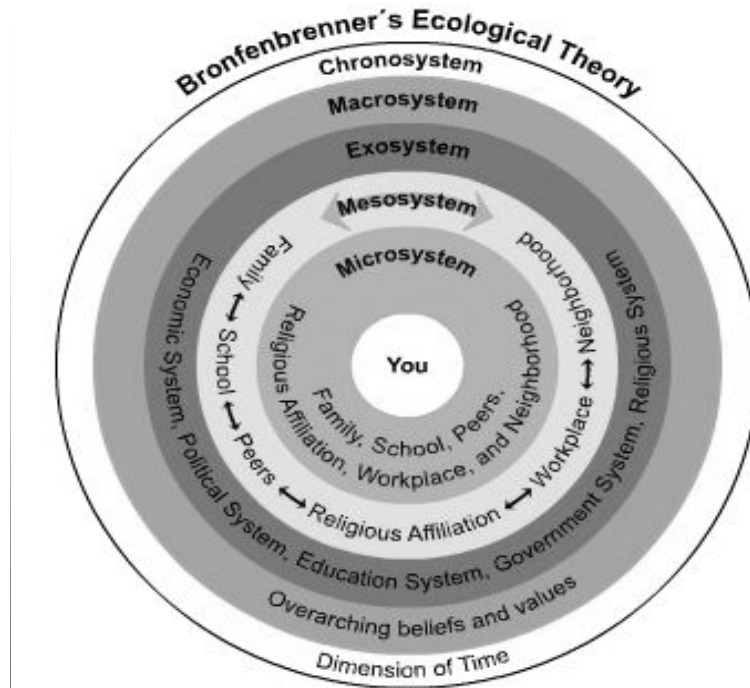


Figure 1. U. Bronfenbrenner's ecological theory (Adapted from Berger, 2007).

Mesosystem establishes a relationship network among various microsystems in individuals' lives. Some microsystems may be closely or remotely dependent to others such as family-school, school-music club and school-sport team.

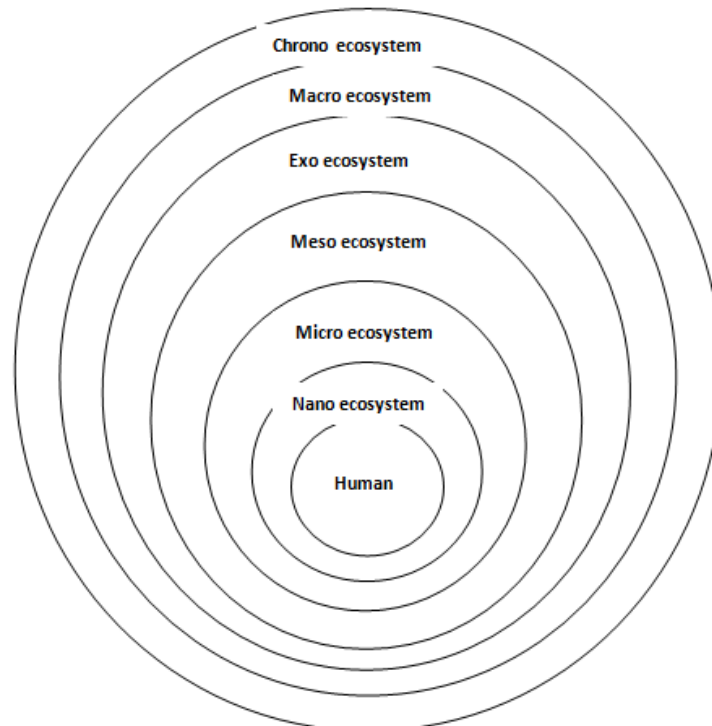


Figure 2. N. Stanger's eco-sociological model (Stanger, 2011).

Exosystem is an extension of mesosystem. This system has an indirect influence on individuals' environment and social systems such as political decision-making and business words are included in this system. In *macrosystem*, however, culture, values of society, traditions, belief system, lifestyle,

opportunities and sources are reflected on micro, meso and exosystems and may indirectly shape individuals lives. The *chronosystem* includes events impacting on particular birth cohort and occurring in the context of **passing time** (Bronfenbrenner, 1986). N.Stanger (2011) developed an eco-sociological model (Figure 2) for ecological literacy in schools based on these environmental systems in U.Bronfenbrenner's (1986) ecological theory.

In eco-sociological model, ecological literacy is discussed at the level of “nano”, “micro”, “meso”, “exo” and “chrono” ecosystems. *Nano ecosystems* represent almost invisible types and components that affect health, metabolism and biochemical compounds that are essential for life. In this sense, external factors like nutrition and stress affect human body and health. *Micro ecosystems* refer to the immediate social networks like family, peers, friends, and enemies as well as the environmental enemies like weather, immediate green space, aesthetic of neighbourhoods and local food systems. The conditions in environment where individuals live, for example weather conditions, may lead to differences in their states of health and general well-being. *Meso ecosystems* are associated with the integrity of the local ecosystems as they are interrelated to social systems. According to this, the integrity of the local systems needs to be understood at the community level such as access to green-space, waste disposal, food production/importing, integrity of water systems and biodiversity because functioning community level ecosystems will have positive influence on life or health. *Exo ecosystems* refer to broader systems like governmental and political systems, economical systems, religious systems and ecological systems.

All of the systems entail understanding the influence of biomes, oceans, and ecosystems' integrity on human health. *Macro ecosystems* refer to the “Earth” affecting all the other system levels mentioned above. Within this scope, physical and mental effects such as climate change, unsustainable development, habitat loss and mass extinction on human life and earth may be taken into account. *Chrono ecosystems* refer to the influence of passing time on environment and human life via all the systems mentioned above (Stanger, 2011). Discussing ecological systems from these levels is important for the youth to easily understand positive and negative effects of changes occurring in every level of ecosystem on environment and human life and to be ecologically literate by making correct ecological connections. However, ecologically literate people have the *knowledge* of ecological principles, *concerns* for a healthy natural environment and skills to engage in environmentally responsible *behaviours*. They are responsible and lifelong learners. In order to accomplish these characteristics, they try to become inquirers, reflective learners, intelligently self-directed, a morally responsible people and also ecologically responsible people (Puk, 2002). With these characteristics, an ecologically literate individual understands environmental realities by specifically identifying their cause and effect relationship and also provides for the shift to an ecological paradigm by affecting other people. This shift to an ecological paradigm is the part of a transition to sustainability. This means that not only meeting basic needs but also creating a vibrant society becomes very important (Ecological Literacy, 2011).

The education of ecologically literate youth in school settings now and in future depends mainly on ecologically literate families and teachers. Therefore, it is also necessary to give education to families and teachers on ecological literacy. For example, the Turkish Foundation for Combating Erosion Reforestation and the Protection of Natural Habitats, whose acronym is TEMA in Turkish, first implemented Ecological Literacy Teacher Training on 18 – 30 September, 2011 as a part of the protocol signed with Turkish Ministry of National Education, the Department of In-service Training. 64 teachers from 30 different cities participated in the training. II. Ecological Literacy Teacher Training was achieved with the participation of 72 teachers from 32 cities and Cyprus, including pre-school and primary teachers. The training programs were implemented by 12 trainers including 5 instructors, 2 members from TEMA Foundation Science Board and 5 Non-governmental Organization representatives. The 77 hour program was created with PowerPoint presentations, fieldworks, workshops and group works. The teachers had the right to arrange both daily trainings and “Local In-service Training” in their cities as a result of the 77 hour program coordinated by Ministry of National Education General Directorate of Teacher Education and Training and TEMA (Ekolojik Okuryazarlık Öğretmen Eğitimi, 2011). Although ecological literacy teacher trainings in Turkey is a late attempt, it is of vital importance in terms of educating ecologically literate individuals.

Conclusions

Ecological literacy is an important in order for ecological learning to occur in pre-school, primary schools, high schools and college level for a sustainable future and in terms of development of potentials of the youth in this sense. The youth who graduate from the school as ecologically literate will be important role models for future generations. Therefore, education given for the development of ecological literacy in schools is crucial. In this study, we suggest the use of eco-sociological education model. The youth will learn thinking together with critical, creative and caring thinking through “micro”, “meso”, “exo”, “macro” and “chrono” ecosystems systems. In this sense, skills, values and practices of ecological literacy are “basics” for sustainability. It will be possible for the youth to be able to understand natural processes enabling life or to present knowledge, skills, attitude, values and understanding for nature thorough this model. The youth who receive ecological literacy education will become individuals who can critically examine nature and natural events, develop ideas for solution of problems and do researches and inquiries in this direction. It will be possible for the youth to develop ecological awareness, learn the principles of nature and establish a positive relationship with nature. Individuals will be sensitive to environmental problems and look for solutions, defend environment rights and, in short, become ecologically literate for creating sustainable future.

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