"BABEȘ-BOLYAI" UNIVERSITY
CLUJ-NAPOCA
FACULTY OF GEOGRAPHY

IMPLEMENTATION OF SUSTAINABILITY EDUCATION AMONG ELEMENTARY SCHOOL STUDENTS BY ACTIVATING THE "GREEN SCHOOL" PROGRAM

PhD Thesis Abstract

Submitted by:

MARCUS ARNY

Scientific Coordinator:

PROF.UNIV. IOAN MAC, PhD

-2011-

Table of Contents

"*At the time when God created Adam, He took him around the trees of the Garden of Eden, and He said to him, "Look at My works, how beautiful and praiseworthy they are! Everything that I have created, I created for you; take care that you do not damage and destroy my world, for if you damage it, there is no-one to repair it afterwards.*"

(Ecclesiastes Rabba, 7:13)

Keywords: "Green School" program, environmental literacy, environmental education (EE), education for sustainable development (ESD), eco-pedagogy, environmental identity, values education, whole school approach.

1. Introduction

Environmental education (EE) is a relatively young area. It relates to a global concern, which gave birth to two historical worldwide documents: The Belgrade charter (UNESCO, 1976) and The Tbilisi Declaration (UNESCO, 1977). These documents raise the need for environmental education as a tool of creating change and developing a population that is aware of the environmental crisis and has the obligation to act on a personal and collective basis to solve environmental problems and prevent the creation of future ones. Thus, environmental education (EE) aims to produce a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems and motivated to work towards their solution (Stapp et al., 1969).

In Israel, the environmental education is still evolving. Educational initiatives, such as the "Green School" program were formed in order to promote sustainable development and active environmental citizenship.

The "Green School" program emerged out of the concept of sustainable development implying that it is not enough to engage only with short term projects. Rather, it is essential to adopt a long term educational process where teachers, students and school management will assimilate a school culture based on environmental principles adopted by school community.

Several researches were conducted in order to evaluate environmental literacy among students. These researches used quantitative questionnaires (Goldman et al., 2006; Kaiser et al., 1999; Leeming et al., 1995; Negev et al., 2008; Morrone et al., 2001).

Little research has been conducted using qualitative tools. To that extent, this study is a pioneer study which aims to present the effectiveness of the "Green School" program as perceived by the students. Thus, there is a need to further develop green environmental initiatives within schools, using successful experiences as an example.

Research aims

a. To examine the students' conceptions regarding environmental issues.

b. To compare students' pro-environmental behavior, environmental attitudes and level of environmental knowledge in three different types of schools (control, green, diligent green).

c. To characterize the different factors within the "Green School" program that affect students' environmental literacy.

d. To evaluate the effectiveness of the "Green School" program in urban elementary schools in terms of the impact on environmental literacy.

2. Theoretical Background

2.1 Environmental Literacy and the Development of Values

2.1.1 What is Environmental Literacy?

The term 'environmental literacy' was first coined by Roth (1992) in 1968. It relates to knowledge, skills and processes acquired from the learner in order to understand the link between man and the environment.

Simmons (1998) defines environmental literacy as the ability to process information in order to make daily decisions, basing on experiences from the real world around us. A man who is environmental literate can discuss environmental problems and actively implement skills, in order to improve his surroundings. Educating people towards becoming environmentally literate means preparing humans to become "global citizens" with two concerns; analyzing the world they live in and engaging with decision making concerning actions taken by their societies (Mac, 2003).

One of the common divisions relates to three levels of environmental literacy (Roth 1992):

a) Nominal level – the basic level that comprise the ability to recognize environmental terms and their significance. It includes the basic knowledge about the way natural systems operates and their interaction with man.

b) Functional level – manifested by a broader knowledge and understanding about the environment. In this level, one can identify awareness and concern, and the ability to analyze information.

c) Operational level – readiness to action, allows the individual to examine consequences, analyze data and choose among relevant alternatives. This level is characterized with an active behavior in favor of the environment in both individual and collective purposes, both in local and global levels.

All three levels are constructed of three dimensions:

a) Cognitive – knowledge and skills
b) Emotional – awareness, concern and values
c) Behavioral – personal responsibility and willingness to act.

These important dimensions (knowledge, attitudes and behavior) emphasize the environmental education as values education, which aim to develop decision making on a value judgmental basis.

2.1.2 The Nature of Values

Values are conceptualized as guiding principles important in a person's life (Rokeach, 1973; Schwartz, 1992).

The development of values is primarily a socialization process (UNESCO, 1985). The influence of society upon individual determines the proliferation of values. An individual's socialization has a strong influence on how his or hers values form, being derived from experience at home, school, religion and others. Values are dynamic through life. Social support is a crucial determiner of a person's commitment to values and modes of conduct. Maslow (1964) identifies the human bent towards a preference for “grown-values” and behaviors – those that help us become the best that we are capable at becoming.

Maslow's ideas are crucial in considering values education, pointing out that it's the task of education to ally them to being conductive to individual growth.

Two main elements of values are beliefs and attitudes. Rokeach (1976) defines a belief as a simple proposition, conscious or unconscious, inferred from what a person says or does. The total of a person's beliefs about physical and social reality is called a 'belief system'. A smaller aggregation of related beliefs forms an attitude, which is relatively enduring organization of beliefs around an object or situation predisposing one to respond in some manner. Thus, attitude is best considered to be a person's degree of favorableness or un-favorableness with respect to psychological object (Ajzen & Fishbein, 2000).

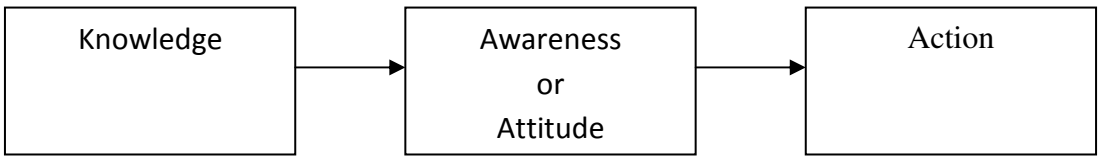
Attitudes are the building blocks of values. The important difference between a belief and an attitude is that attitudes are always accompanied by an emotional elements and a behavioral tendency.

2.2 Towards a Behavioral Change – The Dynamism of Values and Behavior – Models and Theories

2.2.1 The Failure of the Linear Model and The Rising of New Behavioral Theories

Over the last decades diverse psychologists and sociologists have positioned their efforts in exploring the factors which influence environmentally friendly action in order to improve environmental education and communication (Kollmuss & Agyeman, 2002).

The linear model suggests the following scheme for behavioral change:



This traditional model claims that knowledge and attitude lead to action. However, studies show that issue awareness doesn't lead behavior in the environmental dimension (Hungerford & Volk, 1990). The traditional view towards education is that if students are taught knowledge and become aware, their attitudes will be changed and their actions will be altered to coincide with the new knowledge. This linear relationship doesn't accurately represent the human learning process.

In fact, studies demonstrate that there is moderate to no relationship between awareness, attitude and participatory action.

Ajzen and Fishbein (1980) introduced the Theory of Planned Behavior (TPB). This theory states that individual performance of a given behavior is primarily determined by a person's intention to perform that behavior. This non-linear relationship is complicated and affected by a number of factors. These include attitude, subjective norms (the person's beliefs about what should or shouldn't be done) and perceived behavioral control, meaning the person's perception of his or her ability to perform the behavior and believe that it will be effective or will change outcomes.

Hins, Hungerford & Tomera (1986/87) suggest the model of Responsible Environmental Behavior (REB). This model introduces several variables that are strongly related to responsible environmental behavior: knowledge of issues, knowledge of action, strategies, attitude, locus of control and personal responsibility. In addition, a third cognitive component, action skills, was added. The action skills are necessary to apply the action strategies to the issue, providing individuals with the ability to act. Locus of control refers to the extent to which a person feels he or she can act effectively in a situation. A person with highly internal locus of control feels he or she can strongly influence the outcome of a situation.

Theories of altruistic behavior have also been used to explain environmentalism. Schwartz's (1973, 1977) Moral Norm Activation model of altruism (MNA) holds that altruistic (including pro-environmental) behavior occurs in response to personal moral norms that are activated in individuals who believe that particular conditions pose threats to others, and the actions they could initiate might avert those consequences.

Social learning theory, later renamed social-cognitive theory, proposes that behavior change is affected by environmental influence, personal factors and attributes of the behavior itself. The social cognitive theory explains human behavior. A central tented of this theory is the concept of self-efficacy. It refers to one's confidence in the ability to take action and persist in it.

Prochaska and Diclemente (1986) have developed a trans-theoretical model of behavioral change, which proposes that behavior change occurs in five spiral distinct stages: pre-contemplation, contemplation, preparation, action and maintenance.

2.3 Towards an Environmental Activism – Constructing an Environmental Identity

2.3.1 Identity Formation

Constructing an environmental identity is a crucial step towards developing a social activism. Traditionally, the term 'identity' is related to the self – who am I? Who do I wish to be? Identity is formed while the child is detaching himself from what he isn't and creating his own sense of self (Clayton & Opotow, 2003). Some argue that identity is a psychological term that indicates a process. Personal identity does not cease to be shaped during man's lifetime. However, the critical stages of designing one's identity occur in the early age. Identity formation has been most extensively described by Erik Erikson in his Theory of Development Stages (Erikson, 1950). Each of Erikson's stages of psychological development is marked by a conflict, for which successful resolution will result in a favorable outcome and by an important event that this conflict resolves itself around.

2.3.2 Defining the Terms 'Social Identity', 'Environmental Identity' and 'Place Identity'

'Social identity' differs from 'self-identity'. 'Social identity' is describes by the groups to which a person belongs, while 'self-identity' describes the differences among the people within the group.

Social identity theory (SIT), (Ashforth & Mael, 1989) claims that personal interactions in the social environment create the notion of self-identity. The society 'uses' the norms and values to shape the individual, social identity are used so that a social order will be kept.

Thomashow (1996) defines a person with 'environmental identity' as a person who is able to reflect deeply on his behavior. A person who has environmental identity will constantly ask himself: what do I know about the place I live in? What is my relation to plant earth? How do my actions affect the environment?

Kals and Ittner (2003) define environmental identity as a course of action reflects in people's behavior. People are acting in a positive way towards the environment in a way that they are willing to make personal sacrifices (e.g. money, time) in order to promise nature preservation.

Hauge (2007) suggests a theory that links identity to the place a man lives in, namely Place Identify Theory (PIT). This theory underlines the influence of the physical surroundings on

self-identity. The environment and men are described as having mutual relationship. Proshansky (1978) defines the term 'place identity' as a set of memories, conceptions, interpretations, ideas and related feelings about specific physical setting. However, place identity is more than attachment. Place identity is a sub-structure of self-identity like gender and social class and it's comprised of cognitions about the environment. The home is the environment of primary importance, followed by the neighborhood and the school. Here the social and environmental skills are learned and the 'lenses' through which the child will later recognize, evaluate and create are formed (Proshansky & Fabian, 1987). The speculation that individuals who are emotionally, cognitively or functionally attached to s place will act to protect that place was shown to be true, empirically, in several contexts.

2.3.2.1 'From Experiencing Admiration to Action" - A Model for Enhancing Social-Environment Identity.

One of the models that are trying to deal with the issue of developing social-environmental identity is named "From Experiencing Admiration to Action" (Gan, Pizmoni & Peled, 2002).

This model suggests four developmental stages that lead to social-environmental activism:

a) A sense of wonder – positive feeling towards the environment.

b) Knowledge on environmental issues – the need to get acquainted with the environment, to learn and know more.

c) Critical thinking – this stage stands between knowledge and the willing to act. The student at this stage has to choose and construct a desirable attitude.

d) Environmental activism – this is the final stage. In this stage a person is willing to initiate an environmental public campaign, not just for his personal benefits, but for long-term welfare.

2.4 Sustainability – Definitions and Concepts

Sustainability is the capacity to endure. In ecology the word describe how biological systems remain diverse and productive over time. For human, it's the potential for long-term maintenance off well-being of the natural world and the responsible use of natural resources. Since the 1980's sustainability has been more used in the sense of human sustainability on planet Earth. At the 2005 World Summit held by the United Nations (UNESCO, 2005) it was noted that sustainability requires the reconciliation of environmental, social and economic demands.

2.4.1 Sustainable Development (SD)

The concept of sustainable development was popularized in 1987 with the publication of the "Brundtland Report" in the UN World Commission on Environment and Development (WCED, 1987).This concept might be conceived as an outgrowth of two earlier concepts: 'economic development' and 'human development' (Mac, 2008). In 1992, a conference on environment and development was held in Rio and resulted in the creation of 'Agenda 21'(UNCED, 1992). Agenda 21 identifies education as an essential tool for achieving sustainable development and emphasized four areas of action for education:

1) Improve the quality of basic education

2) Reorient existing education programs to address sustainable development

3) Develop public awareness and understanding

4) Provide training for all sectors of private and civil society.

2.4.2 Characteristics of Education for Sustainable Development (ESD)

Education for sustainable development (ESD) is a dynamic concept that encompasses a new vision of education seeking to empower people of all ages to assume responsibility for creating and enjoying a sustainable future (Lasonen, 2009). If ESD is to be effective tool for engaging people in making decisions and acting upon them, a major prerequisite for developing the student's action competence will be their ability to question their current belief system and to recognize the assumptions underlying their knowledge perspectives and opinions.

2.4.2.1 Critical Thinking and Reflection

Reasoning and judgment are the ultimate objectives of critical thinking. Mogensen (1997) claims that critical thinking includes a dialectic perspective. This means that critical thinking obliges the individual to look at a case from several points of view. Giroux (1988) argues that a critical pedagogy needs a language of possibility which underlines the fact that the critical thinker doesn't look for limits and restrictions but, in a creative and open-minded way, searches for and is inspired by ways that have been successful and fruitful for others.

2.4.2.2 Participation

Participation is the heart of empowering people towards action. A crucial feature in ESD is that students participate in decision making and feel they have degree of ownership over the project. Hart (1992) has developed a model, using a ladder as a metaphor for the different degrees of initiation and collaboration children can have when working on environmental projects with adults. The ladder includes eight steps from manipulation to sharing decisions.

2.5 Eco- Pedagogy

The eco-pedagogy is an outgrowth of developments in critical- pedagogy. The purpose of critical pedagogy is to engage the learners to perceive social, political and economic contradictions and to take action against the oppressive elements of reality (Freire, 1995). The teacher is perceived as the 'committed intellectual' who acts to change the world through the dissemination of knowledge (McLaren, 2005).

2.5.1 Eco-Literacy (Ecological Literacy) and Transformational Learning

Capra (1997) defines 'eco-literacy' as the understanding of the principals of organization that ecosystems have developed to sustain the web of life. Problems cannot be understood in isolation but must be seen as interconnected and inter-depended. We must learn to engage with complexity and think in terms of systems in order to address current ecological, social and economic problems.

Transformative learning enables to move from values to action. This is the process of becoming critically aware of one's assumptions and then reworking the very basis of our belief systems and then to put this new perceptive into practice.

2.5.2 Critical Pedagogy of Place

A critical pedagogy of place challenges all educators to reflect on the relationship between the kind of education they pursue and the kind of places we inhabit and leave behind for future generations (Gruenewald, 2003). Critical pedagogy emphasizes social and urban contexts. For critical pedagogues, the 'texts' students and teachers should 'decode' are the images of their own concrete, situated experience with the world.

2.6 The Whole School Approach

A whole school approach calls for sustainable development to be integrated throughout the formal sector curriculum in a holistic manner rather than being taught on a standalone basis. In practice, this approach means that a school will incorporate teaching and learning for SD through sustainable school operations, such as integrated governance, stakeholder community involvement, long term planning and sustainability monitoring and evaluation. Sabo (2011) states that such a conceptual shift from former educational paradigms necessitates to reconstruct the education content (plans, programs, textbooks, teaching-learning-assessment strategies) and to promote teaching strategies that are based on investigation, testing, decision making and active involvement.

Whole school approach also advocates for active and participatory learning and calls for the entire school, including students, educators and administrators, to be actively engaged in working towards a sustainable school. Commitment to change is required from all stakeholders from grassroots activists to educators to policy makers.

Shallcross (2003) suggests a model of five strands cycle that underpin the whole school approach: formal curriculum, community links, research and evaluation, social and organizational aspects and institutional practice.

Thus, participation and modeling are valuable elements in the whole school approach.

2.7 Environmental Education in Israel

The environmental in Israel is under remarkable pressure and is the subject of increasing public knowledge and concern. The country is located at the meeting point between three continents and contains both desert and populated areas. It's characterized by diverse habitats including arid, semiarid, temperate, Mediterranean and subtropical climatic conditions. During the last 60 years, Israeli population has grown dramatically, from 1 million to 7 million residents, mostly through immigration. Furthermore, while the standard of living has reached European levels of prosperity (Orenstein, 2004) the population growth has resulted in a broad range of environmental hazards and lower level of environmental literacy. It became apparent that there is a need to promote levels of environmental literacy among students in the educational system, in order to produce a future citizen that is knowledgeable, aware of and motivated to act towards the solution of environmental issues.

2.7.1 Environmental Education in Israel – Historical Review

The Israeli environmental education has gone through different stages. The primary educational paradigm evolved in the early years of the nation. Its main attribute was preservation of nature and its educational implication was nature respect and admiration. In 1980 the Ministry of The Environment was founded and curriculum concerning environmental education had begun to develop as environmental sciences. In high schools a new optional subject was proposed and awareness to environmental issues had begun to evolve. However, environmental education remained a non-compulsory subject in the elementary educational system (Goldman et al., 2003).

2.8 Environmental Education in Israel - The Current Situation

Today the subject of the environment is learned in different school subjects. The Israeli science and technology curriculum defines the need to provide scientific knowledge to every Israeli student, based on the understanding that science and technology are part of a general knowledge that is required to the citizens of the future. The second national curriculum which incorporates environmental education is geography and civics.

The environmental education is integrated in the curriculum by using actual events and addressing them in class. Primary teaching methodologies includes problem solving methods, experimentation and outdoor activities.

Practicing EE involves several difficulties such as: teacher training, school's structure, the nature of the subject and the learning process itself.

2.9 Special E.E. Programs in the Elementary School System

Special local initiatives exist in hundreds of school across the country where parents, teachers and community as a whole seek to instill environmental issues. These schools are getting a support from the Ministry of Education and the Ministry of Environmental Protection. The primary object of these initiatives is to encourage the school and its community to engage with environmental action.

2.9.1 The "Green School" Program

This program was set off in 2004 as a governmental nationwide initiative to promote sustainable development. The program is steered by the Ministries of Education and Environmental Protection, Israel Nature and Parks Authority, the Technion, the Society for the Protection of Nature and the "Green Net". By the year 2009, 250 schools were acknowledged as "Green Schools". The characteristics of this program are:

- **Dominant Trends in Environmental education**

Education for Sustainable Development, Sustainability Education

- **Program Objectives**
  - Establishing a curriculum in the subject of the quality of the environment for at least two grades and for a minimum time frame of 30 hours per year.
  - Cooperation with school community - The existence of a community environmental project carried out by at least one grade (in addition to the former two grades).
  - Rationalized use of resources - Carrying out an environmental survey and implementation of a plan to reduce the use of resources.
- **Educational Values**

The program is aimed at promoting awareness to resource consumption and changing the student's behavioral norms in order to protect the environment. Furthermore, it strives to apply citizenry capabilities that contribute to the environment. The student will act as an active citizen in its community that is aware of his rights, quality of life, and the quality of the environment.

- **Program Strategy**

The "Green School" Project is an acknowledgment program managed by a steering committee. The school management with the cooperation of the student council and school's parents decide on their commitment to the program**.** School becomes a focus for communal activity. The school recruits the public by promoting awareness to environmental issues.

- **Strategy Implementation**

The Ministry of Environmental Protection is involved throughout the acknowledgement process in the formation of the environmental curriculum; the professional assistance regarding the rationalized use of resources and in the assistance of identifying and locating the communal project carried out by the school students. Every school sets up a "Green

Council" composed of representatives of students, teachers and parents. This council is responsible along with the school management to initiate, plan, monitor and assess the environmental initiatives. The Ministry provides coordinators that assist schools through consultation, teacher training, publicity materials and one day lectures. In the annual National Acknowledgement Ceremony, dozens of schools are exposed to a nationwide activity and interconnections among schools are made.

2.9.2 The "Diligent Green School" Program

This program is a follow up program intended for schools that were acknowledged as "Green Schools" and wish to deepen their engagement with EE issues. The schools are required to meet the criterions for the "Green School" program for a period of two years. In addition they should expand the curriculum in the subject of the quality of the environment to all school grades and present a continuous reduction for all resources consumption. By the year 2009, 2 schools were acknowledged as "Diligent Green Schools".

3. Methodology

3.1 The Research Method – Case Study, Mixed Methods Approach

This study adopted a mixed methods approach and was conducted as a case study, which entails the detailed analysis of several cases (Bryman, 2008). By combing both qualitative and quantitative procedures this study practices the concurrent triangulation strategy, in which two different methods cross – validate or corroborate findings within a single study.

3.2 The Research Population

The research population included 144 students from three different schools, with a different degree of green activities: control school – a school in which there is no special environmental program, "green" school and "diligent green" school (as defined by the Israeli Ministry of Education).

In order to minimize side-effects, the schools chosen were from the same city in the center of the country. Accordingly, the three schools were from the same sector, size and socioeconomic level.

3.3 The Research Design

The current research was conducted in two stages:

3.3.1 Stage 1: Quantitative

Research method included a close-ended questionnaire. It used a questionnaire that has been served as a national survey for the sixth and twelfth grade students in Israel (Negev et al., 2008). The questionnaire included 81 questions and was distributed to 6th graders from six classes (two from each school). The questionnaire included three parts: personal background information and environmental behavior, awareness, attitude and willingness to act and environmental and ecological knowledge and its sources.

Data Collection and Analysis

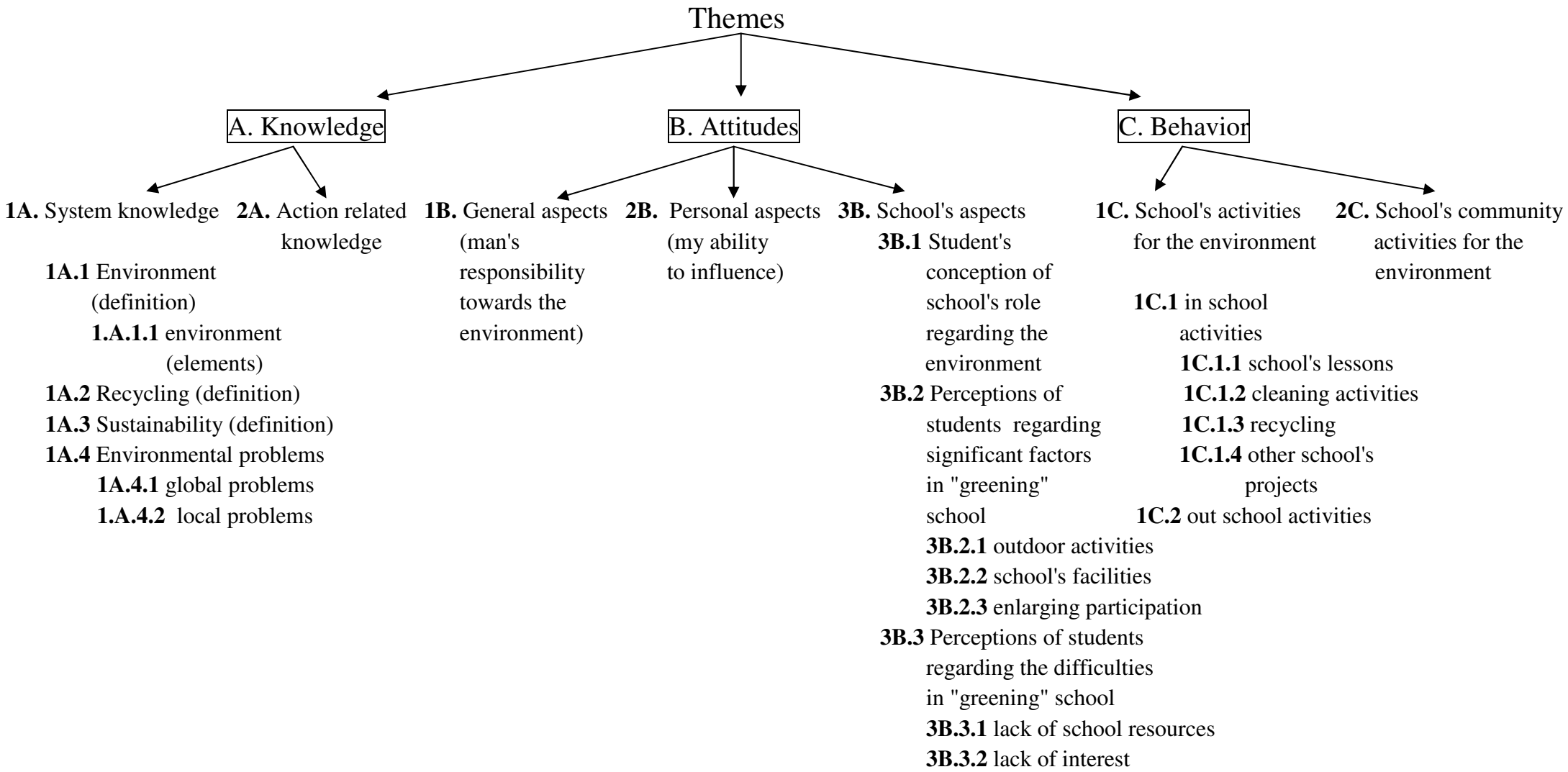
The questionnaires were passed at the second semester of the school year when the students were engaged in school activities. The questionnaires answers were typed into an Excel program. Data were analyzed by using SPSS v.17 and STATISTICA 8.0. Series of One way Analysis of Variance (ANOVA) were performed in order to find out whether type of school (control, green or diligent green) had an impact on the three dimensions (behavior, attitudes and knowledge)

3.3.2 Stage 2: Qualitative

Research method included semi-structured interviews. 24 students (8 students from each school) were interviewed at the second semester of the school year. The interviews followed an interview guide which included 13 questions. The questions were designed to elicit more information about the students' perception regarding environmental issues. In order to avoid bias in terms of gender, which was not one of this study's concerns, the same number of girls and boys were interviewed. In addition, the students were sampled randomly; each student had an equal probability of inclusion in the sample. In this way the resulting sample will be distributed in the same way as the population and will allow generalization.

Data Collection and Analysis

The interviews were held almost month after the questionnaires were passed. The students' interviews were written as transcripts which were later analyzed. The qualitative data analysis followed the grounded theory whereby data is broken down into component parts, which are given names. In this way, the researcher gives a code to the emerging data. The following scheme presents the study's themes and categories which were determined according to the students' answers in the interviews.


Themes
A. Knowledge
B. Attitudes
C. Behavior
1A. System knowledge
2A. Action related knowledge
1B. General aspects (man's responsibility towards the environment)
2B. Personal aspects (my ability to influence)
3B. School's aspects
1C. School's activities for the environment
2C. School's community activities for the environment
1A.1 Environment (definition)
1.A.1.1 environment (elements)
1A.2 Recycling (definition)
1A.3 Sustainability (definition)
1A.4 Environmental problems
1A.4.1 global problems
1.A.4.2 local problems
3B.1 Student's conception of school's role regarding the environment
3B.2 Perceptions of students regarding significant factors in "greening" school
3B.2.1 outdoor activities
3B.2.2 school's facilities
3B.2.3 enlarging participation
3B.3 Perceptions of students regarding the difficulties in "greening" school
3B.3.1 lack of school resources
3B.3.2 lack of interest
1C.1 in school activities
1C.1.1 school's lessons
1C.1.2 cleaning activities
1C.1.3 recycling
1C.1.4 other school's projects
1C.2 out school activities

4. Main Findings

The study purpose was to explore three dimensions of environmental literacy: knowledge, attitudes and behavior in each school and accordingly, characterize the unique effect of green educational programs. The current chapter highlights the study's main findings.

The present study found the effect of type of school on the behavior dimension. Students from green and diligent green school had higher scores compared to control school students.

Inter-correlations between the environmental dimensions indicated positive correlation between behavior and attitudes and attitudes and knowledge.

Both quantitative and qualitative tools indicated various differences between control school students and green and diligent green school students. However, there was almost no difference regarding knowledge, attitudes and behavior between green and diligent green school students (Table 10).

Dimension	Type of school	N	M	SD	Min	Max	F	*p*
Behavior	Control	44	2.79	0.77	1.40	4.30	2.57	.081
	Green	33	3.13	0.50	2.10	4.00		
	Diligent Green	69	2.91	0.61	1.70	4.10		
	Total	146	2.92	0.65	1.40	4.30		
Attitudes	Control	44	4.72	0.56	3.00	5.67	1.36	.260
	Green	33	4.91	0.44	3.76	5.72		
	Diligent Green	68	4.84	0.55	3.22	5.67		
	Total	145	4.82	0.53	3.00	5.72		
Knowledge	Control	44	57.25	14.11	21.00	84.00	1.39	.263
	Green	33	57.36	14.31	26.00	84.00		
	Diligent Green	67	53.27	15.23	16.00	84.00		
	Total	144	55.42	14.73	16.00	84.00		

Table 10. Means, standard deviations, minimum & maximum values, F ratios and *p* values for differences between type of school regarding behavior, attitudes and knowledge dimensions

4.1 The Knowledge Dimension

No significant differences were found among three school types regarding system knowledge (the understanding of ecological systems and environmental issues) all school types students were able to define and explain key terms in the environmental subject.

When it comes to action related knowledge, meaning the understanding how to operate in order to deal with environmental problems, green and diligent green school students presented a larger variety of creative ways to cope with both global and local environmental problems.

Identifying global – green environmental problems, control school students mentioned only limited range of problems, mainly throwing litter and air pollution. Green and diligent green school students pointed at larger range of environmental problems such as: water shortage, ozone hole, water, air and noise pollution, radiation, animal's extinction, shortage of natural resources and fires.

Indentifying local environmental problem (e.g. in my neighborhood) reflected a similar result. Control school students' major concern was throwing litter, while green and diligent green school students related to several more problems such as damage to animals habitat, lack of green spaces, lack of recycling awareness etc.

4.2 The Attitudes Dimension

Overall, students' attitudes and awareness level towards the environment, from all school types were positive. Students acknowledge man's responsibility towards the environment and identify with pro-environmental values.

Apparently, school had contributed the most to students' environmental knowledge compared to other sources of environmental knowledge (Fig. 16).

Nevertheless, Green and diligent green school students found school as the main source of information on the environment, compared with control school students who significantly reported that school contributed least to their environmental knowledge. This finding marks school as a meaningful place for green and diligent green school students.

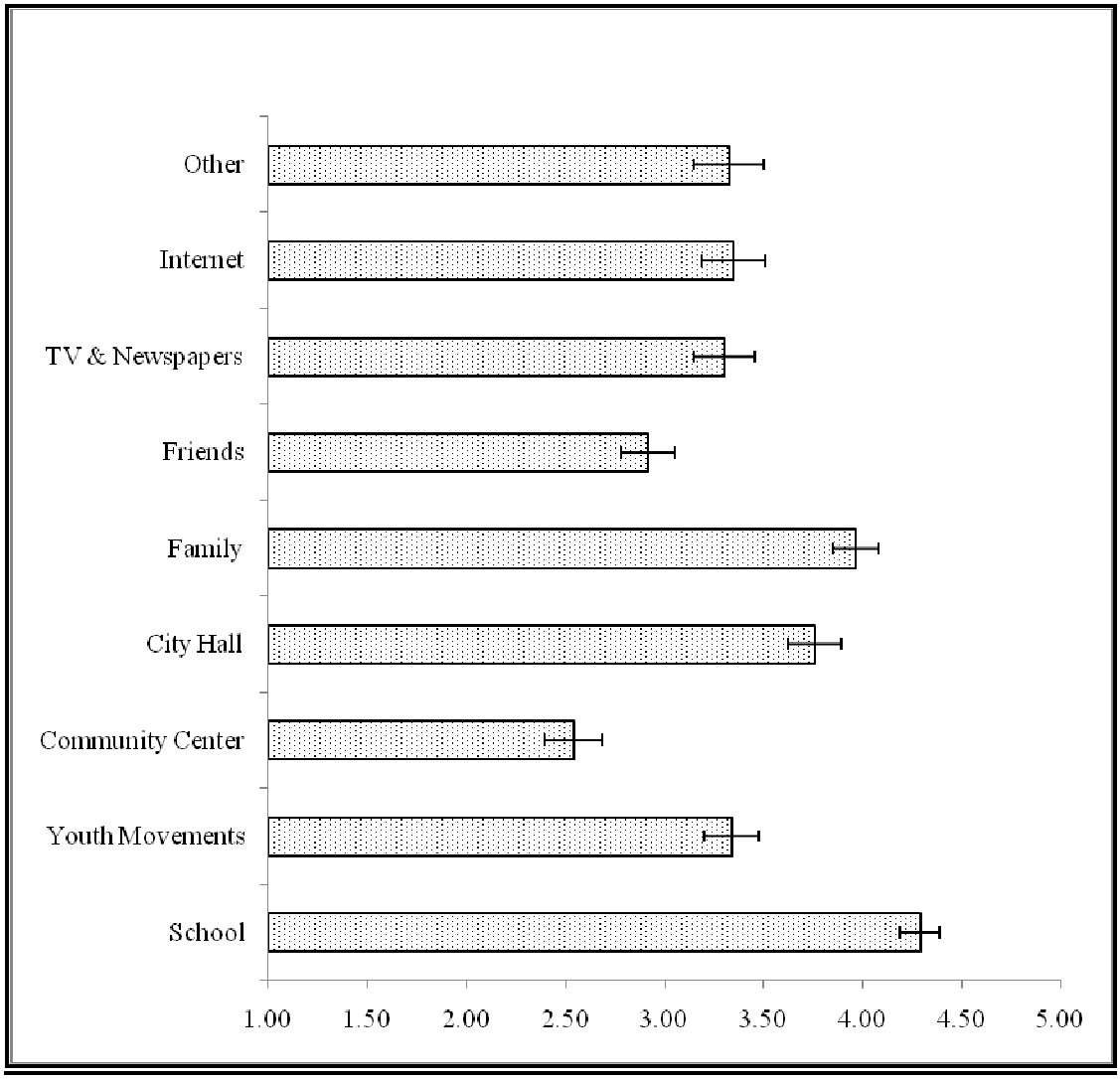


Fig. 16. The total mean score for each information source contributing to environmental knowledge

Green and diligent green school students chose the teacher as the main figure with whom they enjoy studying about nature (Fig. 13). This means that they perceive the teacher as a significant mediating figure in the environmental learning process. Control school students chose guide, friends and parents as main mediating figures.

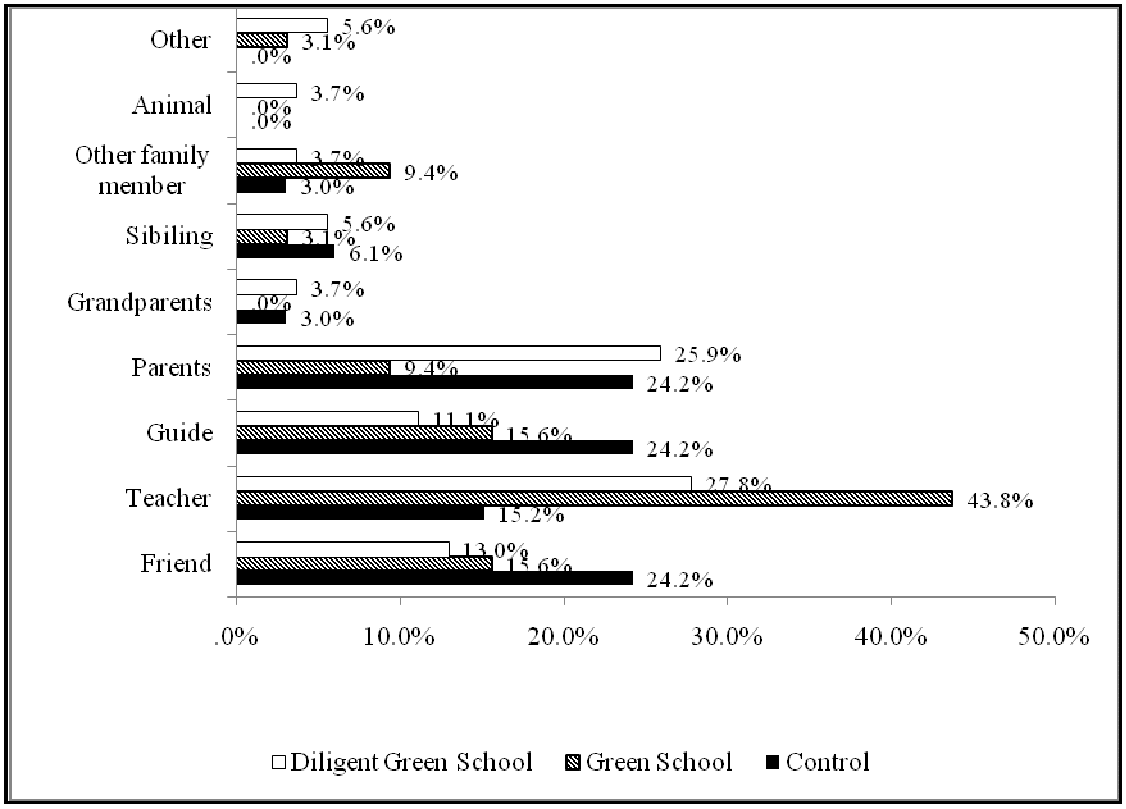


Fig. 13. Percentage of students choosing mediating figures with whom they enjoy studying about nature

Green school students scored significantly higher when asked about their frequency of talking with someone on possible activities to be done for the environment. Thus, they manifested a willingness to act for the environment.

Green and diligent green school student expressed more interest in nature and agreed more with the statement "nature interests me".

4.3 The Behavior Dimension

In terms of rationalized use of resources, students from all type of schools reported high level of recycling as a routine norm in school. Green and diligent green school students had higher scores when it comes to saving water. All types of school students encourage other to be environmentally friendly and reported telling their friends not to drop litter on the ground (when asked to comment on a possible situation). Although green and diligent green school students reported having more outdoor activities compared with control school students, there was no significant relationship between type of school and the daily hours spending outside.

This finding can be explained by the fact that green program's outdoor activities do not occur on a daily basis.

4.4 The Effect of Green Educational Programs as Perceived by the Students

Implementing ground theory approach, which studies unique phenomena from informant's viewpoint and through means of content analysis of the student's responses during their interview, the study yielded the following conclusions regarding the effect of implementing green programs on the students, the school and the community.

4.4.1 The Effect on the Students

Green and diligent green school students are more involved in pro-environmental projects than control school students. This testifies on a pro-environmental behavior.

Green and diligent green school students take active part in decision making regarding environmental issues and their implementation in school.

Participating in green school councils and initiating projects for the environment empower student's participation.

4.4.2 The Effect on School

School curriculum is of interdisciplinary nature. Environmental issues are studied in different subjects and are cooperated with school's work plan.

Outdoor activities are part of the environmental learning that take place in school surroundings (e.g. school's garden, petting zoo) or outside school.

The teacher is perceived as a role model and a major source of information and enjoyment regarding the environmental learning process.

4.4.3 The Effect on School's Community

Parents are actively involved in environmental activities and are part of the 'green council', which enables them to become true partners in the learning process.

Students contribute to the community and expose active citizenship, by volunteering in kindergarten and homes for the elderly.

Neighbors are encouraged to act for the community and cooperate with school's projects (e.g. writing a letter to the city mayor).

5. Recommendations

The conclusions of this study entail the following recommendations

5.1 Further Studies

The current research was conducted as a case study. Thus, it focused on three specific schools in one city. A further study should be carried out, exploring larger number of schools undertaking green programs.

The present study examined three schools in a specific time frame. Additional study may explore the effect of green programs by conducting a longitudinal research using pre and post assessments of these specific programs.

Since the current study didn't find any significant differences between green and diligent green schools, it might be suggested to conduct a further study in order to discover the additional aspects concerning sustainability that are emphasized in diligent green schools.

5.2 Implementing Green School Programs

Analyzing the student's answers, it is apparent that the implementation of the 'green school' program has lead to a larger pro- environmental behavior. Therefore, I believe that this program should become an integral part of school's general curriculum and not serve as a unique program of certain specific schools.

Environmental education should be taught as an interdisciplinary subject and should not be left for science teachers alone. Furthermore, outdoor activities should be incorporated in the learning process as an integral part of the curriculum.

In order to proper assimilate the environmental knowledge and values there is a need to train teachers to use different teaching strategies better suitable for teaching the subject.

In additional, new learning materials should be developed and appropriate budgets should be devoted to the environmental educational programs, allowing schools to change their facilities and create 'greener' learning surrounding.

This requires a change in school's priorities and accordingly, in the message it conveys its students.

Finally, green school programs are usually aim for specific grades (this study examined 6^{th} graders). In light of the holistic-systemic nature of the transformation of school into a 'green' school' participation of all school's students, of all ages should be implemented. Moreover, school's role as a societal agent necessitates the creation of partnerships between school and the community it serves regarding the promotion of responsible social-environmental behavior.

In this way, the 'green school' program won't be considered a unique program but rather as school's lifestyle.

Selected Bibliography

Ajzen, I., & Fishbein, M. (1980).Understanding Attitudes and Predicting Social Behavior, Englewood Cliffs, NY: Prentice Hall, Inc.

Ajzen, I., & Fishbein, M. (2000). Attitudes and the attitude-behavior relation: reasoned and automatic processes.In W. Stroebe and M. Hewstone (Eds.), European Review of Social Pshchology, Chap.2. Chichester: John Wiley& Sons.

Ashforth, B.E., & Mael, F. (1989). Social identity theory and the organization. Academy of Management Review, 14(1), 20-39.

Bryman, A. (2008). Social Research Methods. 3rd ed. UK: Oxford University Press.

Capra, F. (1997). The Web of Life, Harper Collins.

Clayton, S., & Opotow, S. (2003).Introduction: Identity and the natural environment. In: S. Clayton and S. Opotow (Eds.), Identity and the Natural Environment (pp.1-19). Cambridge, Massachusetts: The MIT Press.

Corpade, A.M. (2011). Real Environment, Perceived Environment and Human Behaviour in the Maramureş Depression. Unpublished doctoral dissertation, Babes-Bolyai University, Cluj-Napoca, Romania.

Erikson, E.H. (1950). Childhood and Society. New York: Norton.

Freire, P. (1995).Pedagogy of the Oppressed, New York: Continuum.

Gan, D., Pizmoni, A., Peled, A. (2002). Environmental Education in the Elementary School – "The Environment Protectors" Program. The Society for the Protection of Nature in Israel (SPNI).Jerusalem.

Giroux, H. (1988).Teachers as Intellectuals – Toward a Critical Pedagogy of Learning, Massachusetts: Bergin & Garvey Publishers.

Goldman, D., et al. (2003). A Policy regarding Environmental Education in Israel – an Increased Gap between Existing and Desired Situation- A paper draft. Presented by the National Council for the Quality of the Environment, The Committee for Education and Community.

Goldman, D., Yavetz, B., & Pe'er, S. (2006). Environmental literacy in teacher training in Israel: environmental behavior of new students. The Journal of Environmental Education, 38(1), 3-22.

Gruenewald, D.A. (2003). The best of both worlds: A critical pedagogy of place. Educational Researcher, 32(4), 3-12.

Hart, R.A. (1992). Children's participation: from tokenism to citizenship, Innocent Essays (4). UNICEF: United Children's Fund.

Hauge, A.L., (2007). Identity and place: A critical comparison of three identity theories. Architectural Science Review, 50 (1), 44-52.

Hines,J.M., Hungerford, H.R., & Tomera. A.N. (1986/87).Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. The Journal of Environmental Education, 18(2), 1-8.

Hungerford , H., & Volk, T. (1990). Changing learner behavior through environmental education. The Journal of Environmental Education, 21(3), 8-20.

Ibarra, J., Gil Quilez, M.J., Carrasquer, J. (2009). Environmental issues and ecological understanding in teachers training, In: N. Szállassy (Ed.), Acta Didactica Napocensia , Vol. 2(2) (pp. 65-72). Cluj-Napoca: Babes-Bolyai University.

Kaiser, F., Wolfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. Journal of Environmental Psychology, 19, 1–19.

Kals, E., & Ittner, H. (2003). Children's environmental identity: Indicators and behavioral impacts. In: S. Clayton and S. Opotow (Eds.), Identity and the Natural Environment (pp. 135-157). Cambridge, Massachusetts: The MIT Press.

Kollmuss, A. & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 239-260.

Lasonen, J. (2009).Intercultural education: promoting sustainability in education and training. In: J. Fien et al. (Eds.), Work, Learning and Sustainable Development, chap.14. Springer.

Leeming, F.C., Dwyer, W.O., & Bracken, B.A. (1995). Children's environmental attitude and knowledge scale: construction and validation. The Journal of Environmental Education, 26(3), 22-31.

Mac, I. (2003). Stiinta Mediului [Environmental Sciences]. Editura Europontic, Cluj-Napoca.

Mac, I. (2008). Geografie Normative [Normative Geography]. Editura Presa Universitara Clujeana, Cluj-Napoca.

Maslow, A.H. (1964). Religions, Values and Peak Experiences, Ohio State University Press, Colunbia, Ohio, p. 97.

McLaren, P. (2005). Capitalists and Conquerors, Lanham MD: Rowman & Littlefield.

Mogensen, F. (1997). Critical thinking – a central element in developing action competence in health and environmental education. Health Education Research Journal: Theory and Practice, 12(4), 429-436.

Morrone,M., Manci, K.,& Carr,K. (2001). Development of a metric to test group differences in ecological knowledge as one component of environmental literacy. The Journal of Environmental Education, 32(4), 33-42.

Negev, M., Sagy, G., Garb, Y.,Salzberg, A.,& Tal, A. (2008).Evaluating the environmental literacy of Israeli elementary and high school students. The Journal of Environmental Education, 39 (2), 3-20.

Orenstein, D.E. (2004). Population growth and environmental impact: Ideology and academic discourse in Israel. Population and Environment, 26(1), 41-60.

Prochaska, J. O., & Di Clemente, C. C. (1986). Towards a comprehensive model of change. In: W.R. Miller and N. Heather (Eds.), Treating Addictive Behaviors: Processes of Change. New York: Plenum Press.

Proshansky, H. M. (1978). The self and the city. Environment and Behavior, 10(2), 147-169.

Proshansky, H. M., & Fabian, A.K. (1987).The development of place identity in the child. In: C.S. Weinstein and T.G. David (Eds.), Spaces for Children, the Built Environment and Child Development (pp. 21-40).New York: Plenum Press.

Reithmeier, H., & Sabo, H.M. (2010). New guidelines for environmental education in curriculum schools in Bavaria, opportunities for exciting, real-life lessons. Educaţia 21, 8, pp. 162-168, Casa Cărţii de Ştiinţă, Cluj-Napoca.

Rokeach, M. (1973). The Nature of Human Values, New York: Free Press.

Rokeach, M. (1976). Beliefs, Attitudes and Values: A Theory of Organization and Change, Jossey-Bass Publishing, San Francisco, CA., p.92.

Roth, C.E. (1992). Environmental literacy: Its roots, evolution, and directions in the 1990s. Columbus, OH: ERIC/CSMEE. Roth, C. E. (1968). On the Road to Conservation. Massachusetts Audubon, June 1968, pp. 38-41.

Sabo, H.M. (2011). Environmental education and sustainable development- general aspects. International Conference on Social Science and Humanities (ICSSH) IPEDR vol.5 (2011), IACSIT Press, Singapore. http://www.ipedr.net/vol5/no2/2-H10061.pdf , accessed in 1.11.2011 at 14:00.

Schwartz, S. H. (1973). Normative explanations of helping behavior: A critique, proposal, and empirical test. Journal of Experimental Social Psychology, 9, 349-364.

Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, Vol. 10(pp. 221-279). New York: Academic Press.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), Advances in Experimental Social Psychology, Vol. 25 (pp. 1-65). Orlando, FL: Academic Press.

Shallcross, T. (2003). Education as Second Nature: Deep Ecology and School Development Through Whole Institution Approaches to Sustainability Education, Unpublished doctoral thesis. Manchester Metropolitan University, Manchester, UK.

Simmons, D. (1998). Education reform, setting standards, and environmental education. In H. Hungerford, W. Bluhm, T.Volk, & J. Ramsey (Eds.), Essential Readings in Environmental Education,(pp. 65-72). Champaign, IL: Stipes.

Stapp, W.B. et al. (1969). The concept of environmental education. The Journal of Environmental Education, 1 (1), 30-31.

The "Green School" Program http://www.sviva.gov.il/bin/en.jsp?enPage=BlankPage&enDisplay=view&enDispWhat=Zone&enDispWho=greenschools&enZone=greenschools accessed in 12.1.2010 at 14:00.

Thomashow, M. (1996). Ecological Identity: Becoming a Reflective Environmentalist. The MIT Press.

UNCED (1992). Promoting Education, Public Awareness and Training, in Agenda 21. Geneva: UN. pp. 221-227.

UNESCO (1976). The Belgrade Charter: A global framework for environmental education. Connect, I (1). Paris: UNESCO-UNEP.

UNESCO (1977). Intergovernmental Conference on Environmental Education: Final Report. Tbilisi, USSR 14-26 October 1977. Paris: UNESCO-UNEP.

UNESCO (1985). A guide on environmental values education. Environmental Education Series, 13. UNESCO-UNEP International Environmental Education Programme (IEEP).

UNESCO (2005). Working Paper: Asia-Pacific Regional Strategy for Education for Sustainable Development – UN Decade of Education for Sustainable Development (2005-2014). Bangkok: UNESCO Bangkok.

WCED (1987). The World Commission on Environmental and Development: Our Common Future. Oxford: Oxford University.