University of Szeged
Faculty of Arts
Doctoral School of Education

LENKE MAJOR

THE EXPERIMENT OF INTEGRATION AN ENVIRONMENTAL EDUCATION PROGRAM INTO THE SERBIAN LOWER GRADES' CURRICULUM BY INVOLVING TEACHER TRAINING STUDENTS

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Supervisor:
Dr. Papp Katalin

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CONTENT

INTRODUCTION

The formation of environmental consciousness and ethical behavior towards the environment is extremely crucial in education, to be specific within the frames of environmental education. The environmental issues threatening our planet can be solved only by efficient and purposeful education of the future generations. It is the duty and obligation of every member of the society to protect the environment. Such widespread and accurate protective behavior should be formed at an early age of the individual.

The United Nations proclaimed the period between 2005 and 2014 the Decade of Education for Sustainable Development at the conference of Sustainable Development in Johannesburg. This also indicates that it is highly required to transfer and realize sustainable development and the practice of environmental protection.

Environmental education plays a crucial role in the formation of environment protection, promotes the discovery of various environment related issues as well as facilitates the acquisition of adequate skills that contribute to various solutions to environmental issues using acquired knowledge (*Nagy*, 2008). Environmental education also plays an important role in knowledge transfer of the concept sustainability as well as develops environmental consciousness and facilitates positive relationship building towards nauture (*Dopico* and *Garcia-Vazquez*, 2011; *Bonnett* and *Williams*, 1998). In order to achieve the basic objectives of environmental education, i.e. educate pupils to live environment consciously, seek sustainable solutions and continuous development, it is necessary to offer various programs that involve free and positive activities facilitating independent problem resolution (*Nagy*, 2008; *Carleton-Hug* and *Hug*, 2010; *Grodzińska-Jurczak* et al., 2004; *Monroe*, 2010).

Environmentally conscious behavior, environment-related knowledge and attitudes (and skills) towards their resolution and various actions on behalf of environment protection form the most important factors of environmental education (*Lichtveld*, 2010).

LITERATURE REVIEW

The main objective of environment education is to establish environmentally conscious behavior among humans for the purpose of sustaining our society and nature. This requires change in our attitudes, namely the acceptance of a new and different value system enabling action and decision skills that result conscious alteration of the human's lifestyle (*Varga*, 2003; *Molnár*, 2009; *Song, Zhou* and *Zhang*, 2011).

Three subsystems interact with each other when defining sustainable development: the environmental, the social and economic systems (*Musters, Graaf* and *Keurs*, 1998; *Abolaji, Oke* and *Adebanjo*, 2011; *Lehtonen*, 2004; *López-Ridaura, Masera* and *Astier*, 2002).

Systematic thinking is required to understand the concept of sustainability since the target of investigation (the environment) appears as an integrated system, i.e. it simultaneously emerges as a whole unit and as a unit built up from several segments (*Simon*, 2009); the natural relationships (ordinary patterns) form the basis and cultural relations (specific patterns) take effect originating from natural relationships (*Fűzné Kószó*, 2002; *Fountin, Koppen* and *Leemans*, 2011). Humans continuously experience and interpret the dense interaction of systems, therefore the opinion that sustainability should be approached from various aspects (*Havas*, 2001).

Unfortunately, the approach that environment education should primarily focus on environment and nature protection is still widespread, while the issue of sustainability – should it not be in direct relation with environmental topics – is disregarded (*Vőcsei* et al., 2008).

The identification of environmental issues and the understanding of their origins are not sufficient. For the purpose of problem resolution action-oriented, devoted, environmentally-conscious citizens are required. Thus, the principal role of environment education is the development of environmentally-conscious behavior, value and attitude as well as the knowledge transfer related to environment and society (*Mikházi*, 2006, *Thiengkamol*, 2011). This can be achieved by an early start, since toddlers prove to be responsive to their environment and receptive towards the elements of environment education, i.e. the formation of environment conscious behavior is less challenging (*Sadik* and *Sari*, 2010; *Kopnina*, 2011). Therefore, the system-level, organized realization of the objectives and tasks of environment education can be achieved within the framework of primary school education (*Niklanović* and *Miljanović*, 2008).

Environmental consciousness is a type of lifestyle according to which people, families pay attention to their everyday environmental habits, the issue of drinking water and waste as well as

their relationship with living nature. This continuously conscious lifestyle is primarily based on emotional attitudes (*Mikházi*, 2006).

The education of environmental consciousness is not knowledge acquisition since it focuses on the formation of everyday lifestyle, behavior and outlook on one's life (*Ap, Ertepinar* and *Tekkaya*, 2006), thus environmental education within the frames of formal education should not concentrate on knowledge transfer, but rather the solid establishment of positive attitudes, emotions towards the environment and willingness to take action in addressing environmental issues (*Nahalka*, 1997).

People tend to form attitudes since they are useful tools for orientation within their social environments and maintaining their social relations (*Katz*, 1979). Human actions are influenced by attitudes (*Allport*, 1976, cited by *Mező*, 2008). The personality attitude system affects behavior, so attitudes signify future behavior and also have a filtering role in the processes of recognition. The personality forming influence of attitudes manifests itself during interaction in rational, emotional and behavioral domains (*Molnár*, 2009).

Attitudes are built up through knowledge about objects, emotional orientations and behavioral intentions, in other words, cognitive (knowledge), affective (emotional) and behavioral components (*Mező*, 2008; *Marlowe* and *Woodrow*, 1996; *Kaiser, Wölfing* and *Fuhrer*, 1999; *Flamm*, 2009; *Pruneau* et al., 2006). In an experimental context, the above listed components would be regarded as dependent variables (*Alp, Ertepinar* és *Tekkaya*, 2006).

Environmental attitudes indicate how a human relates to their surrounding environment (*Smit*, 2009). It can be either positive or negative. The former alludes to taking responsibility for the environment and also paying attention to it as well as minimizing the negative environmental impacts, while the latter alludes to negligence towards the environment and lack of value maintaining behavior (*Havas* and *Varga*, 1998).

Knowledge acquired about the environment cannot be defined as environmental conscious behavior (*Varga*, 2004). According to the knowledge-attitude-behavior model the acquisition of environmental knowledge might positively influence environmental attitudes and can also result in environmentally-conscious behavior.

A relevant issue of environmental education is that the knowledge of facts and attitudes are not adequate forecast for environmental conscious behavior and do not change the individual's relationship towards nature. Attitude is also a sensitive, varying cause, it is a consequence that

cannot exist on its own. Thus, it indirectly influences our behavior. So, it is not the examination and formation of attitude as a consequence are the objectives of research and education, but its direct determinations (*Varga*, 2004).

Attitude measurement is achieved through direct questioning or observation during which the research subjects' behavior is examined. Indirect methods can also be applied, i.e. research subjects are questioned regarding their conditions, i.e. their physiological anwers are assessed. An individual's verbal report regarding their attitudes, however, shows weak correlation with realistic behavior towards various subjects in question (*Mező*, 2008). Therefore, attitudes cannot be directly measures, only their manifestation which can be measured directly and indirectly, as well (*Dawes* and *Smith*, 1968, cited by *Molnár*, 2009). It is challenging to evaluate the success of environmental education through paper-pencil-based tests, which does not mean that its quality cannot be monitored and continuously developed (*Gulyás* and *Varga*, 2006).

Owing to the nature of environmental education, it tends to question the traditional forms and methods of education (*Hart*, 2010). Environmental education deals with facts, objectives, issues, possible solutions, models and values. These elements were present in education before, however separately within each subject. Environmental education integrates these elements. By doing so, it does not substitute or makes redundant all the other subjects, only incorporates them into one unit, expands their knowledge system, enlarges the pedagogical system of instruments as well as the didactical methods and systems with new modes of recognition and thinking (*Kostova* és *Atasoy*, 2008).

According to the basic principles of environmental education, children ought to explore the connections independently in order to achieve active acquisition through actions. One needs to acquire various average skills through adequate motivation (*Nahalka*, 2002). Instead of focusing on literacy, more emphasis should be put on competences, namely not the acquired knowledge, but the ability to act should be highlighted (*Kiss*, 2006).

Environmental education has an interdisciplinary feature (*Pace*, 2003), its content can be incorporated into various primary school subjects, even into civic education, subjects with their focus on natural sciences or into topics of extracurricular activities. Thus, there is a serious risk of knowledge transmitted by environmental education to fade away and dissolve through the various contents of several subjects. In order to avoid this issue, the realization of intensive

environmental education programs is necessary in addition to educational practices established so far (*Carleton-Hug* and *Hug*, 2010).

Environmental education programs can also provide various opportunities for the realization of interdisciplinary education as well as the traditionally organized environmental education system, with the exception that within the framework of the program, more intensive and enduring experiences as well as more complex knowledge enrich the mind of children (*Koutsoukos, Fragoulis* és *Valkanos*, 2015). The adequately organized programs positively influence children's attitudes towards the environment and result in environmentally-conscious behavior (*Dimopoulos, Paraskevopoulos* and *Pantis*, 2008; *Smith-Sebasto* and *Cavern*, 2006; *Ballantyne, Fien* and *Packer*, 2000). For the successful realization of the programs, however, teachers who dispose of adequate approach and knowledge are necessary who are also capable of evaluating the efficiency of their work and are willing to accommodate to an altered teaching environment (*Moseley, Reinke* and *Bookout*, 2002).

HYPOTHESIS AND METHODS OF THE EMPIRICAL RESEARCH

The objective system of the research

Scientific objective: empirical research aims to demonstrate that environmentally-conscious behavior can be taught, but apart from cognitive influences and requirements, educational domains, modern methods, thoroughly developed environmental education programs incorporated into the curriculum also play a crucial role.

Practical objective 1: the development of intensive, experience-oriented environmental education program that facilitates the promotion of environmentally-conscious behavior among junior section primary school pupils, enabling pre-service primary school teachers to successfully perform their environmental education duties and experimenting with various teaching methods during their teaching practice.

Practical objective 2: to examine the group of children participating in alternative education, to be specific who participate in an environment or environmental protection themed program, whether they prove to have a more environmentally-conscious behavior and show more positive attitudes towards the environment in comparison to children participating in traditionally organized education. The application of versatile educational domains, methods and contents can contribute to achieving the goals of environmental education, in other words, to provide evidence

that children educated in this program prove to be more prone towards actions in the interest of the environment.

Practical objective 3: to examine the environmentally-conscious behavior and environmental attitudes of students attending the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica before and after program realization.

Practical objective 4: to define the environmental attitudes and consciousness of pre-school and primary school teacher training students attending their university studies in Hungarian in Vojvodina through the analysis of the control group's research results throughout the year of research and its two consecutive years.

Methodological objective: the establishment of a program that contributes to the environmental education of pre-service teachers, i.e. students who also participate in the formation of the program as well as primary school pupils of junior section with the purpose of ensuring the efficient realization of sustainable pedagogy and environment education.

Hypotheses

I. The hypotheses concerning the empirical research conducted among teacher training students:

- H1: The degree of environmental consciousness among students who were participating in the establishment of the environmental education program (experimental group) increases following the establishment and realization of the environmental education program.
  - H1/a: compared to the results performed throughout a previous survey;
  - H1/b: compared to the values of the control group;
  - H1/c: based on the data measured by all three scales (ENV, RevNEP and CHEAKS).
- H2: The environmental attitude values of the control group are positive (Hungarian pre-service pre-school and primary school teachers in Vojvodina), i.e. the value is above neutral according to each scale (ENV, RevNEP and CHEAKS).
- H3: Background variables of teacher training students influence the degree of environmental attitudes among members of the experimental as well as control group.
- H4: The degree of pre-service pre-school and primary school teachers' environmental attitude values increases throughout the academic years of the research year.

II. Hypotheses concerning the empirical research conducted among pupils attending junior section of primary school:

- H1: The positive average values are shown regarding the environment attitudes of primary school pupils according to the survey conducted before the commencement of the program:
  - H1/a. in the experimental group;
  - H1/b. in the control group.
- H2: The environmental attitude values and environmentally-conscious behavior of primary school pupils who participate in the intensive, experience-based environmental education program developed by pre-service teachers is more positive following program participation than before:
  - 2a. in comparison to previously conducted research results;
  - 2b. in comparison to the values of the control group;
- H3: The environmental attitude value of primary school pupils who participate in the environmental education program is higher following the elaboration of the program topics (water, waste and energy) during the second survey.
  - 3a. in comparison to the previously surveyed results;
  - 3b. in comparison to the values of the control group;
- H4: Background variables of pupils attending junior section of primary school influence the degree of environmental attitude both in case of the experimental and control group as well.
- H5: Following the participation in the environmental education program primary school pupils view the causes and factors of environmental pollution more realistically than before:
  - 5a. in comparison to the previously surveyed results;
  - 5b. in comparison to the values of the control group.
- H6: Following the participation in the environmental education program primary school pupils are familiar with more own action/behavior possibilities in the interest of environment protection:
  - 6a. in comparison to the previously surveyed results;
  - 6b. in comparison to the values of the control group.

Research methodology

The analysis is based on the following elements:

1. the elaboration of an intensive, experience-oriented environmental educational program;
2. the analysis of value changes in the environmental attitude of students who participate in the elaboration of the environmental educational program, accompanied by a control group analysis;
3. the longitudinal survey (two consecutive academic years) of value changes in the environmental attitude of students who were members of the control group;
4. the analysis of value changes in the environmental attitude of junior section primary school pupils who participated in the environmental educational program, accompanied by a control group analysis.

The research results of both experimental groups of pre-service teachers and primary school pupils were compared to research results of the control groups respectively.

Measurement scales

A questionnaire was the research instrument consisting of 69 questions. The first 10 questions elicited background information of the informants, while the next 59 items were Likert-scale list of questions. They were adapted into Hungarian from three different, attitude questionnaires: the ENV, RevNEP and CHEAKS questionnaires. To sum it up, the questionnaire was compiled according to the following elements:

(1) 20 items of the ENV scale;

(2) 15 items of the RevNep scale;

(3) 24 items of the CHEAKS scale.

In the survey conducted among junior section primary school pupils, the environmental attitude measuring principles of Attila Varga were followed, i.e. his adaptation of CHEAKS (Children's Environmental Attitude and Knowledge Scale) (*Varga*, 2004). The questionnaire contained the following elements of the CHEAKS:

- The background information of respondents (age, gender, parental educational status, number of family members, financial status of the family, scholastic record, favorite subject);

- A 48-item 5-point Likert-scale that includes the following elements:
  - 24 questions related to the respondents' environmental attitudes;
  - 15 questions related to factors endangering the environment;
  - 5 questions related to the causes of environmental pollution.
- *Open-ended questions:* the analysis of the own possibilities regarding the decrease of environmental pollution.

The concise introduction of the environmental education program

The two-week-long, intensive environmental education program under analysis was realized between 11th and 23rd March, 2013.

14 pre-service teachers (students of the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica) with the involvement of primary school pupils attending 2nd, 3rd and 4th grades (N=216) realized the program in total in 11 primary school junior sections. Second grade pupils focused on the topic of water, third grade pupils on waste and fourth grade pupils on energy.

According to the methodological principles of environmental education the realization of the program elements was performed during regular classes and extra-curricular activities as well as on outside school locations.

RESULTS

Pre-service teachers' research results

- *Confirming H1 hypothesis:* the environmental attitude values increase among pre-service teachers who participated in the elaboration of the environmental education program.
  - *Confirming H1/a hypothesis:* according to the preliminary survey research results, the hypotheses can be confirmed in each subscale, except for 3 subscales of the ENV scale, 2 subscales of the RevNEP scale, and 2 subscales of the CHEAKS scale.
  - *Confirming H1/b hypothesis:* compared to the control groups' research results, the efficiency of the education program is approved based on the values of the a few subscales of the ENV scale, the majority of subscales of the RevNEP scale, and each subscale of the CHEAKS scale.

  - *Confirming H1/c hypothesis:* the hypothesis was rejected as it was not confirmed by each subscale of the applied scales.
- *Confirming H2 hypothesis:* there were subscales indicating negative values during the first data collection among pre-service pre-school and primary school teachers studying in Hungarian in Vojvodina both in case of the experimental and control group, as well. Thus, it cannot be obviously stated that the environmental attitude values are positive according to the values of the three scales.
- *Confirming H3 hypothesis:* correlation cannot be established with each background variable, however certain factors prove to play a role in the degree of environmental attitude values considering both the experimental and the control groups.
- *Confirming H4 hypothesis:* the educational system of the Hungarian Language Teacher Training Faculty regardless of the effects of the program is not unequivocally positively influenced the environmental attitude values.

Junior section primary school pupils' research results

- *Confirming H1 hypothesis:* the environmental attitude values of the junior section primary school pupils show a positive value before the commencement of the program during the preliminary survey.
  - *Confirming H1/a hypothesis:* each subscale and item of the control group showed a positive value.
  - *Confirming H1/b hypothesis:* in case of the control group, there was only one item that refers to a negative environmental attitude, but the average values of the subscales and the total scale indicated a positive attitude.
- *Confirming H2 hypothesis:* the hypothesis has not been confirmed. The environmental conscious behavior of pupils participating in the program did not show a more positive value following their participation in the program.
  - *Confirming H2/a hypothesis:* the environmental attitude values of pupils participating in the program did not show an increasing, but a decreasing tendency compared to the research results of the preliminary survey.
  - *Confirming H2/b hypothesis:* the values of the experimental group did not show any deviation from the control group.

- *Confirming H3 hypothesis:* the environmental attitude values of pupils participating in the program increases only in the modul of energy at the end of the program.
  - *Confirming H3/a hypothesis:* within the subscales of water and energy no significant change was detected, however regarding the average of the waste subscale items a decrease was detected between the two surveys.
  - *Confirming H3/b hypothesis:* considering the subscale of energy the hypothesis has been confirmed that the environmental attitude values of pupils participating in the program increased compared to the control group.
- *Confirming H4 hypothesis:* with reference to the background variables of pupils, it can be concluded that in several cases the background variables influenced the environmental attitude values both in case of the experimental and the control group.
- *Confirming H5 hypothesis:* out of 15 factors 4 while out of 5 causes 4 were confirmed, to be specific pupils participating in the program were able to observe the causes and factors of environmental pollution more realistically.
  - *Confirming H5/a hypothesis:* with respect to the issues of environment protection, over-population, industry and air pollution pupils had a more realistic view at the end of the second survey.
  - *Confirming H5/b hypothesis:* during the first survey difference in case of 2 factors could be detected, following the second survey there were 5 factors in which pupils provided a more precise account in comparison to the members of the control group.
- *Confirming H6 hypothesis:* the present hypothesis has not been confirmed, i.e. pupils participating in the program did not dispose of more options of action for the purpose of environment protection.
  - *Confirming H6/a hypothesis:* there is no considerable difference considering pupils' own realization in their options for action among neither members of the experimental nor control group.
  - *Confirming H6/b hypothesis:* there is no considerable difference in the experimental and control groups' research results.

SUMMARY

The present thesis provides an analysis upon the environmental attitudes of pre-service teachers and junior section primary school pupils. The analysis of the two target groups was based on an experimental educational program which was designed and realized by students while pupils were its participants. The fundamental objective of the program is the common development of environmental attitudes of both target groups. The program also provided an opportunity for pre-service teachers to widen their knowledge and skills of teaching environmental education. While pupils had the opportunity to familiarize with activity and experience-oriented opportunities for action as well as versatile educational domains were ensured.

The relevancy of the research originates from the fact that the Serbian educational system does not offer any adequate opportunities for the implementation of environmental education into the curriculum. While, according to the current viewpoint of the pedagogy of sustainability, there is an urgent need for making up for the shortcomings.

The research results of the empirical survey conducted among pre-service teachers proves the successfulness of the program. Thus, it is worth further developing the environmental-conscious behavior of students and providing further means in order to face the new pedagogical challenges of environmental culture development.

With respect to the junior section primary school pupils, the successfulness of the program is not confirmed from each aspect of analysis. The latter survey results show a decreasing tendency which implies the presence of distortional factors of the informants that influence the efficiency of the CHEAKS questionnaire. Thus, the efficiency of the environmental educational program cannot be unequivocally rejected. Certain results of the research highlight the positive influence of the program, which indicate the necessity to further develop various elements of the program and following its modification introduce the intensive, experience-based environmental education program among junior section primary school pupils.

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