

MOLDOVA STATE UNIVERSITY

Presented as manuscript:
U.C.D.: 373.3.015(569.4)(043.2)

RANIA SHALASH

**THEORETICAL AND METHODOLOGICAL
APPROACHES OF ENVIRONMENTAL
EDUCATION WITHIN PRIMARY SCHOOLS IN
THE ISRAELI ARAB SECTOR**

Speciality 531.01 – General theory of education
Doctoral thesis abstract in pedagogy

CHISINAU, 2017

**The doctoral thesis was elaborated in the Department of Educational Sciences,
Moldova State University**

Scientific adviser:

GORAS-POSTICA Viorica, Habilitated Doctor, University Professor

Official referents:

1. CUZNETOV Larisa, Habilitated Doctor, University Professor
2. PANICO Vasile, PhD, Associated Professor

Composition of the specialized Scientific Council:

1. GUȚU Vladimir, president, Habilitated Doctor, University Professor
2. ȘEVCIUC Maia, scientific secretary, PhD, Associated Professor
3. SILISTRARU Nicolae, Habilitated Doctor, University Professor
4. DEDIU Ion, Habilitated Doctor, University Professor, correspondent member of Science Academy of Moldova
5. BIRNAZ Nina, PhD, Associated Professor
6. SARANCIUC–GORDEA Liliana, PhD, Associated Professor
7. COZARI Tudor, Habilitated Doctor, University Professor
8. SOCHIRCA Vitalie, PhD, Associated Professor

The Doctoral thesis defense will take place on February **10th 2017, at 14.00**, in the meeting of the Specialized Scientific Council within Moldova State University, 60 A, Mateevici street, Chisinau, Republic of Moldova.

The Doctoral thesis and the abstract can be found in the Scientific Library of Moldova State University and on the website of C.N.A.A. (www.cnaa.md).

The abstract was sent on January 10th.

Scientific secretary of the Specialized Scientific Council,

ȘEVCIUC Maia, Associated Professor, PhD _____

Scientific supervisor/advisor,

GORAȘ-POSTICĂ Viorica, habilitated doctor, Associated Professor _____

Author:

SHALASH Rania _____

CONCEPTUAL HIGHLIGHTS OF THE RESEARCH

The actuality of the research. Bringing up students to high levels of Environmental Literacy (EL) is not an easy task that depends on several factors in the society, and the most important factor is the implementation of Environmental Education (EE) in the educational institutions. In recent years the Ministry of Education of Israel, in collaboration with the Ministry of the Environmental protection, has intensified its interest in the integration of EE in schools, especially in primary schools, in order to create students with high levels of EL, through activating EE programs for students, within the school premises and outdoors. In order to succeed in these programs, teachers who have strong and persistent connection with the students, must be knowledgeable in this area and must be provided with skills and techniques in order to implement EE in their areas of specialization and in order to pass it to their students properly. This can be done through training courses, designed especially for teachers, that require the engagement of the complete teaching staff at the school, apart from the science teachers who are naturally highly connected to the subject of environment. In addition, understanding and analyzing teachers' perceptions regarding the environmental programs will urge them to interact more with the environmental issues as well. Therefore, EE programs will gain more successes at schools and will certainly lead to the elevation of the students' EL level and thus to the achievement of the main goal of EE.

Description of the situation in the science field and identification of the research problems. The concept "Environmental Education", probably first appeared in the United States of America in the late 60's of the last century when Stapp et al. stated that the aim of EE is to create people with knowledge concerning to bio-physical environment and its problems and have the motivation to work toward their solution [34]. According to the charter produced in Belgrad Workshop in 1975, the general goal of EE was to develop people that are aware of, concerned about, the environment and its associated problems, and which has knowledge, skills, attitudes, motivations and commitment to work individually, and collectively toward solutions of current problems and prevention of new ones [39]. According to the Intergovernmental Conference on EE held in Tbilisi in 1977, the basic aim of EE is to succeed in making individuals and communalities understand the complex nature of the natural and built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of quality of the environment [38]. The definition of EE done by Stapp et al., the Belgrade Charter and Tbilisi Declaration were the early attempts to develop the area EE. According to all the definitions of EE mentioned above, the fundamental aim of

EE is to develop environmentally literate people who have responsible environmental behaviors [11]. There is consensus among researchers that EL is an outcome of EE programs and initiatives [16] and a fundamental goal of EE [5]. In 2006, Goldman, Yavetz and Pe'er [7] identified environmentally literate person as a person who possesses the values, attitudes and skills that enable knowledge to be converted into action. The EL Assessment Consortium consisting of EE scholars designed EL framework based upon historical definitions, research and evaluation literature, and learning outcomes in EE [25]. The framework of EL includes: (1) **Cognitive dimensions**, (2) **Affective dimensions**, (3) **Additional determinants of environmentally responsible behavior**, and (4) **Personal and group involvement in environmentally responsible behavior**. All of the above provides evidences that EL includes four main categories; (1) knowledge, (2) Affect, (3) Skill, and (4) Behavior [9].

It was important for our information and for the exchange of experience regarding this research that, in the Republic of Moldova, the Concept of Environmental Policy of the country is adopted since 2001, which expresses commitment to ensure public access to the information in the field, including a more active training regarding decision making towards the environment and natural resources, in education and ecological training [46]. In 2014, was adopted a crucial regulatory document, The Environment Strategy for 2014-2023 [47]. In 2008, first Curriculum for the ecological education was elaborated, and in 2015 it was updated and recommended by the National Council for Curriculum at the optional discipline of ecological education for the I-XII grades, being provided with didactic support [45]. I have known about new essential contributions to the research and to the improvement of practice of environmental education and environment protection in Moldova of the environmental scientist I. Dediu, through the Encyclopedia of Ecology, and through the valuable materials from the Red Book of the Republic of Moldova [48]. We also investigated the contribution of T. Cozari scientist, specialist in biodiversity, ecology and ethology of plants and animals, including author of the first wildlife atlas made by a Moldovan [49]. Through outstanding contributions to environmental education in Moldova stands following reference names: L. Saranciuc-Gordea [50], N. Birnaz [51] V. Sochircă [52] etc. As support for pedagogical theory and general axiology, I used data from his experience Vl. Gutu [53], the Larisa Cuznețov [52], Goraș-Postca V. [54] of N. Silistraru, of M. Shevkihuk, V. Panico etc.

The Ministry of Education in Israel has called for the prioritization of EE programs in schools. Many efforts have been put into the development of EE programs in the educational system in Israel. EE programs, such as the “Green school” program (on behalf of the Ministry for Environmental Protection), gained tremendous recognition and are continually being introduced to schools in Israel in order to assist students in developing EL and to become environ-

mentally responsible citizens. Several schools have adopted these programs because of their effectiveness for improving the students' learning, their EL and the school's physical environment. However, on one hand, the effectiveness of these programs and the students' EL level have not been examined enough and there are limited studies concerning the students' EE achievements in primary schools especially in the Arab sector. This makes it difficult to state the degree of impact of EE programs on students' EL. On the other hand, the situation of training teachers for integrating EE in Israel reflects, to a large extent, the situation of the EE in the school system [6]. The striking feature in this topic is the lack of properly trained teachers for the integration of environmental studies and EE as an interdisciplinary perception. Integrating EE in primary schools is done in a limited extent, especially by science teachers. Teachers are not trained enough to deal with the challenges of the EE as an interdisciplinary profession that combines social and ethical aspects with scientific knowledge and skills and that strives to shape behavior [6]. The premises and contradictions mentioned above, have led to the formulation of the **research problem**: The effectiveness of EE programs, which were designed to raise the EL level of the students, and teachers' environmental perceptions, have not been examined enough, especially in primary schools of the Arab sector, because this situation affects a lot a situation of environment and sustainable development.

The research goal is to analyze the theoretical framework of the EE programs impact on ecological literacy of students and the environmental perceptions of students and teachers and to develop the methodology integration of EE in the curriculum at the primary level in the Israel's Arab sector.

The research objectives are:

1. To analyse the theoretical aspects of EE through extrapolate from the current EL of students in sixth grade in primary schools in the Arab sector, in general;
2. To identify the EE methodological items by comparing the link between EL components (knowledge, attitudes, behaviors and skills);
3. To evaluate the impact of the contextual training factors (source of knowledge, sex, education level and occupation of parents, time spent outdoor) on EL of students in sixth grade;
4. To develop an intervention program in order to prepare teachers to integrate EE into their study plan to improve the EL of students in sixth grade;
5. To determin the impact of the intervention program on EL of students from the sixth grade and on environmental perceptions of teachers and students involved in the process.

Scientific novelty and originality of the research: Using ecocentric, antopocentric and sustainable environmental development approaches in the elaborated methodology of integration of EE in primary education in the Arab

sector of Israel, focused on knowledge, strengthening perceptions and responsibility, boosting involvement, actions and practical applications. Elaborating the methodology which will contribute to improve student's EL focused on turning complex conceptual theoretical precepts, priority policy and international environmental science.

The important scientific problem solved in the research was to analyze the theoretical and methodological aspects of the impact of the ecological literacy programs on the students from the sixth grade in the Arab sector from Israel and ecological perceptions of students and teachers about them in terms of harnessing the intervention program for teacher training in environmental education field in order to streamlining sustainable approach of the environmental behavior.

Practical value of the research: The research results can be used to implementate the EE programs in formal and informal context, in order to support the educational institutions, especially those in the Arab sector, to create and implement programs working models and teaching methods in environmental programs. The research conducted to considerable practical contributions on teachers training in EE. The recommendations will influence educational leaders and decision-makers and will contribute to promoting quality EE in primary schools of the Arabic sector. They will also influence the promotion of education for sustainable development through training programs, through involvement and adequate environmental behavior. Education for sustainable development is important for creating a citizenship responsible behavior and civic values worthy for present and future.

Research methodology includes: *theoretical methods:* scientific documentation; comparative analysis; and generalization; *empirical methods:* quantitative and qualitative method, focus groups interviews, formative experiment which included specific stages: findings,

Research instruments: questionnaire to measure the students' EL level; Group interviews (Focus Groups) with students and personal interviews with teachers to identify their environmental perceptions and perceptions regarding the EE programs.

The main scientific findings of the research:

1. Analysis of data revealed that the general level of EL (in all its dimensions: knowledge, attitudes, affect, behavior and skills) of all students in all types of schools (green schools and non-green schools) is inadequate (below average). The students' level of EL in green schools was higher than in non-green schools at the beginning and at the end of the school year. The students' level of EL has increased, at the end of the school year, in all types of schools.
2. Analysis of the data revealed a weak correlation between knowledge and

the rest of the EL dimensions and a weak correlation between attitudes and affect, between attitudes and behavior and between affect and behavior.

3. Analysis of the data revealed that the connections limited (a limited connection was found between each of the background variables and the EL).
4. The intervention program is actually a training course designed especially for teachers in order to train and qualify them to integrate environmental education in their teaching professions and aim to increase the students' level of EL.
5. The intervention program significantly improved the EL level, of the students involved, in all the its dimensions. The intervention program has also positively affected the environmental perceptions and perceptions concerning environmental programs of the students and the teachers.

Implementation of the scientific results was achieved on basis of experimental investigations of governmental primary schools of the Arab sector related to the educational system, through scientific publications, and through practical activities with students, teachers and academics.

Approval of research results: The fundamental tenets and the conclusions were reflected in scientific articles and papers delivered at national and international magazines and international scientific conferences: the International Scientific Conference: *Postmodern Education between efficiency and functionality*, State University of Moldova, Faculty of Psychology and Educational Sciences, Center of Research in Educational, Social and Humanitarian Sciences, Chişinău, 2013; the International Scientific Conference: *University education and labor market: connections and perspectives*, Moldova State University, Faculty of Psychology and Educational Sciences, Social and Economic Science Research Center, Chişinău, 2014; *Didactica Pro...*, Magazine of Educational Theory and Practice, Chişinău, Dec, 2013; State University of Moldova, Scientific journal, Chişinău, October 2013, October 2014, May 2015; Official Site of Carmel College-Israel, August 2015.

Publications on the topic of doctoral thesis: The thesis topic was elaborated and published through 7 scientific papers: 5 scientific articles were published in journals of national and international journals and 2 scientific articles were published in international conferences.

Volume and structure of doctoral thesis: The thesis contains annotations (in Romanian, English and Russian) introduction, three chapters, conclusions and recommendations, bibliography (204 sources), 7 appendices, 156 basic text pages, 35 tables, 15 figures.

Keywords: Environmental Education, Environmental Literacy, Sustainability, Sustainable Development, Education for Sustainable Development, Environmental Programs, Green School Program, Environmental Perceptions.

DOCTORAL THESIS CONTENT

The **Introduction** presents and discusses the actuality and the importance of the research topic, describes the research domain and highlights the research problem. Further it presents the main goal and objectives of the research, scientific novelty and originality of the research, theoretical significance and practical value of the research, scientific approval of the results, summary of the thesis parts and the experimental data that confirmed the research hypothesis.

Chapter 1 entitled „**Theoretical background of Environmental Education, approaches in Environmental Education and Environmental Literacy**” includes, in its first part, summary of the development of EE in the world and in Israel. It focuses on the beginning of using the term EE and on the attempts to define the term EE. It also includes the world events in the history of EE since 1870 up till today. Later, this part focuses on the definition, conceptualizing and framework of EE. Different approaches in EE were been touched in the second part of this chapter, in order to formulate a worldview in EE. It intensely focuses also on the importance of clarifying perceptions of students and teachers involved in EE. Also, it includes a review of the most important researches that examined the perceptions of those involved in EE. The third part of the chapter includes different definitions of the term EL, the process of forming a framework of EL, the development of EL components and a review of the researches that were conducted around the world evaluating EL or some of its components.

Summary of the first chapter: Stapp and his colleagues, who identified the term EE for the first time, believed that the major objects of EE are to encourage the people to acquire: (1) the understanding that man is part of a system and that he has the ability to change the interrelationship of this system, (2) the understanding of the biophysical environmental and its role in contemporary society, (3) the understanding of the biophysical environmental problems confronting man and how can these problems be solved and (4) the attitudes of concern for quality of the biophysical environment which will motivate citizens to solve problems concerning biophysical environment [34]. Environmental Education, even then, created the necessary connection between the deterioration of the environment situation in the twentieth century and the education for environmental responsibility. In 1975, the International Workshop on Environmental Education, held in Belgrade, produced a tentative framework for EE. The objectives of EE, stated within this tentative framework, were based upon awareness, knowledge, attitudes, skills, evaluation ability and participation [39]. In 1977, in the first Intergovernmental Conference on EE held in Tbilisi in Georgia, the concept EE was detailed more precisely. The participants of the conference identified the aims, goals and objectives of EE. The main goal of the EE as stated in the conference were: (1) to increase awareness and interest in economic,

social, political and ecological matters in the urban and rural areas; (2) to give people the opportunities to acquire the knowledge, values, attitudes, commitment and skills in order to protect the environment; and (3) to help individuals, groups and society as a whole to behave differently towards the environment [38]. According to all definitions done so far regarding the term EE, the fundamental aim of EE is to create environmentally literate people.

There are different approaches in EE and in all of them there is a concern for the environment and a recognition that education has a major role in tending the environment. The recognition of the different approaches does not necessarily require the adoption of only one of them and rejecting the others. The comparison between the approaches enables the use of consistent terminology and avoids the adoption of contradictory approaches [27]. Different approaches of EE relate mostly to learning processes, the learner's status in the process and how meaningful learning occurs in the process. The Education for Sustainability (EFS) approach is discussed extensively in the literature over the last decade. Today, the programs that focus on EFS and that highlight the activism as a central value are increasing in the education system.

Different people refer to the environment from different observation angles that are affected from cultural and social norms and values, from social class and from geographical location [8]. It is very important to clarify the perceptions of those involved in EE from several assumptions: the ways in which people experience the environment and understand it, affect their environmental behavior and thus it is very important to decipher these understandings [14]. Examining and analyzing perceptions contributes to the development of environmental programs and teaching methods. Perceptions are a key to realize EE in the educational system.

In most of the researches that aimed to examine the environmental perceptions of students and teachers, three main approaches were identified in their answers to the questions about how they perceive the concept "environment" and other environmental concepts: the ecocentric approach; the anthropocentric approach and the sustainability approach. According to the ecocentric approach, humanity is inseparable from the environment. The environment has its own value, regardless the human needs. Humans are not considered as supreme organisms or separate from the ecosystem, but they are part of the harmony and balance in the human-environment interactions. This harmony is necessary for continued existence of human beings and the environment alike. In other words it is about valuing nature for its own sake. According to the anthropocentric approach the environment is important for human health and quality of life. In other word it is about valuing nature because of material or physical benefits it can provide for humans. According to the sustainability approach, preserving the environment is actually for the future generations and for the continuity of the earth. In other words sustainable development is development that meets the

needs of the present without compromising the needs of future generations to meet their own needs.

The term EL is an outcome of EE programs and initiatives [16] and a fundamental goal of EE [5]. The EL Assessment Consortium consisting of EE scholars designed EL framework based upon historical definitions, research and evaluation literature, and learning outcomes in EE [25]. The framework of EL includes: Cognitive dimensions; Affective dimensions; Additional determinants of environmentally responsible behavior; and personal and group involvement in environmentally responsible behavior. All of the above provides evidences that EL includes four main categories; (1) knowledge, (2) Affect, (3) Skill, and (4) Behavior [9]. Later, broader evolving lists of EL components have been developed. Each of these framework assume that EL includes at least five groups of learning outcomes within several learning domains: cognitive, affective and psychomotor or conative.

In the past twenty years studies have been conducted around the world evaluating EL or some of its components [20]. These studies were classified into four categories: (1) studies assessing the effectiveness of EE programs for fostering EL or assessment of EL as an outcome of EE programs and initiatives [41]. (2) Studies assessing EL or establish EL baseline of students or teachers [16]. (3) Studies determining the relationship between EL components as predictors of responsible environmental behavior – REB [10]. (4) Studies assessing EL in order to develop or test the validity, reliability and usability of an instrument for measuring EL [19]. Such studies have been conducted for target groups at national level and in addition to these studies regional studies were conducted in many countries around the world but it was very clear that there is no updated or comprehensive report regarding the EL amongst Arab students in Israel.

In summary, EL is an outcome of EE programs and initiatives and a fundamental goal of EE. The EL level of Israeli Arab students in primary schools was not examined enough. There are different approaches in EE. Different people refer to the environment from different observation angles. It is very important to clarify perceptions of those involved in EE. Examining and analyzing perceptions contributes to the integration of EE at schools and to the raising of the students' EL level.

Chapter 2 entitled „**Methodology of Environmental education in Israel – educational programs in the context of the Arab society**” focuses, in its first part, on the development of environmental education in the country and its integrating in the education system, clarifying regarding the situation of the country compared to the world concerning environmental education, displaying different points of view of several researchers on how to integrate environmental education in the education system, the government's decision and the CEO circular of the Ministry of Education which were published especially for the environmental education topic, the difficulties that are faced while designing environmentally involved students, a review of the studies that aimed to examine

the impact of environmental education programs on students, the development of the environmental sciences subject in schools at all stages from elementary to secondary, the importance of training the involved teachers to teach about environment and the teaching subjects that emphasize environmental education in the education system. The second part focuses on the leading EE programs running across the country, the elements of effective EE programs, the importance of evaluating EE programs for the improvement of the programs and for insuring their effectiveness, types of evaluation (focusing on the outcome-based evaluation) and the difficulties in the evaluation of the EE programs. The third part focuses on the relation between the Arab society and the environment and the presence of environmental aspects in their lifestyle and religion; considering the Arab community as a community of low environmental literacy due to the negligence by the citizens in general and by the local authorities and the country in particular; the problem of not or lack of exposing Arab schools to the issue of the environment; comparisons between Arab students and Jews concerning the environment; the problem of lack of adequate amount of educational materials pertaining to environment in the Arabic language and the problem of lack of adequate support by the parents of the students and the authorities in the schools.

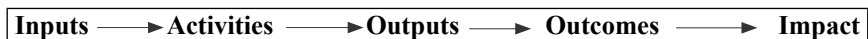
Summary of the second chapter: The EE in Israel is based on the government decision from May 14, 2003 [42] regarding a strategic plan for SD in Israel. Since this decision, the Ministry of Education in Israel has called for the prioritization of EE programs in schools. As mentioned above, the goal of EE is to instill in learner's knowledge about the environment, positive attitudes toward the environment, competency in citizen action skills, and a sense of empowerment. In order to reach this goal, EE programs must be effective. According to Athman and Monroe [1]: Effective environmental education programs involve stakeholders in all stages of the program, from the development of the program to its evaluation; Effective EE programs empower learners with skills to help prevent and address environmental issues and with a sense of personal and civic responsibility; Effective EE programs are accurate and balanced, incorporating multiple perspectives and interdisciplinary aspects; Effective EE programs are also instructionally sound, using "best practices" in education. And finally, effective EE programs are evaluated with appropriate tools.

One of the leading programs running across the country is the "Green School" program. The Ministry for the Protection of Nature in collaboration with the Ministry of Education are leading for more than ten years now the certification process of "Green School" [43]. The purpose of the process is to bring the principles of SD into implementation at schools [29]. The certification constitutes recognition with the significant EE taking place at school, and delineates a possible way of action for schools that want to start environmental activities based on existing frames. The model is based on the principles of learning about environment, implementation of a sustainable lifestyle in school,

and students' activity designed to bring about a change in consciousness and behavior of the community in relation to the environment. School that meets all the criteria, wins to be certificated as "Green School" [29]. This program assists students to develop EL and to become environmentally literate and responsible citizens (however the effectiveness of such programs has not been examined enough and there are limited studies on students' EE achievement in primary schools especially in the Arab sector in Israel).

Evaluation is the systematic assessment of the operation and/or the outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy. Evaluating EE programs is very critical and important for achieving its goals. If evaluation is considered as part of the EE programs, it will improve program quality and student learning and will help program to achieve its goals [37]. The Outcome-Based Evaluation is one of the most program evaluations used by non-profit organization [30]. It looks at the changes to the clients, as a result of the efforts during and after their participation in the program. The Outcome-Based Evaluation is based on a logic model that helps us understand what the project is doing and what it is changing (fig. 1). Evaluating EE programs is very important in order to improve these programs and to ensure their effectiveness. Many researchers have come to the conclusion, from them researches that certain environmental programs are not particularly effective and must be improved. In 2014, Saribas, Teksoz and Ertepinar conducted a research in Turkey that examined 61 elementary teachers' EL and self-efficacy beliefs. The findings showed that the teachers did not have sufficient environmental knowledge or self-efficacy beliefs although their environmental attitudes, concerns, and perceptions regarding environmental issues were relatively high, therefore the conclusion was that environmental programs should be improved [26].

Fig. 1 - Outcome-Based Evaluation Model



Although the main purpose of the EE is to create environmental literate students but the EE programs sometimes do not achieve the target therefore an evaluating of EL is critical in any phase in order to examine the effectiveness of the programs. In 2013, for example, Stevenson et al., conducted a research that compared EL between environmental and non-environmental middle schools in California in USA. One of the results showed that environmental schools were not associated with improved EL, but the use of published EE curricula paired with time outdoors represents a strategy that may improve all key components of student EL. Also advanced teachers' experience help to boost student EL levels. The conclusion is that EE program should be studied carefully and must take in account all components of EL [36].

Regarding the relation between the Arab society and the environment and according to Negev and colleagues [21], most schools in the Arab sector are not exposed or are exposed very little to the environment and according to Methany [18], most of the teachers in Arab schools see their educational role as information transmitters about issues relating to prevailing environmental perceptions but not as designers of environmental behaviors. The Arab society in Israel public is perceived as a public that has low environmental awareness both in his own eyes and in the eyes of the general public [32]. Therefore, if in general in Israel, there is room for improvement regarding the level of awareness, and environmental actions after all, the problem in the Arab sector is much more tangible, and lack of awareness is expressed in serious environmental problems.

In summary, the Ministry of Education has called for the prioritization of EE programs especially in primary schools. However, on the one hand, the Impact of the EE programs was not examined and evaluated enough in the Arab sector. On the other hand, the Arab society is perceived as a public that has a weak connection to the environmental.

Chapter 3 entitled “**Experimental validation of effectiveness of the methodology of the students’ environmental literacy and perceptions of students and teachers**” presents, in its first part, the research methodology and an explanation about the intervention program: description, background, uniqueness, target population and targets. The second part presents the findings of the quantitative analysis of the questionnaires that include the students’ EL level in all types of schools participating (according to the sequence: knowledge, attitudes, affect, behavior and skills), the connection between EL and background variables (source of knowledge, gender, father’s educational level, mother’s educational level, parental profession) and correlation between EL components. The third part, which is actually the qualitative part, presents the inductive content analysis of the group interviews (focus groups) with students and the interviews with teachers about their general environmental perceptions and their perceptions regarding the environmental programs, their goals and their contribution. The last part of the chapter is mainly a discussion round the research findings.

Research methodology: The traditional approach that was accepted until the eighties in the research field of the EE was based on quantitative scientific methods [12]. During the last two decades, there has been a significant development in this area following the change in the ecological world view and in the perception of the educational research in general. Following this, the need to expand the methodological basis of the EE and to include a wider range of methods that can meet a wide variety of research questions was arisen. This matter allowed expanding the areas of research in EE beyond learning. This research is based on a mixed research method that combines between the quantitative method and the qualitative approach. Using mixed research arrays allow researchers to mix and to match between components of the research array and

due to this they have the best tools to provide answers to specific research questions. Therefore, using mixed research arrays has become a common practice among researchers in general, and among evaluators in particular.

Research environment: In this research two groups were involved: sixth grade students of five primary schools in the Arab sector, two green schools (with “green school” program) and three non-green schools (without environmental programs) and teachers from one green school and one non-green school (in which the intervention program transferred). Sixth grade students were selected in this research since on the one hand they are fluent enough, it’s their last year at school, they studied various issues relating to the environment and it is expected from them to express an opinion on issues related to the environment. Therefore, they can be asked about their perceptions toward issues they had learned in primary school over the years. And on the other hand, students in primary schools are an excellent target population for EE because they are relatively not old and it’s still possible to influence their knowledge, awareness and behavior. Such researches, that focus on students of primary schools, can contribute a lot to raise the level of EL of students in primary schools in the future, because as we start raising environmental awareness at a younger age the better the chance to develop in children a deep appreciation for nature as part of their values system. Number of schools and students participated in the research are presented in table (1).

Table 1 – Number of schools and students participated in the research

	Type of school	Number of schools	Number of students
At the beginning of the year	Green school	2	150
	Non-green school	2	138
	Non-green school + intervention program	1	73
	Total	5	361
At the end of the year	Green school	2	144
	Non-green school	2	136
	Non-green school + intervention program	1	71
	Total	5	351

Group interviews with students (Focus group) were conducted at the beginning and at the end of the school year. Number of focus groups and students are presented in table (2). Personal interviews with teachers: At the beginning of the school year, four interviews were conducted with teachers in a green school and four others were conducted with teachers in a non-green school. At the end of the year, four interviews were conducted with the same teachers in the non-green school.

Table 2 - Number of focus groups and students who participated in the focus groups

	Focus groups In non-green school	Focus groups In green school
At the beginning of the school year	1. 27 students 2. 24 students Total 51 students	1. 27 students 2. 26 students Total 53 students
At the end of the school year	1. 25 students 2. 28 students Total 53 students	

The research was conducted according to the following stages:

1. Evaluating the EL level in five schools through questionnaires (quantitative analysis). (At the beginning of the school year 2013/2014).
2. Examining the environmental perceptions and perceptions regarding environmental programs, of students and teachers, in one green school and in one non-green school through focus groups and personal interviews (qualitative analysis). (At the beginning of the school year 2013/14).
3. Planning, building and transferring an intervention program for teachers in a non-green school. (during the school year 2013/2014).
4. Re-examining the environmental perceptions and perceptions regarding environmental programs, of students and teachers, in the non-green school in which the intervention program was transferred through focus groups and personal interviews (qualitative analysis). (At the end of the school year 2013/2014).
5. Re-evaluating the level of EL in the same five schools, through questionnaires (quantitative analysis). (At the end of the school year 2013/2014).

Data collection - During the research, data was collected through questionnaires, personal interviews with teachers and group interviews (focus groups) with students. The questionnaire was designed especially for the research and based on existing research tools, local and international, which are considered as milestones in the field of EL assessment. It is divided into six sections that examine personal information and environmental awareness, environmental knowledge, attitudes on environmental issues, environmental affect, environmental behavior and skills. The questionnaire contains multiple-choice questions, questions of Likert scale type and open questions. The personal interviews with teachers were private and semi-structured. The questions were prepared in advance and were used as a basis for the dialogue between the researcher and the interviewees. All interviews were conducted face to face and were recorded on tape. The purpose of the interviews was to identify the teachers' environmental perceptions and their perceptions regarding the environmental programs. Using focus groups help to collect information that cannot be reached in other ways, to get a variety of responses, to view multiple

interactions, to enrich the information collected by other tools and there for it is a better basis for the research. The purpose of the group interviews with students (focus groups) was to identify the students' environmental perceptions and their perceptions regarding the environmental programs.

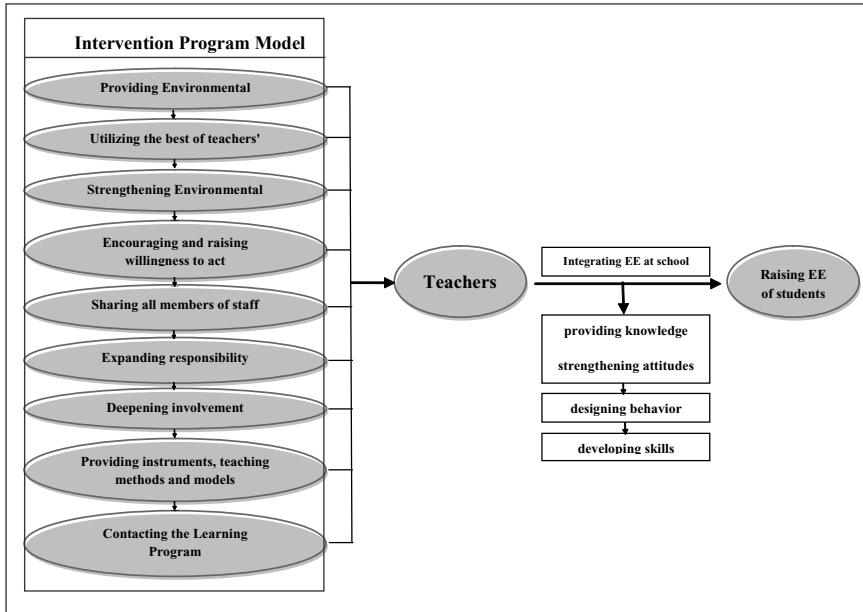
The intervention program was designed by the researcher according to the data received from the pre-questionnaires. The program was activated according to the "learning teachers' room" method and sought to raise the level of students' EL. Most of the teachers at school have regularly attended the program. The teachers were asked to integrate EE in all teaching fields. The intervention program is actually an annual training course, consisted of 14 sessions of two/three teaching hours (total 30 teaching hours). The program included lectures, workshops and tours about environmental issues, in which issues were raised, discussions were conducted, teaching models were taught, work groups were activated, teachers watched films and presented lessons that were delivered or will be delivered according to the teachers' expertise, materials from the teachers' experiences were raised and discussions will conducted (presentation and analyzing a case Study). The workshops were supposed to prepare and support teachers in their work practice at school regarding EE.

The program objectives: Providing environmental knowledge about issues relevant to the teachers' fields of work; Getting the best of the different skills and the diverse capabilities of all teachers in the school; Strengthening teachers' environmental perceptions and perceptions about their role as active designers of environmental attitudes and behaviors among students; Encouraging teachers and raising their level of willingness to work with their students for the environment; Sharing all the teachers at school in the environmental program and integration of EE in all fields of study; Expanding the responsibility and deepening the involvement of staff: not to throw the responsibility solely on stakeholders teachers who work sometimes alone without support in actions and also not on the teachers whose teaching fields are significantly more related to environment (teachers of science, environmental science, geography and homeland) so that the environmental issue would not receive only a scientific orientation without a wide social-cultural context; Providing a significant interactive teaching model related to EE; Contacting the ongoing learning and the curriculum of the school; and Raising the level of EL of students in the school [28].

The emphasis in this program is on experiential and practical learning, and on action for the environment. The intervention program model is presented below in fig. 2.

Before transferring the intervention program, personal interviews were conducted with some of the teachers participating in order to identify their environmental perceptions and their perception regarding the goals and the effectiveness of the environmental program existing at school and after completion of the program, interviews were conducted with the same teachers in order to identify the contribution of the intervention program to their work in environmental issues.

Fig. 2 – The Intervention Program Model



Discussion in the main findings of the research: This research was conducted in order to examine the impact of environmental programs on students' EL and it focused on the “green school” program and the intervention program that was developed by the researcher and designed specifically for teachers who are in daily contact with the students. The main purpose of the program was to raise the students' EL level indirectly. Environmental perceptions and perceptions concerning the goals and the contribution of the environmental programs, of teachers and students, were also incorporated into in this research.

Summary of research Findings: The general environmental knowledge of sixth graders in primary schools of the Arab sector is inadequate [31]. There was no difference in the level of environmental knowledge between the beginning and the end of the school year in green and non-green schools. The students' level of knowledge in green schools was slightly higher than the students' level of knowledge in non-green schools, at the beginning (fig. 3), and at the end of the school year. The level of knowledge in the school in which the intervention program was transferred later was the lowest among all five schools participated in the research at the beginning of the school year, but towards the end of the year and after transferring the intervention program, the knowledge level had significantly increased (fig. 4).

Fig. 3 - Environmental knowledge of green schools compared to non-green schools at the beginning of the school year

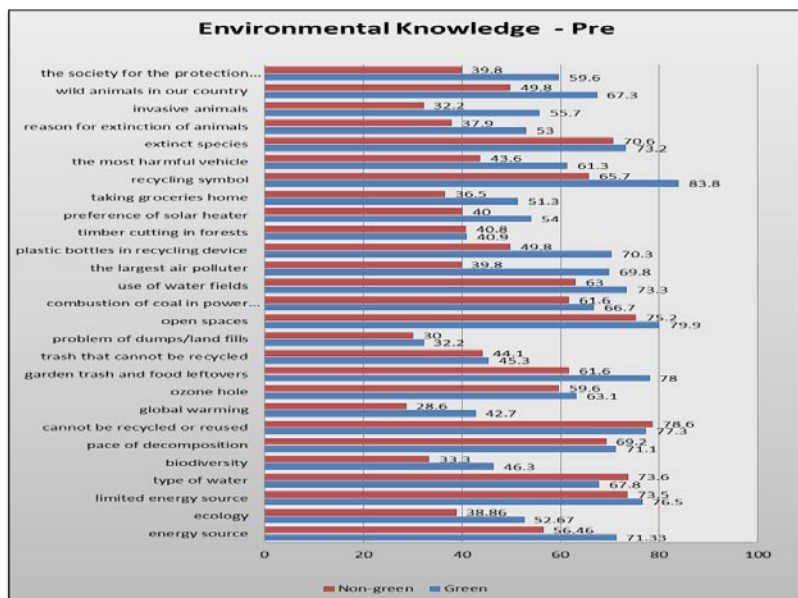
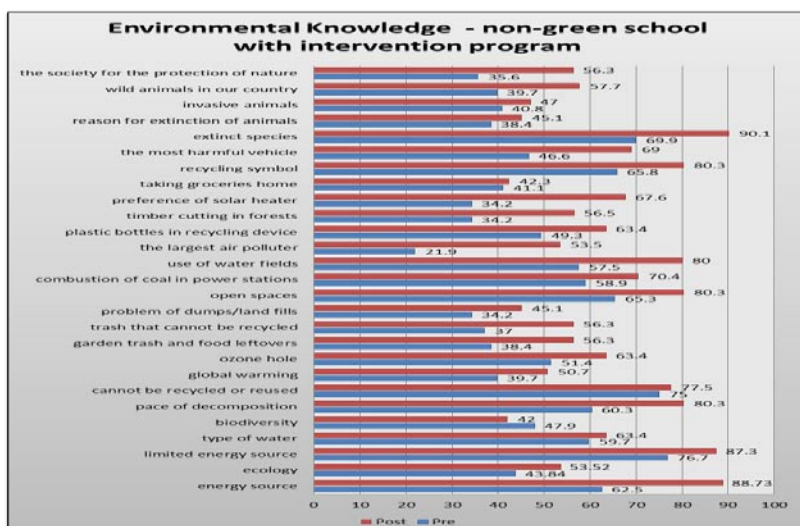


Fig. 4 - Environmental knowledge of the non-green school with intervention program at the beginning and at the end of the school year



At the beginning of the school year, the difference in the level of knowledge between the school with the intervention program and the green schools was significant in favor of the green schools, however, at the end of the year there was almost no difference between them and maybe a little in favor of the school with the intervention program. The difference in the level of knowledge between the school with the intervention program and the non-green schools was not significant at the beginning of the school year, however at the end of the school year the difference was significant in favor of the school with the intervention program and that proves that the intervention program had a positive impact on students' environmental knowledge.

In general, attitudes and willingness to act for the environment of all participating students were positive. Students' attitudes in "Green schools" were slightly more positive than the students' attitudes in non-green schools, at the beginning, and at the end of the school year [31]. This was expected because one of the goals of the environmental program "Green school" is to develop and strengthen positive attitudes towards the environment. In the school in which the intervention program was transferred, the students' environmental attitudes were similar to the students' attitudes in non-green schools and a little less positive than the green schools at the beginning and at the end of the school year. This proves that the "Green school" program succeeded to influence the students' attitudes to be more positive better than the intervention program despite the fact that the impact of the two programs has been positive. In general, the students' affect towards the environment was positive.

The environmental affect had improved during the school year (with and without green school program) in all types of schools [31]. Students in green schools expressed love for animals, plants and nature a little more than other schools, but without a significant difference. In non-green schools the increase in affect was greater than in green schools. In the school in which the intervention program was transferred, the increase in affect was significantly larger and this indicates that there was an emotional involvement following the program (fig. 5). The emotional engagement can change attitudes, strengthen the willingness to act for the environment and to make decisions regarding ethical issues and environmental [2].

In general, the behavior level of the students was minimal to moderate [31]. There was no difference in behavior in all types of schools at the beginning and at the end of the school year as well as in school in which the intervention program was transferred. This could be due to previous behavioral habits. Behavior in green schools included more fields and a some what higher level than in non-green schools but the differences were not significant. The environmental behavior of green schools compared to non-green schools at the end of the school year is presented in (fig.6).

Fig. 5 - Environmental affect of non-green school with intervention program at the beginning and at end of the school year

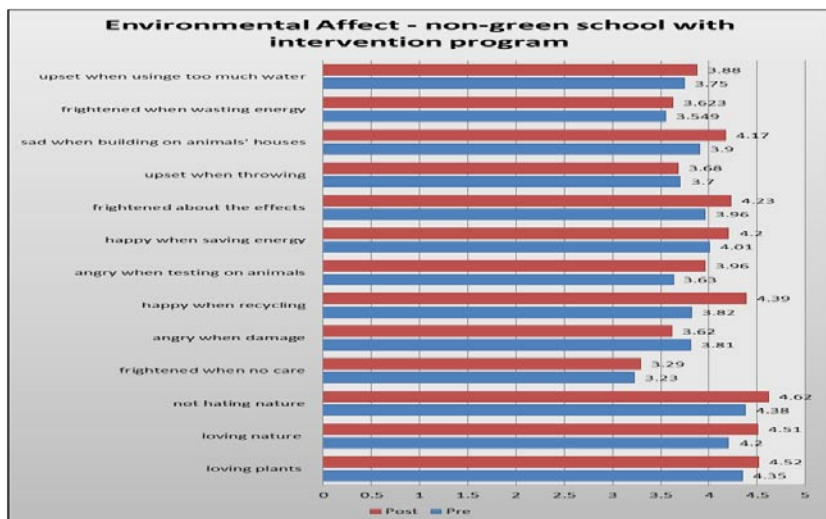
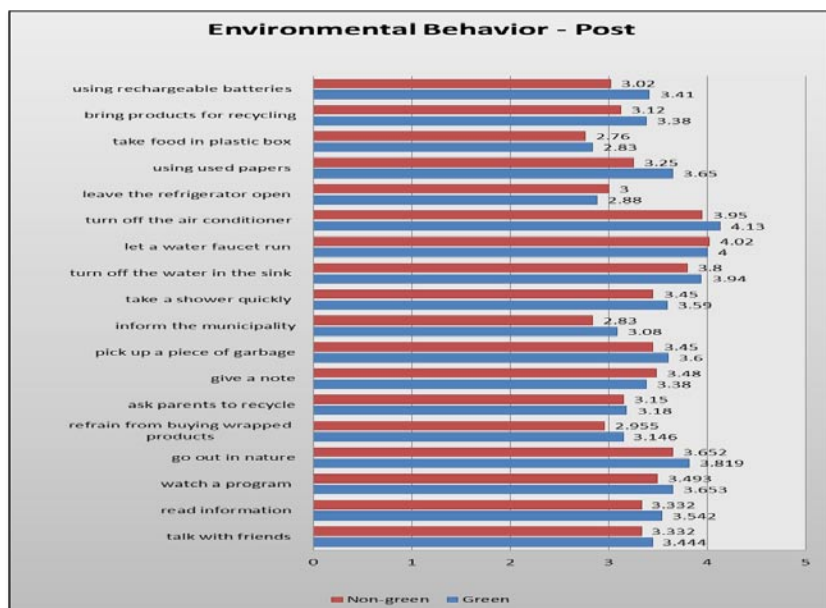


Fig. 6 - Environmental behavior of green schools compared to non-green schools at the end of the school year



The differences between green schools and the school with the intervention program, in which students are more involved in the natural environment, and the rest of the schools, match the findings of the research that was conducted by Negev and her colleagues [22] on sixth and twelfth grade students from 182 schools, in which was found that students who were more involved in nature scored higher in knowledge, attitudes and behavior dimensions and students who were more exposed to natural experiences scored higher in all dimensions. Total scores of all the EL components, in all types of schools, at the beginning and at the end of the school year are presented below in table (3) and table (4).

Table 3 - Scores in knowledge, attitudes, affect and behavior at the beginning of the school year

	All schools		Green schools		Non-green schools		Non-green school with intervention program	
	S	SD	S	SD	S	SD	S	SD
Knowledge	56.08	14.24	62.38	13.52	51.61	15.78	49.11	14.28
Attitudes	73.82	6.57	74.81	6.89	72.44	6.43	72.45	8.69
Affect	77.91	6.3	79.30	6.66	76.99	6.35	77.36	6.20
Behavior	66.65	7.79	66.84	10.55	66.52	5.94	69.01	5.73

(S: Score, SD: Standard Deviation)

Table 4 - Scores in knowledge, attitudes, affect and behavior at the end of the school year

	All schools		Green schools		Non-green schools		Non-green school with intervention program	
	S	SD	S	SD	S	SD	S	SD
Knowledge	57.36	13.9	62.76	11.77	53.60	16.45	63.85	14.91
Attitudes	73.52	6.92	74.46	7.00	73.38	6.74	73.36	8.45
Affect	80.42	6.8	80.91	7.92	80.12	6.14	81.06	7.96
Behavior	67.87	7.16	69.61	7.32	66.71	7.30	69.01	8.04

(S: Score, SD: Standard Deviation)

Regarding skills, in all types of schools, the number of students who answered the questions was small and the number of students from those who

were able to fully identify the problem was also small, but most of them succeeded in partially identifying the problem. Regarding suggesting solutions to the problem, a small number of the students who answered the question was able to suggest two solutions to the problem but most of them succeeded to suggest only one solution. The overall score of skills was relatively low in all types of schools. This matches the findings of the research that was conducted by Marcinkowski and colleagues [15], in which it was found that the skills level is the lowest among all the dimensions of the EL. The intervention program has positively impacted the students' skills and helped them to think more deeply and to suggest correct solutions to the proposed problem, but there was no significant difference in the final score of skills between the school with the intervention program and the rest of the schools. Total scores of skills in all types of schools, at the beginning and at the end of the school year, are presented below in table (5) and table (6).

Table 5 - Scores of skills at the beginning of the school year

	All schools		Green schools		Non-green schools		Non-green school with intervention program	
	S	SD	S	SD	S	SD	S	SD
Skills	49.52	9.49	48.46	9.30	49.93	9.62	47.86	10.63

(S: Score, SD: Standard Deviation)

Table 6 - Scores of skills at the end of the school year

	All schools		Green schools		Non-green schools		Non-green school with intervention program	
	S	SD	S	SD	S	SD	S	SD
Skills	50.65	7.54	48.00	7.50	52.61	7.62	53.46	5.89

(S: Score, SD: Standard Deviation)

In general, the majority of students have a moderate level of EL and a small portion of the students have a high or low level of EL. According to the findings of this current research, students who were exposed to EE received higher scores of EL and this validates the definition of Hsu that EE helps the individuals develop awareness of, knowledge and attitudes toward the natural environment, acquire skills and motivation to act actively and resolve environmental problems and issues, and develop active involvement in preventing environmental problems and protecting and improving environment [9]. And the setting of the fundamental aim of EE is to develop environmentally literate people who have responsible environmental behaviors [11].

Regarding **correlations between EL components**, many studies have examined the impact of EE programs on the students' EL level and correlations between EL components. The researchers Kaiser et al. [13] found a high correlation between the EL components. However, in 1990, the researchers Hungerford & Volk claimed that this connection has not been substantiated in many studies. The researcher Rickinson [24] investigated the effect of environmental programs on EL and found out that some of them affected certain components and some did not affect at all. The researches Hungerford & Volk [11], and Rickinson et al. [24] and others found out that the relations between the dimensions of EL are complex. In this research, it was found that a high level of knowledge does not necessarily bring more positive affect and behavior. More positive attitudes bring more positive affect and behavior and vice-versa. More positive environmental affect brings more positive behavior and vice versa. A significant correlation was found between knowledge and awareness and knowledge and attitudes but no significant correlation was found between knowledge and behavior.

Regarding the **relation between EL and the independent variables**, it was found that students whose source of knowledge was varied received the highest total score in EL. Students whose source of knowledge was only the school received the highest score out of the students who chose a single knowledge source, followed by the students whose source of knowledge was the television, followed by the computer and at the end members of the family. No significant difference in EL was found between boys and girls. This contradicts the research that was conducted by Bloom [3] on ninth graders, from 24 different schools in order to test knowledge, attitudes, source of knowledge and connection to background variables, in which was found that boys got higher scores in all subjects. No significant difference was found in EL of students in relation to father's education level. No significant difference was found in EL of students in relation to mother's education level. This contradicts the research of Goldman et al. [7] in which was found that students whose mothers have higher education level showed a more responsible behavior for the environment, especially in matters of recycling. No significant difference was found in EL of students in relation to parents' profession. No significant difference was found in EL of students in relation to time spent outdoors.

Perceptions of students-This research are a mixed research that examines the impact of environmental programs, according to the sustainability approach, on the students' EL. It was very important in this research to identify environmental perceptions and perceptions regarding environmental programs, of students and teachers participating in the research. Identifying perceptions and interpreting them may advance the understanding of how students and teachers relate to the environment and environmental programs. It may also reflect their understanding regarding the objectives of the EE. Accordingly, the second research question focused on environmental perceptions and perceptions regarding environmental program of students and teachers participating in the research. It is very important to clarify the percep-

tions of those involved in EE from several assumptions: the ways in which people experience the environment and understand it, affect their environmental behavior and thus it is very important to decipher these understandings [14]. Students perceive the concept of environment in different ways according to the biocentrism and the anthropocentric approaches that were described by Stern & Dietz [35] and the sustainability approach that was described by Wals [40]. Similar approaches were identified in the research of Loughland, Reid & Petocz [14]. Students from the non-green school referred to environment more as a source of enjoyment and relaxation compared to students from the green school who referred to environment as a set of biotic and abiotic factors. Most of the students referred to environment from a narrow ecological aspect which is compatible with the research of Shepardson, Wee, Priddy & Harbor [33] who found that the prevailing perception is the perception of the environment as a natural place without human. Regarding the natural and the artificial environment, the students from the green school referred to the human act and students from the non-green school referred to the comparison between wild animals and plants and cultivated plants and domesticated animal. This shows that the science side is stronger in non-green schools compared to the strong environmental side in green schools. Students from the non-green school noted that only teachers of science and geography refer to environmental issues however students from the green school noted that most of the teachers in their school refer to environmental issues. Teachers in green school usually receive training about environmental issues and sustainability consisting of four meetings [43]. When students were asked about the goals of environmental programs and the expectations from them, students from green school were able to better define the goals of the environmental program and the expectations from it according to the sustainability approach versus students from non-green school referred more to the appearance of the school and to the knowledge enrichment and did not refer to attitudes, affect and behavior. This shows that programs for sustainable education deal with both the conceptual and the practical level in four aspects: knowledge, skills, values, behaviors [44]. When the students from both types of schools were asked about the environmental problems that they are familiar with, they referred to local problems at school and neighborhood and did not refer to global problems. Regarding the cause for the problem, students from green school accused more the individual and the students themselves but students from non-green school accused others, such as the establishment and the municipality. This shows that the relationships between the non-green schools and the municipality are not good and that students believe that their lives and their decisions are controlled by a higher power versus students in green schools believe they are in control of themselves and their lives. Many studies have shown similar results [11]. Regarding the school action, students from green school referred to action in a broader sense compared to students in non-school school who referred to action in a sense related to cleaning. At the end of the school year and after transferring the intervention program in the non-green school, the perceptions were less diverse and more according to the sustainability approach. The students'

answers were less descriptive and deeper and this points to the positive impact of the intervention program. They noted that most of the teachers in the school refer to environmental issues. Regarding the goals of environmental programs, students referred, besides the knowledge enrichment, to the relationship between man and nature, to the love of nature and to the concern for the environment. At the beginning of the school year the students' mind was targeted in knowledge but at the end of the school year it included knowledge, attitudes and behavior. In relation to environmental problems, students referred more to daily activities and human damages and in relation to the causes for the problems, students less accused the others and more accused themselves. Students refer to teachers as designers of behavior and as an example of personal involvement and action for the environment. When students talk about the school action they included more fields in their answers.

Perceptions of teachers - Identifying teachers' perceptions in this research had contributed significantly to the understanding and analysis of the students' EL level and to planning and adapting training programs about environment for teachers in primary schools. Perceptions of teachers are very important because they are the key to the implementation of significant EE in the educational system and to the development of EL among students [17]. Perceptions of teachers identified in this research were also varied and parallel to the biocentric, anthropocentric and sustainability approaches. Teachers in green school perceive the concepts environment, natural environment and artificial environment more according to the sustainability approach however teachers from non-green school perceive the environment more according to the anthropocentric and biocentric approaches but at the end of the school year they had more tendency to the sustainability approach. Teachers in green school perceive themselves as owners of high level of environmental knowledge, environmental awareness and environmental experience. Teachers in non-green school perceived themselves, at the beginning of the school year, as owners of a moderate level of environmental knowledge, awareness and behavior but at the end of the school year, most of them perceived themselves as owners of a high level of environmental knowledge, awareness and behavior. Regarding the question about the goals of environmental program, the teachers' answers in green school included more fields while the teachers' answers in non-green school focused on knowledge, connection with nature and appearance of school and neighborhood. At the end of the school year, the teachers' answers included more fields such as responsible behavior and positive attitudes towards the environment. Teachers from both types of schools had high expectations from the environmental programs. Teachers in green school see their students as owners of a moderate level of environmental awareness and environmental action. Conversely, teachers in non-green school saw their students, at the beginning of the school year, as owners of a low level of environmental awareness and environmental action, but at the end of the school year they saw them as owners of a moderate level of environmental awareness and environmental action and blamed themselves and their parents. When teachers were asked about the school

action, teachers from green school referred in their answers to the society and the economy but teachers from non-green school referred to specific actions but at the end of the school year they referred also to society and economy. Teachers from both types of schools were aware of environmental problems and referred more to local problems. Regarding the causes for the environmental problems, teachers from the green school accused students and their parents and teachers from the non-green school, at the beginning of the school year, more accused the municipality but at the end of the school year they less accused the municipality and more accused themselves, the students and their parents. Regarding the goals of the environmental programs, most teachers, at the end of the school year, stated objectives of strengthening knowledge, attitudes, behavior, values, and affinity to environment. These aspects are the basic components of EL [23]. According to Orr [23], education for EL is the proper way to implement EFS. Teachers from both types of schools were not aware of organizations and agencies that work for the environment, apart from the Ministry for the Protection of Environment and the Jewish National Fund, but at the end of the school year they were aware of more organizations. According to the above findings, the obvious difference that existed between the green school and the non-green school at the beginning of the school year stems from a lack of teachers' training in environmental issues. This conclusion was received in many studies that show that insufficient EE in teacher training is one of the obstacles of the successful implementation of the EE in schools [4].

According to the findings, it is very clear that students' perceptions are equivalent to teachers' perceptions at the same school and that shows that students' perceptions are affected by the teachers' perceptions. Therefore, if the main goal of the EE is the EL of students then the start should be with teachers who are in daily contact with the students and have the greatest impact on them. Perceptions of teachers are very important because they are the key to the implementation of significant EE in the educational system and to the development of EL among students [17].

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Trough our research we found that the general level of environmental knowledge is insufficient. Most students in primary schools in the Arab sector are not exposed to the field of environmental knowledge in an adequate form. The green-school program has positively influenced the knowledge; however the positive effect of the intervention program was greater on knowledge.

The important scientific problem solved in the research was to analyze the theoretical and methodological aspects of the impact of the ecological literacy programs on the students from the sixth grade in the Arab sector from Israel and ecological perceptions of students and teachers about them in terms of harnessing

the intervention program for teacher training in environmental education field in order to streamlining sustainable approach of the environmental behavior.

1. Studying literature and international documents, we identified the vital importance of environmental education in general and relevance of constructive attitudes of students towards the environment. In general, students' attitudes towards the environment are positive, they expressed positive attitudes towards the environment and solidarity with environmental values associated with the protection of environment. Attitudes of students in green schools were a little more positive than the attitudes in the rest of the schools, especially concerning green consumerism. The intervention program did not improve the students' attitudes as did the green school program but at the end of the school year the results were similar.

2. The ecological literacy methodology was oriented to determine the impact of the "Green School" on environmentally positive attitude, which was higher than the impact of non-green curriculum in schools. The impact of the green school program on the environmental affect was adequate but not greater than the impact of the curriculum in non-green schools. The regular curriculum had greatly contributed to the environmental affect of students. The intervention program had a positive impact on the students' environmental behavior.

3. The level of environmental behavior, in general, is inadequate. There were no differences in the level of behavior between green schools and non-green schools but in green schools the students' behavior included more fields. The intervention program had no significant effect on behavior.

4. The level of skills concerning environmental issues in general is inadequate. The intervention program had a positive impact on skills and especially on the ability to suggest a suitable and correct solution to the environmental problem, but compared with other types of schools, the difference was not significant.

5. The environmental awareness level, in all types of schools, at the beginning of the school year, was relatively moderate. The level increased in all types of schools but it increased the most in the green schools. The effect of the intervention program on awareness was positive. In general, the impact of the intervention program was almost identical to the impact of the green school program. Also, a connection was found between the environmental awareness level and the EL level, especially with affect and skills components. There is a gap between the environmental knowledge and the rest of the EL components. A high level of Knowledge, concerning environmental issues, does not necessarily bring positive attitudes, positive affect and positive behavior for the environment.

6. A moderate correlation was found between attitudes and affect and between attitudes and behavior. A moderate correlation was also found between affect and behavior. Students with positive attitudes and positive affect reported about more positive behavior for the environment. In general, no significant correlation was found between EL components. The relation between EL and background vari-

ables is limited. No significant of background variables on EL was found. However, regarding the source of knowledge, the school is considered to be an important source of environmental knowledge in order to raise the students' level of EL. After school comes the television followed by the computer. Diverse sources of knowledge contribute more than a single source of knowledge source to the increasing of the students' EL level.

7. According to the almost identical results between the green and the non-green schools, it is most likely that within the fields of science and geography, environmental issues are integrated in the formal school curriculum, however the students in both types of schools, green and non-green, are exposed a little to environmental issues and this exposure is with a scientific focus and not with an environmental focus. This means the goals of the program and the methods of teaching and learning must be adjusted to the needs and the perspectives of the community, approached in a holistically way.

8. The environmental programs that were examined in the research, the green school program and the intervention program, that was developed specifically for this research, had a positive effect on the EL components but the overall level of EL is still not sufficient.

9. Students' perceptions indicate differences related to EE: the fact that students from the green school referred to the environment according to the sustainability approach more than the students from the non-green school shows a lack of dealing with the subject of environment in the curriculum. Highlighting the issue of cleanliness in the non-green school versus highlighting the subject of the need and the responsibility of society to take care of the natural resources in the green school shows the difference in the EE level taking place in schools. Students' environmental perceptions identified in this research were mostly parallel to the biocentric and the anthropocentric approaches and a little part of them were parallel to the sustainability approach. The reason may be because of the age of the students. They are not yet ripe enough to reply according to this approach. Regarding the environmental problems, students in the non-green school more accused the establishment or the municipality and less accused themselves however students in green school referred to the personal responsibility of the individual in the society. This shows that the relationships between the non-green schools and the municipality are not good and it also shows that students believe that their lives and their decisions are controlled by a higher power versus students in green schools believe that they control themselves and their lives. At the end of the school year and after transferring the intervention program, the students' perceptions tended more to the sustainability approach and this insures the positive impact of the program.

10. Teachers' perceptions were also diverse and parallel to the biocentric, anthropocentric and sustainability approaches. From the analysis of the teachers' perceptions, it was found that there is a need to deepen the understanding of teachers regarding environmental issues through appropriate training. Proper

training can contribute a lot to teachers, to students and to the school climate. At the end of the school year, most teachers stated goals of strengthening knowledge, attitudes and behavior, values and affinity to environment. These aspects are the basic components of the EL. Most teachers stressed the importance of the environmental programs designed for teachers. This insures the positive impact of the intervention program. Raising teachers' awareness and their participation, has contributed to the raising of the students' EL which is considered as a key target of the EE.

Final conclusion: The intervention program can pose an example of an educational program that promotes EE according to the sustainability approach, and aims to raise the students' EL level.

RECOMMENDATIONS

The research findings and conclusions raised many interesting questions which can be answered in other researches. I recommend on several possible directions.

Decision Makers' Level:

1. To develop a multi-year training program for the educational staff in school that is based on the same criteria of the proposed intervention program in the research.
2. To develop a special environmental program that aims to strengthen the skills of the students concerning environmental issues and particularly the issue of dealing with environmental problems and proposing solutions to problems.
3. To increase the commitment of the Ministry of Education to the subject of EE and to the implementation of sustainable policies in primary schools in the Arab sector.
4. To prepare updated and available teaching materials on environmental issues in Arabic language for the teachers in the Arab sector.
5. To examine in depth the existing environmental programs in order to ensure that in the future they will provide the maximum educational benefit.

Schools' Level:

6. To trace the impact of the green school program and to perform the same comparison between green schools and non-green schools in other areas of the country in the Arab sector.
7. To transfer the same intervention program to other schools (with and without environmental programs) and to examine its impact on the EL of students.
8. To examine the level of EL in private schools and to compare with governmental schools in the Arab sector.

Teachers' Level:

9. To train the educational staff in school to a teaching that combines EE according to the sustainability approach.
10. To deepen the identification of the perceptions and the attitudes of the educational staff at school because it contributes to the development of appropriate environmental training programs in the field of EE and to the raise of the students' EL level.

Students' Level:

11. To examine the impact of home culture on the students' EL.
12. To expose all the students in school to the subject of environment by incorporating the subject in all the teaching professions.

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ANNOTATION

Author: Rania Shalash

Theme: *Theoretical and Methodological Approaches of Environmental Education with- in Primary Schools in the Israel Arab Sector. Doctoral Thesis in Pedagogy, Chişinău, 2017*

Thesis structure: Annotations (in Romanian, Russian and English), introduction, three chapters, general conclusions and recommendations, bibliography (207 sources), 17 annexes, 177 pages of the basic text, 42 tables, 15 figures.

Key concepts: Environmental Education, Environmental Literacy, Sustainability, Sustainable Development, Education for Sustainable Development, Environmental Programs, Green School Program, Environmental Perceptions.

The research domain: General Theory of Education.

The research goal is to analyze the theoretical framework of the EE programs impact on ecological literacy of students and the environmental perceptions of students and teachers and to develop the methodology integration of EE in the curriculum at the primary level in the Israel's Arab sector.

The research objectives are: to analyse the theoretical aspects of EE through extrapolate from the current EL of students in sixth grade in primary schools in the Arab sector, in general; to identify the EE methodological items by comparing the link between EL components (knowledge, attitudes, behaviors and skills); to evaluate the impact of the contextual training factors (source of knowledge, sex, education level and occupation of parents, time spent outdoor) on EL of students in sixth grade; to develop an intervention program in order to prepare teachers to integrate EE into their study plan to improve the EL of students in sixth grade; to determine the impact of the intervention program on EL of students from the sixth grade and on environmental perceptions of teachers and students involved in the process.

Scientific novelty and originality of the research: Using ecocentric, antropocentric and sustainable environmental development approaches in the elaborated methodology of integration of EE in primary education in the Arab sector of Israel, focused on knowledge, strengthening perceptions and responsibility, boosting involvement, actions and practical applications. Elaborating the methodology which will contribute to improve student's EL focused on turning complex conceptual theoretical precepts, priority policy and international environmental science.

The important scientific problem solved in the research was to analyze the theoretical and methodological aspects of the impact of the ecological literacy programs on the students from the sixth grade in the Arab sector from Israel and ecological perceptions of students and teachers about them in terms of harnessing the intervention program for teacher training in environmental education field in order to streamlining sustainable approach of the environmental behavior.

Practical value of the research: The research results can be used to implementate the EE programs in formal and informal context, in order to support the educational institutions, especially those in the Arab sector, to create and implement programs working models and teaching methods in environmental programs. The research conducted to considerable practical contributions on teachers training in EE. The recommendations will influence educational leaders and decision-makers and will contribute to promoting quality EE in primary schools of the Arabic sector. They will also influence the promotion of education for sustainable development through training programs, through involvement and adequate environmental behavior. Education for sustainable development is important for creating a citizenship responsible behavior and civic values worthy for present and future.

Implementation of the scientific results: The experimental research took place in the state primary schools in the Arab sector, in terms of contextual-holistic educational process, through scientific publications, through practical activities with students, with school and university teachers.

ADNOTARE

Autor: Rania Shalash

Temă: *Repere teoretice și metodologice ale educației ecologice în învățământul primar din sectorul arab al Israelului, Chișinău, 2017*

Structura tezei: introducere, 3 capitole, concluzii generale și recomandări, bibliografie (204 surse), 156 de pagini de text, 35 de tabele, 15 figuri, 7 anexe, adnotări (în română, rusă și engleză), lista abrevierilor și glosarul. Rezultatele obținute sunt publicate în 7 lucrări științifice (5 articole din reviste naționale și 2 comunicări la conferințe internaționale).

Concepte-cheie: educație ecologică, alfabetizare ecologică, sustenabilitate, dezvoltare durabilă, educație pentru dezvoltare durabilă, programe ecologice, programul „Școala verde”, percepții ecologice.

Domeniul de cercetare: Teoria generală a educației.

Scopul cercetării constă în analiza cadrului teoretic al impactului programelor de educație ecologică asupra nivelului de alfabetizare ecologică a elevilor și asupra percepțiilor de mediu ale elevilor și profesorilor și elaborarea metodologiei de integrare a educației ecologice în planul de învățământ în treapta primară din sectorul arab al Israelului.

Obiectivele cercetării: analiza reperelor teoretice ale educației ecologice, prin extrapolarea acestora la nivelul actual de alfabetizare ecologică a elevilor din clasa a șasea din școlile primare din sectorul arab, în general; identificarea reperelor metodologice ale educației ecologice prin compararea legăturii dintre componentele alfabetizării ecologice (cunoștințe, atitudini, comportamente și competențe); evaluarea impactului factorilor contextuali de formare (sursa cunoștințelor, sexul, nivelul de educație și profesia părinților, timpul petrecut afară/în aer liber) asupra nivelului de alfabetizare ecologică a elevilor din clasa a șasea; elaborarea unui program de intervenție cu scopul de a pregăti profesorii să integreze educația ecologică în planul lor de studii, pentru a ameliora nivelul de alfabetizare ecologică a elevilor din clasa a șasea; determinarea impactului programului de intervenție asupra alfabetizării ecologice a elevilor din clasa a șasea și asupra percepțiilor profesorilor și ale elevilor implicați în proces.

Noutatea științifică și originalitatea cercetării constau în valorificarea abordărilor ecocentrică, antropocentrică și sustenabilă de mediu în elaborarea metodologiei de integrare a educației ecologice în învățământul primar din sectorul arab al Israelului, constituită din cunoștințe, consolidarea percepțiilor ecologice, creșterea responsabilității, impulsionearea implicării, a acțiunilor și a experimentării la nivel practic. Metodologia elaborată contribuie la îmbunătățirea nivelului de alfabetizare ecologică al elevilor, axat pe valorificarea conceptuală complexă a preceptelor teoretice, prioritare în politica și știința despre mediu la nivel internațional.

Problema științifică importantă soluționată în cercetare vizează analiza reperelor teoretice și metodologice ale impactului pe care îl au programele de alfabetizare ecologică a elevilor din clasa a șasea din sectorul arab al Israelului și a percepțiilor ecologice ale elevilor și ale profesorilor cu privire la acestea, din perspectiva valorificării unui program de intervenție pentru formarea cadrelor didactice în domeniul educației ecologice, în vederea eficientizării abordării sustenabile a comportamentului de mediu.

Importanța practică a cercetării: Rezultatele cercetării pot fi folosite ca fundament pentru implementarea programelor de EE în contexte formale și informale, în susținerea instituțiilor de învățământ, în special pe cele din sectorul arab, să creeze programe și să implementeze modele de lucru și metode de predare în proiectele ecologice. Cercetarea realizată demonstrează rolul practic semnificativ al formării continue a profesorilor în EE. Recomandările formulate vor influența factorii de decizie și vor contribui la promovarea EE de calitate în școlile primare din sectorul arab. De asemenea, vor influența promovarea educației pentru sustenabilitate prin intermediul programelor de instruire, prin implicare și comportament ecologic adecvat. Educația pentru sustenabilitate este importantă pentru formarea cetățenilor cu un comportament responsabil și cu valori civice demne, pentru prezent și viitor.

Implementarea rezultatelor științifice s-a produs în cadrul conferințelor și al experimentului în școlile primare din sectorul arab din Israel în anii 2013-2015.

АННОТАЦИЯ

Автор: Rania Shalash

Тема: *Теоретические и методологические подходы к экологическому воспитанию в начальных школах арабского сектора Израиля.* Диссертация на соискание ученой степени доктора педагогических наук, Кишинев, 2017.

Структура диссертации: Введение, три главы, общие выводы и рекомендации, библиография (215 источников), 180 страниц основного текста, 41 таблица, 15 рисунков, 16 приложений, аннотация (на румынском, русском и английском языках), список сокращений, словарь терминов. Полученные результаты были опубликованы в 7 научных работах (5 статей в журналах национального уровня и 2 доклада на международных конференциях).

Ключевые слова: экологическое воспитание, экологическая грамотность, устойчивость, устойчивое развитие, образование в целях устойчивого развития, экологические программы, программа «Зеленая школа», экологическое восприятие.

Объект исследования: Общая теория образования.

Цель исследования: Проанализировать теоритические основы воздействия программы экологического воспитания на уровень экологической грамотности учеников и над экологическим восприятиями учениками и учителями и разработать методологию интерграции экологического воспитания в учебном плане начальных школ из арабского сектора Израиля.

Задачи исследования: проанализировать теоритические аспекты экологического воспитания экстраполируя их текущий уровень экологической грамотности учеников шестиклассников из арабского сектора в целом; определение методологических аспектов экологического воспитания сравнивая существующие связи между компонентами экологической грамотности (знания, чувства, поведение и компетенции); Оценивать воздействие фоновых переменных (источник знаний, гендер, уровень образования отца, уровень образования матери, профессия родителей, время, проведенное на воздухе) на уровень ЭГ шестиклассников; разработка программы вмешательства, которая нацелена на подготовку учителей к внедрению ЭГ в учебные планы с целью повысить уровень ЭГ учеников; определить воздействие программы вмешательства на уровень ЭГ шестиклассников и на отношение задействованных учеников и учителей.

Научная новизна и оригинальность работы состоят из освоения эконцентрических, антропоцентрических и устойчивых подходов в разработке методологии интеграции экологического воспитания в системе начального образования в арабском секторе Израиля, фокусирован на предоставлении знаний, на укрепление экологических восприятий, на повышение уровня ответственности и на стимулирование вовлечения, действия и применение на практике. Разработанная методология способствует улучшению уровня экологической грамотности учеников, на освоение теоритических аспектов, которые являются приоритом для политики и науки об окружающей среде на международном уровне.

Важной решенной проблемой в исследовании является анализ теоретических и методологических воздействий, которые имеют программы обучения экологической грамотности учеников из шестого класса в арабском секторе Израиля и экологические восприятия учеников и преподавателей по отношению к ним, с точки зрения внедрения программы для подготовки учителей в области экологического образования, с целью улучшения устойчивого подхода к экологическому поведению.

Прикладная ценность работы: Результаты исследования могут быть применены как основа для имплементирования программы ЭВ в формальных и неформальных контекстах для поддержки учебных учреждений, включая школ из арабского сектора, чтобы они разработали программы и применение рабочих схем и методов обучения в экологических проектах. Разработанное исследование доказывает значимость практической роли повышения квалификации учителей в отрасли экологического воспитания. Рекомендации исследования будут влиять над лицами принимающие решения и будут способствовать к продвижению качественного ЭВ в начальных школах арабского сектора, также будут влиять над продвижением воспитания для устойчивого подхода к окружающей среде при помощи образовательных программ, посредством действий и адекватного экологического поведения. Воспитание для устойчивого подхода к окружающей среде является важной для развития граждан с ответственным поведением и с гражданскими ценностями, достоянные для настоящего и будущего.

Внедрение научных результатов: результаты были одобрены в рамках научно-прикладных конференций и применялись в начальных школах арабского сектора Израиля между 2013 и 2015 гг.

RANIA SHALASH

**THEORETICAL AND METHODOLOGICAL
APPROACHES OF ENVIRONMENTAL
EDUCATION WITHIN PRIMARY SCHOOLS IN
THE ISRAELI ARAB SECTOR**

Speciality 531.01 – General theory of education

Doctoral thesis abstract in pedagogy

Approved to printing 05.01.2017.

Offset paper 2,3.

Offset printing 0,25.

Paper format 60x84 1/16.

Edition 10 ex

Order no 5/17.

Editorial-Poligraphic Center of the State University of Moldova
Str. Alexei Mateevici, 60, Chişinău, MD-2009