

ABSTRACT

This study presents the results of a two-leveled research. The investigation comprises of the development of an intensive environmental education program and its realization. Two different target groups were involved into the developmental and realization segment of the program, to be specific teacher training students and lower-grade primary school pupils. The present paper explores the first research segment, i.e. the environmental attitudes of teacher training students, the development of the environmental education program and its realization which will be compared to the data gained during the second segment of the research. The results will provide insight into the program's efficiency among teacher training students.

Keywords: environmental education, teacher training students, environmental attitudes

ÖSSZEFOGLALÓ

Munkámban egy kétlépcsős kutatás eredményeinek bemutatására kerül sor. A kutatás alapját egy intenzív környezeti nevelési program kidolgozása és végrehajtása képezi. Két célcsoport kerül bevonásra: a programot megtervező és kivitelező tanítóképzős hallgatók, valamint a programban résztvevő alsó tagozatos diákok. Tanulmányomban a tanítóképzős hallgatók környezeti attitűdjére vonatkozó alapállapotok, vagyis az első mérés során kapott adatok és a környezeti nevelési program kidolgozását és végrehajtását követő második mérés során kapott adatok összehasonlítása történik. A kapott adatok a program hatékonyságát igazolják a tanítóképzős hallgatókra vonatkozóan.

Kulcsszavak: környezeti nevelés, tanítóképzős hallgatók, környezeti attitűd

REZIME

U ovom radu biće prikazani rezultati jednog dvostepenog istraživanja.

Osnovu istraživanja predstavlja realizacija i razvoj jednog intenzivnog programa ekološkog obrazovanja.

Uključene su bile dve ciljne grupe. Prvu grupu su predstavljali studenti Učiteljskog fakulteta, koji su pripremili i realizovali program, a drugu grupu su činili učenici nižih razreda koji su učestvovali u programu.

Moja studija predstavljaosnovno stanje, to jest odnos studenata Učiteljskog fakulteta prema životnoj sredini. Prikazani su rezultati nakon prvog merenja i njihovo upoređivanje sa rezultatima drugog merenja, koji su dobijeni nakon izrade programa ekološkog obrazovanja i njegove realizacije.

Dobijeni podaci potvrđuju efikasnost programa koji se odnosi na studente učiteljskog fakulteta.

Ključne reči: ekološko obrazovanje, studenti Učiteljskog fakulteta, stav prema životnoj sredini



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THE ANALYSIS OF ENVIRONMENTAL ATTITUDES AMONG TEACHER TRAINING STUDENTS

*Tanítóképzős hallgatók környezeti
attitűdjének vizsgálata*

*Ispitivanje odnosa i stava studenata
Učiteljskog fakulteta prema ekologiji*

1. Environmental Education and Attitudes

Our behavior, acts, lifestyle toward the environment are defined by our attitudes, which are psychological products, the spirals of mental life, connecting reasons with acts and their values (Havas, 1993).

The basic role of environmental education is to develop environmental consciousness, the development of environmental friendly behavior, formation of attitudes and values as well as the widening of knowledge related to the environment and society (Mikházi, 2006; Thiengkamol, 2011).

During environmental education not the transfer of basic knowledge is taking place, but the formation of attitudes (Lehoczky, 1998). In addition, various high level skill developments are realized, such as critical thinking, creativity, ability to integrate and problem resolution since environment education raises problems should be analyzed and simulated (Fűzné Kószó, 2002). Thus, environmental education requires experience based pedagogy and activity based methods that enable learners to actively participate in the process of teaching-learning. The application of the method, however, requires a change in point of view, to be specific knowledge-based education should be replaced with activity-based education, i.e. the goal should be acquiring knowledge that is applicable in every day practices.

The application of environmental education program ensures an intensive, long-term, complex knowledge. The adequately organized knowledge positively affects the environmental attitudes of children and their environmental conscious behavior (Dimopoulos-Paraskevopoulos -Pantis, 2008; Smith-Sebasto-Cavern, 2006; Ballantyne-Fien- Packer, 2000).



2. Research goal

During the present research an environment education program has been planned and developed by students of the Hungarian Language Teacher Training Faculty in Subotica.

Its target group was the pupils of lower grade primary school. The primary goal of the environment education program is to develop pupils' as well as pre-service teachers' responsibility towards their environment.

The purpose of the present study is to introduce the environmental attitudes of students.

3. Methodology

The CHEAKS (*Children's Environmental Attitude and Knowledge Scale*) served the basis for the analysis of environmental attitudes (Varga, 2004). The present study analyzes three parts of the questionnaire:

(1) Survey participants' social background (e.g. age, parents' educational background, scholastic record, etc.)

(2) 5 point Likert-scale consisting of 48 items including the following:

a. 24 questions regarding the environmental attitudes of the survey participants

b. 15 questions regarding the factors that endanger the environment

c. 5 questions regarding the reasons of environmental pollution

d. 4 questions regarding the factors that influence the subjects' environment consciousness

(3) The survey participants were required to list environmental and nature protective activities that reduce environmental pollution.

4. Device

The students of the Hungarian Language Teacher Training Faculty participated in the elaboration and realization of the program titled *Experience-based Environmental education* between the 11th and 23rd of March, 2013. The two-week-long program aims to develop the environmental conscious behavior of teacher training students and lower grade primary school pupils. During a two-week-long period, each class processes a unit of the program. 2nd grade pupils deal with water protection, 3rd grade pupils with the issue of waste while 4th graders discuss the topic of energy consumption.

5. Sample

The research participants can be divided into two groups:

(1) *Experimental group* ($N=14$): University of Novi Sad, Hungarian Language Teacher Training Faculty, Subotica, 4th-grade pre-service teachers;

(2) *Control group* ($N=11$): University of Novi Sad, Hungarian Language Teacher Training Faculty, Subotica, 4th-grade pre-service kindergarten teachers.

5.1. The participants' social background

Experimental group (N=14):

- a.) *Age*: the participants' age ranges from 21 to 24. Age average: 22.36 years;
 b.) *Sex*: the 7.1% of the participants were men (1 person), 92.9% (13 people) were women;
 c.) *Place of residence*: the subjects' 64.3% lives in villages;
 d.) *Parents' scholarly background*: regarding the fathers' highest educational level, in 71.4% of the cases it was secondary school. In 57.1% of the cases the mothers' highest educational level was secondary school;
 e.) *The families' social background*: the majority of the subjects live in households of four members (50%), the financial status of the families, according to the majority of the subjects, is average (71.4%);
 f.) *Scholarly records*: the average of the students scholarly records was 8.40. The minimum was 7.75, while the maximum 9.80.

Control group (N=11):

- a.) *Age*: the minimum age is 21, maximum is 23. Age average: 22.00 years;
 b.) *Sex*: the 9.1% of the participants were men (1 person), 90.9% (10 people) were women;
 c.) *Place of residence*: the control group's 45.5% lives in villages;
 d.) *Parents' scholarly background*: the parents' highest educational level is mostly secondary school, as for the fathers' ratio 57.1%, as for the mothers' 54.5%;
 e.) *The families' social background*: the majority of the control group's subjects also live in four-member households (54.5%), their financial status is average according to the 81.8% of the subjects;
 f.) *Scholarly records*: regarding the control group, their average of scholarly records was 8.20. The minimum was 7.50, the maximum 9.00.

Table 1.			
Parents' scholarly background			
		Experimental group (N=14)	Control group (N=11)
Father's highest level of education	a. Primary school	14.3%	36.4%
	b. Secondary school	71.4%	45.5%
	c. College/university	14.3%	18.2%
Mother's highest level of education	a. Primary school	14.3%	27.3%
	b. Secondary school	57.1%	54.5%
	c. College/university	28.6%	18.2%

Table 2. The families' social background			
		Experimental group (N=14)	Control group (N=11)
Subjects who live in one household	2 people	0%	9.1%
	3 people	28.6%	18.2%
	4 people	50.0%	54.5%
	5 people	21.4%	18.2%
The households' financial status	a. Bad	14.3%	9.1%
	b. Average	71.4%	81.8%
	c. Good	14.3%	9.1%

6. Results

6.1. The environmental attitudes of the students

The next section of the questionnaire consisted of 24 items which were designed to reveal the environmental attitudes of the students. The questions targeted at revealing the students' attitudes regarding ordinary environment topics, animals, plants, water, energy and waste, as well as their emotional and behavioral relation to the environment.

The analysis of the data from the first survey reveals that the subjects (either the experimental or the control group) have positive attitudes towards the environment. Both the experimental and control groups are mostly interested in issues such as plants and water. The experimental group less interested in the issue of energy, and the control group showed less interest in the issues of animals.

Concerning the emotional and behavioral attitudes both the experimental and control groups showed positive values and the ratio of their answers was also equal. The emotional motivation of both groups is high, however behaviors on behalf of environmental protection proves to be poor among the students. Thus, on the basis of the results, it can be seen that Environment Education needs to enlighten students regarding the activities that they can perform on behalf of the environment.

The total environmental attitude scale of the results concerning both groups is highly above the neutral value, i.e. is in the positive value range.

The second segment of the research was realized following the completion of the environmental program. Considering the data of the experimental group on each scale increase can be noticed, while regarding the data of the control group decline on each scale can be observed. As for the experimental group's attitude scale values the Paired Samples T-Test showed significant increase ($p=0,02$ $t=-2,6$). Energy ($p=0,01$ $t=-5,79$) and emotion ($p=0,05$ $t=-2,1$) subscales also show a significant increase.

The comparison of the experimental and the control group results during the second research segment reveals significant differences in emotions ($p=0,02$ $t=5,02$).

Table 3. The environmental attitudes of students												
ATTITUDE SCALES	Experimental Group (N=14)						Control Group (N=11)					
	Time 1		Time 2		Change		Time 1		Time 2		Change	
	Mean	Std. deviation	Mean	Std. deviation	Change	Mean	Std. deviation	Mean	Std. deviation	Change	Mean	Std. deviation
PLANTS	17.1	2.2	-	-	-	17.7	1.7	-	-	-	-	-
WATER	16.2	2.6	17.6	0.7	increase	17.6	1.7	15.3	1.7	decrease	15.3	1.7
WASTE	15.8	2.2	16.6	0.5	increase	17.3	1.7	15.6	2.1	decrease	15.6	2.1
ANIMALS	15.6	2.5	16.9	0.5	increase	14.9	3.3	13	3	decrease	13	3
AVERAGE	14.9	2.6	15.7	0.6	increase	15.1	2.4	12.5	1.8	decrease	12.5	1.8
ENERGY	14.2	3.5	18.4	0.6	increase p=0,01	16	2	15.7	1.9	decrease	15.7	1.9
POLLUTION	-	-	14.3	0.5	-	-	-	11.7	1.5	-	11.7	1.5
BEHAVIOR	44.0	6.3	46.7	5.8	increase	47.1	4.7	41.2	5.8	decrease	41.2	5.8
EMOTION	50.0	5.5	52.9	6	increase p=0,05	51.7	6.6	42.7	4.1	decrease	42.7	4.1
TOTAL SCALE	94.0	10.9	99.7	10.4	increase p=0,02	98.8	10.6	84	8.7	decrease	84	8.7
Cronbach's alpha	$\alpha = 0.77$		$\alpha = 0.85$			$\alpha = 0.88$		$\alpha = 0.79$				

On the basis of the research results it can be concluded that the program positively affected all the attitudes of the experimental group, i.e. notable change towards the environment is detected among the group members who participated in the program in contrast with those who did not.

The data analysis of the two groups is demonstrated in *Table 3* (in descending order taking into consideration the experimental group's results).

6.2. The analysis of students' views upon the factors that endanger the environment

The following section of the questionnaire aimed to reveal the factors that students believe are dangerous for the environment. On a scale from one to five, one means that the activity does not pollute the air, while five means that the activity in question highly pollutes the environment. The various factors are listed in the order of dangerousness on the basis of the students' judgment.

During the first survey both the experimental and control groups consider air pollution to be the most dangerous, while nature protection to be the least dangerous activity. Regarding the judgment of the other factors, differences can be noticed between the two groups' opinions.

During the second survey the members of the experimental group considered various factors to be more destructive to nature in comparison to the control group except for environment protection and water hydroelectric power plants. In addition, the control group also undervalued the negative effect of nuclear power stations and acid rains in comparison to the first survey.

Paired Samples T-Test result show significant difference in the judgment of agronomy ($p=0,01$ $t=-5,1$) as well as smoking ($p=0,05$ $t=-2,1$) regarding the first and second surveys. In addition, upon comparing the first and the second survey results noticeable discrepancy can be detected considering the total environmental polluting factors on each scale ($p=0,01$ $t=-2,7$).

This means that during the realization of the environmental program the above mentioned two topics and the pollutant factors were successfully acquired by the students. *Table 4* shows the results of students' opinions upon the factors that pollute the environment.

6.3. The analysis of views regarding the reasons of environmental pollution

The following five factors refer to the causes of environmental pollution. The causes were ranked on a five-tone scale by the students. Value one means that the cause in question is not so relevant while value five means that the cause in question is a cause of environmental pollution.

Table 4. The evaluation of factors that pollute the environment																
ENDANGERING FACTORS	Experimental Group (N=14)						Control Group (N=11)									
	Time 1			Time 2			Change			Time 1			Time 2			Change
	Mean	Std. dev.	Std. dev.	Mean	Std. dev.	Std. dev.	Mean	Std. dev.	Std. dev.	Mean	Std. dev.	Std. dev.	Mean	Std. dev.	Std. dev.	Change
Environment protection	1.6	1.1	0.8	1.3	0.8	0.8	decrease	1.3	0.5	0.5	1.1	1.1	0.3	0.3	decrease	
Agricultures	2.6	0.9	0.9	3.9	0.9	0.9	increase p=0,01	2.8	1.5	1.5	3.8	1.1	1.1	1.1	increase	
Water power station	3.5	0.9	1.5	3.1	1.5	1.5	decrease	3.4	0.8	0.8	3	1.5	1.5	1.5	decrease	
Mining	3.6	1	1.1	4	1.1	1.1	increase	3.7	0.6	0.6	3.9	0.8	0.8	0.8	increase	
Water pollution	3.7	1.7	0.6	4.6	0.6	0.6	increase	4.5	1	1	4.8	0.4	0.4	0.4	increase	
Traffic	3.8	1	0.5	4.7	0.5	0.5	increase	4.2	0.6	0.6	4.6	0.5	0.5	0.5	increase	
Over population	3.9	1.1	0.5	4.4	0.5	0.5	increase	4.3	1.2	1.2	4.6	0.5	0.5	0.5	increase	
Soil erosion	3.9	1	1.3	3.9	1.3	1.3	equal	3.9	1	1	4.4	0.7	0.7	0.7	increase	
Nuclear power station	4.1	1.2	0.8	4.5	0.8	0.8	increase	4.5	0.7	0.7	4.3	0.8	0.8	0.8	decrease	
Industry	4.2	1	0.8	4.4	0.8	0.8	increase	4.4	0.7	0.7	4.4	0.7	0.7	0.7	equal	
Acid rain	4.3	1.1	0.4	4.8	0.4	0.4	increase	4.2	0.7	0.7	4.7	0.5	0.5	0.5	decrease	
Street waste	4.3	1.3	0.8	4.6	0.8	0.8	increase	4.8	0.4	0.4	4.9	0.3	0.3	0.3	increase	
Smoking	4.4	0.6	0.4	4.9	0.4	0.4	increase p=0,05	4.5	0.7	0.7	4.7	0.5	0.5	0.5	increase	
Deforestation	4.4	1.1	0.4	4.8	0.4	0.4	increase	4.3	1.3	1.3	5	0	0	0	increase	
Air pollution	4.6	0.6	0.4	4.8	0.4	0.4	increase	4.9	0.3	0.3	4.9	0.3	0.3	0.3	equal	
Cronbach's alpha	$\alpha = 0.68$			$\alpha = 0.73$			$\alpha = 0.72$			$\alpha = 0.7$						

During the first survey students believed that primarily humans and their selfish behavior can be blamed for environmental pollution, and both groups agreed that only adults cause pollution.

During the second survey the members of the experimental group named over-consumption to be the major reason for environmental problems. The judgment of this factor showed significant increase in comparison to the first survey: Paired Samples T-Test results ($p=0,04$ $t=-3,5$). Decrease can be noticed regarding the judgment of all the other pollutant factors upon comparing the experimental and control groups. Three new factors were introduced during the second survey: lack of information, irresponsibility of the factories and the satisfaction of human life necessities. Both groups rated the three factors with similar values: as for lack of information average of 4.4, the ratings for the irresponsibility of the factories was higher amongst the control group members, while those for the satisfaction of human life necessities were higher amongst the experimental group members (Table 5).

THE REASONS OF ENVIRONMENTAL POLLUTION	<i>Experimental Group</i> (N=14)				Change	<i>Control Group</i> (N=11)				Change
	Time 1		Time 2			Time 1		Time 2		
	Mean	Std. dev.	Mean	Std. dev.		Mean	Std. dev.	Mean	Std. dev.	
Selfishness of humans	4.6	0.6	4.6	0.5	equal	4.6	0.5	4.7	0.5	decrease
Purposeful pollution	4.1	0.8	3.8	0.6	decrease	3.8	1.5	4.1	0.6	decrease
High consumption	3.8	1.1	4.7	0.5	increase $p=0,04$	4.4	0.6	4.4	0.9	equal
Poverty	2.8	1.2	2.6	1.1	decrease	2.1	1.2	2.1	1	equal
Adults	2.1	1.3	1.9	1.4	decrease	1.3	0.5	1.4	0.7	decrease
Ignorance	-	-	4.4	0.5	-	-	-	4.4	1.2	
Companies	-	-	4	0.5	-	-	-	4.4	0.5	
Life needs	-	-	4.2	0.6	-	-	-	3.6	1.2	

6.4. Factors that influence environment consciousness

The following four questions aimed to map out the factors that influence the subjects' environment consciousness.

The first results show that in case of the experimental group the highest motivation for environmental protection was generated by keeping a pet that they were attached to and fond of. In case of the control group, however, Education Environment taught at school

provides the biggest motivation for environmental protection. Among the subjects of the experimental group school education, nature documentaries and scientific literature bears the same motivational power for environmental protection and the least motivating power for environmental protection is home selective waste collection of garbage. In case of the control group the least motivating factors are nature documentaries and scientific literature (*Table 6*).

Table 6.
1. First survey: Factors that influence environmental consciousness (Major, 2013)

THE REASONS OF ENVIRONMENTAL POLLUTION	<i>Experimental Group</i> (N=14)		<i>Control Group</i> (N=11)	
	Mean	Std. dev.	Mean	Std. dev.
Pet (house environment)	4.6	1	4.6	0.9
School education	4.6	0.9	4.3	1.1
Nature documentaries	4.1	1.4	3.9	1.3
Selective waste collection	3.8	1.5	3.7	1.5

During the second survey two new questions were added to the questionnaire instead of the four items listed in the first survey. Both questions aimed to provide an insight into the role of parents and home in environmental attitude formation. Results reveal that according to the participants of the survey parents and home have a crucial role in environment attitude formation. Though, the experimental group considers this role to be more important than the members of the control group. The variance shows no significant difference on the basis of the Independent Samples T-Test (*Table 7*).

Table 7.
2. Second survey: Factors that influence environmental consciousness

THE REASONS OF ENVIRONMENTAL POLLUTION	<i>Experimental Group</i> (N=14)		<i>Control Group</i> (N=11)	
	Mean	Std. dev.	Mean	Std. dev.
Home environment	3.21	1.2	3	1
The role of parents	3.7	0.9	3.6	0.9

6.5. Noticing one's own possibilities of decreasing environmental pollution

The third section of the questionnaire the subjects were required to list their own opportunities to reduce environmental pollution. Out of 14 members of the experimental group, 13 subjects responded that they had various possibilities to act environmental friendly. 1 subject answered that he/she had no possibility to reduce environmental pollution.

The results of the second survey lead us to the same conclusion, i.e. during the program students were not convinced that they could also actively contribute to and participate in environmental protection.

Listing the possibilities of environmental protection reduction was an open-ended question. The possibilities mentioned by the subjects were categorized, which is demonstrated in *Table 8*.

Table 8.
Concrete possibilities to reduce environmental pollution

POSSIBILITIES	<i>Experimental Group</i> (N=14)			<i>Control Group</i> (N=11)		
	Time 1	Time 2	Change	Time 1	Time 2	Change
	Frequency	Frequency		Frequency	Frequency	
Selective collection of garbage	10	12	increase	12	10	decrease
Avoiding littering	6	7	increase	5	3	decrease
I do not waste water	6	6	equal	3	8	increase
I do not waste electricity	5	10	increase	6	5	decrease
Setting and example, e.education	5	3	decrease	2	4	increase
Walking, public transport	5	5	equal	3	4	increase
I pay attention to my environment	4	0	decrease	3	2	decrease
Plant protection	2	2	equal	1	2	increase
Community work	2	0	decrease	4	0	decrease
Recycling	1	1	equal	3	4	increase
Widening one's knowledge about environm.	1	0	decrease	0	1	increase

The most frequently mentioned possibility to reduce environmental pollution in the first time was selective collection of garbage in both groups. Sparing energy (water, electricity) or setting an example were also regarded as crucial among students when teaching Environment Education.

The second survey reveals that selective waste collection, reduction of littering as well as energy and water efficiency were the most frequently mentioned ways of environment protection by the members of the control group. These topics were discussed during the program as well.

7. Summary

Regarding the starting status of the two groups the environmental attitudes of the subjects is positive taking into consideration each scale.

Upon comparing the first and second surveys positive values considering most scales, except for the control group's subscale of pollution in which case the average values did not reach the neutral 12 points.

Regarding the control group survey results each subscale showed an increasing tendency while the control group's results showed a decreasing tendency when comparing the average values of subscales.

In case of the control group significant increase can be observed considering the whole environmental attitude scales as well as the subscales measuring energy and emotion. Upon the comparison of the two groups' values the program proved to have a positive influence in environment attitude formation.

It can be concluded that following the realization of the program considerable change in environmental attitudes among teacher training students.

Those students who participated in the experimental program judged various factors affecting the environment more realistically in comparison to the control group.

It has also been revealed that home as well as parental opinions and example play a crucial role in children's environmental attitude formation.

Also as an influence of the program and as an outcome of its realization the range of possible activities that might be performed by the students themselves towards environment protection has considerably widened.

The influence on children who participated in the program will be analyzed later on, however, in light of the results gained so far the *Intensive environment educational program* can be considered successful among teacher training students.

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