

Thesis of Ph.D. dissertation

Landscape ecological relations of the changing land usage in the mountainous region of Keszthely as well as the application of their generalized experiences in secondary schools and higher education

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The reasons of the research in the thema, aims of research

The mountainous region of Keszthely reacted always sensitively to the activities of man in land use and area usage. This is intensified by the nearness of Lake Balaton and by the considerable rate of afforestation (presently 41 %). This dissertation includes also the presentation of natural condition of the „Ex lege” protected moor area of Vindornya, since it is directly connected to the Keszthely-mountain region.

Changes in landscape usage in the past decades became subjects of sciences, among them of interdisciplines of teaching and education.

The aims of the research: complex investigation on successive relations going on the landscape creating factors on existing and left off area usage - among them the area of Várköly area in details – and all these connected to the special elements of the environment pedagogy of secondary schools and higher education. First representation will be given on the ecological changes of the Keszthely-mountains in the past 20-25 years with special respect to the effects of chemical usage. Using the synthesis of the above mentioneds the aim of this dissertation is to know: What and how appear the generalizable research results of landscape usage in Keszthely mountains region and how were they introduced to the present practice of secondary school and higher education. What is typical in the practice of environment-pedagogy? For this the thematically-oriented investigation results of the newly organized local vocational training has been detailed in this work. An important part of the work was to see how appears the environmental education in the study circles and in the exam requirements.

One of the most important subject of development – attached also to this work – is to see, that the different study organization methods what like influence have to the students, to teachers and other partners and that the pedagogical valuation of these how can contribute to increasing level of education.

Methodologically the aim was to show whether can the synthesis of the pedagogical-, the general-, and the natural-scientific methods successfully be applied in the practice?

Methods and means of the investigations

Landscape usage

The forms and ecological affects of landscape usage on the mentioned area were compared in 1985 and 2009, especially the situation of Várköly village. Data of arable land, loan, wine gardens, fruit gardens, kitchen gardens, forest and of uncultivated lands (fallow) were collected. These data of surface covering and its quality were completed by collecting data by structured interviews at community offices and at the area controlling office at Tapolca. A topographic map of 1:10.000 were used for the field observations and another one of 1:50.000 for the observation of the whole investigated area. The changes in the agricultural branches of cultivation are recorded for the years 1985 and 2007 using GIS information system.

Another important group of methods applied were the document analysis and the interviews. Verbal informations by the agronomists of the villages and former presidents of co-operatives could be successfully used as control informations in the informations.

Most of the investigated documents were kindly handed over by the area control offices of Keszthely and Tapolca, by mining offices, local and national water-use regulation offices, by fire departments, by services of forestry as well as by the National Office of Statistics. Also farmers helped me by giving data of spray diaries, field register books to be able to check the amounts of chemicals used for plant protection and mineral fertilizing.

Personal and group-type unstructured interviews have been made with private farmers, members of the leading staff of Várköly, as well as studies of settlement organization plan and regulation plan of the village.

Surface water amount measurements were made using calibrated „15 litre measure pails”. The area rate of acacia (*Robinia pseudoacacia*) and idol-tree (*Ailanthus altissima*) and their changing rate were investigated based on working plan documentations of forestry company of the southern part of Keszthely mountains.

The results of investigations in form of tables and figures are included in the dissertation, in some cases the causal relations

and proposals are also included. Photographs illustrate the localities and places of investigations.

The **methodology of investigations on environment education** was conducted as follows:

Research strategy: inductive, relation mapping procedure

Type of research: action research and program research

Sample size: 1000 teachers and students of secondary and higher schools, in 22 institutions

Sampling: single randomized, and strata, respectively.

Methodology and means: document analysis, based on the basic documents of the schools and considering the concerning local rules of environment education (EE).

- Analysis of sphere of activity of the teachers responsible for EE, with DACUM method, including 45 persons.
- Textbook investigations
- Analysis of trade modules in cases of timber industry (11), printing industry (12), management (16), and tourist industry (18) using the new descriptions of National Education List (OKJ) of the Central Program (KP), and of Trade and Exam Requirements (SzVK).
- Brainstorming for the possible introduction and using of EE in the trade education with the participation of school directors, teachers, advisors of Institute for Trade Education and Development (NSzFI), in which 176 persons took part.
- Attitude motivation and fundamentals measuring by using own-made question form and with a sample of 1000 persons.
- Adapted Likert type attitude question form to summarize and complete the content of investigation, for which 276 answers arrived from the students. Own made question form for teachers and students, 876 answer arrived to. In case of question forms the rate of acceptance was 70 % (at all the tests).
- Structured and unstructured interviews with students, unstructured interviews with teachers and leading persons with the participation of 96 persons to correct the attitudes.

Summary

The dissertation proved, that a synthesis of the different research methods of natural sciences and of social sciences could be achieved in our work in case of landscape usage and of environmental education in the selected thema: landscape usage and environment education.

It proved to be applicable method the own-made questionnaire (mainly to get single-dimension and multi-dimension data) and also the structured and unstructured interviews in connection with the numericalled and generalized results of field investigations.

A complex recognition of landscape usage and environment damaging effects has been achieved at the Keszthely-mountain-area and especially at Várvolgy village. As regard landscape usage, typical is the closing down of big agricultural co-operatives and the formation of smaller estates. In the agrar branches considerable decreased the area of wine plantages, fruit gardens and arable fields, and increased the area of kitchen gardens and of fallows. The number of livestock of all species sharply decreased, a slight increase can be observed in case of horses. The eco- and bio-production stagnates. Environment damaging chemicals in the agrarproduction was caused earlier by overdosing of mineral fertilizers, nowadays it comes from chemical plant protection, mainly by herbicide effects.

Shallow mining caused in many cases irreversible environment damages, just like as liquidated military establishments, and since no recultivation followed them, frequently illegal waste depot has got form there.

The few agricultural and other fires did not cause the global warming up. Other, new environment pollution sources are chemicals and solid wastes as a consequence of rescue after accidents or technical problems. Their importance is still not topic of consciousness.

The water measurements have shown that in case of running waters and sources the water amounts well correlated with the actual precipitation.

The investigations on spreading of invasive, not desirable tree species have shown that the acacia (*Robinia pseudoacacia*) and idol-tree (*Ailanthus altissima*) have spread quickly and occupied a considerable area.

With regard to the situation of education in environment protection our investigations allow to draw the following statements:

- Regarding landscape usage only two topics can be found in the teaching programs: „Condition of surface waters”, and „Arising of wastes and their treatment”.
- Landscape-type approach can be found in some EE programs and forest visiting programs only. However typical is the global approach in the school-books and in the teaching methodology of teachers.
- The innovations of teachers and the dimension of EE attitude are the dominant elements of the applied environment pedagogy.
- More and more arose the demand by school owners and leaders to measure and evaluate the level of pedagogy. The teachers however demand better books, more correct definitions of concepts and requirements. There is a demand also to have after-school instructions.
- The investigated institutions do not apply yet all the local possibilities in the motivation.
- On national level not all possibilities of the newly structured trade education has been exploited to achieve a higher level of environment education.

Scientific results

1. **First time has been shown the generalized experiences on changes in landscape usage of the Keszthely mountain region in the last 20-25 years in connection with the investigated environment pedagogy in the secondary schools and higher education. During the research it has been taken into consideration the newly introduced, but not yet evaluated competence-based modul-structured education.**
2. **Systematized and the whole process showing proposals has been elaborated to decrease environment damage/pollution for the Keszthely-mountain area.**
3. **Basic and situation revealing research results are included in the dissertation about the spread of the two invasive tree species: acacia (*Robinia pseudoacacia*) and idol-tree (*Ailanthus altissima*) during the time period of 1974 to 2004.**
4. **Using the adaptation of DACUM method it has been elaborated the scope of duties of a pedagogue in EE, who teaches it not as his main subject. During this it has been shown the complexity of subject integration.**
5. **The synthesis of pedagogical-, general-, and natural-scientific research methodology proved to be successful applicable in the praxis. This also increased the level of this dissertation in its content and methodology.**
6. **A database complex has been elaborated to fill the gap in the research of landscape usage of Keszthely mountain region and of local trade education, which basically changed after 2006 in some special topics.**
7. **Using the results of this research, structured methodological materials has been elaborated in the National Institute of Trade Education and Development for different trade groups and qualifications.**
8. **The dissertation proves, that neither concept, nor content of the environment competency are properly determined in the national provision of law, consequently in the competence based trade education.**
9. **Very low is the number of thema connected to landscape-environment education in the local programs and syllabus of courses.**

Publications

Scientific dissertations, written examinations

- Petrovics I. (2002): A tájökölógiai szemlélet megjelenése a környezeti nevelésben, a közoktatásban használt tankönyvek hatásvizsgálata alapján. (Landscape-ecological attitude in the environment education based on effectivity tests of books used in the public education). Eredmények és kihívások a Szakmai Tanárképzésben. NYME, Sopron.
- Petrovics I. (2003): A környezeti nevelés módszere és eszköztára. (Methods and means of environment education). IX. kerületi Pedagógiai Szolgáltató Központ konferencia. Budapest.
- Petrovics I. (2032): Kemikáliák a Környezetileg Érzékeny területeken. (Chemicals on environmentally sensitive areas.). Doktori szigorlat. NYME, Sopron.

Scientific essays

- Petrovics I. (2000): A „Szentháromság” jövőképe az ökofilozófiában. Ökológia – Természet – Környezet. (The image of future of „The Holy Trinity” in the ecophilosophy. Ecology- Nature – Environment). In: A pedagógiai szolgáltatás 30 éve Somogyban. (szerk.: Petrovics I.). Megyei Pedagógiai Intézet, Kaposvár.
- Petrovics I. (2005): A Faipar szakmacsoport záróvizsgálata a szakmai alapozó csoportban. (Closing exam of students trade group in the basic education of timber industry). SzakMa, Budapest.
- Petrovics I. (2007): Tájhasználat és kemikáliák az Érzékeny Természeti Területeken. (Landscape usage and chemicals on environmentally sensitive areas). MTA VEAB, Székesfehérvár. Európa Unió küszöbén.

- Petrovics I. (2007): Az ötvenes szintű szakképesítések kompetencia mérésének módszerei. (Methods of competence measuring in qualifications of fifty point level). NSZFI, Budapest.

Research results connected to thema

- Petrovics I. (2000): A somogyi iskolai munkakultúra mérése nemzetközi összehasonlítással. (Measuring of working culture in schools of county Somogy, with international comparison). In: A pedagógiai szolgáltatás 30 éve Somogyban (szerk. Petrovics I.). Megyei Pedagógiai Intézet.
- Petrovics I. (2004): A környezeti nevelés és a tájökológia „zászlóshajói” az oktatáspolitikai vizén. (The „flagships” of environmental education and landscape ecology on the water of education policy.). Oktatáspolitikai szemléletváltás Európában a XX. Században konferenciára. Székesfehérvár, 2004. október 28.
- Petrovics I. (2007): A pedagógiai mérés-értékelés, beszámíthatóság a szakképzésben, kiemelve a környezeti nevelés rendszerét. (Measuring and evaluation in the pedagogy, responsibility in the trade education with special respect to the system of environmental education). NSZFI, Budapest.
www.nive.hu/rendezvenyek.

Scientific communications and methodology

- Petrovics I. (1992): Válgjon valóra! A kollégiumi környezeti nevelésről. (Be realized! About environment education in student homes.) Keszthely és Vidéke, Keszthely.
- Petrovics I. (1997): Pedagógiai problémák, utak a változó világban, holisztikus szemlélettel. (Problems of pedagogy, ways in the changing world with holistic

- views). Alternatív Közgazdasági Gimnáziumok Országos Konferenciája, Budapest.
- Petrovics I. (2000): A tájvédelem környezetpolitikai vonatkozásai. (Environment-political relations of landscape usage). A VEAB régió doktoranduszainak tudományos fóruma, vidékfejlesztési szekció. NYME Doktori Iskolák, Sopron.
- Petrovics I. (2007): A Faipar szakmacsoport bemeneti kompetenciáinak mérése az új OKJ alapján. (Input competence measurings based on the new OKJ at the trade group of students of timber industry.). NSZFI, Budapest. Scrutinized METHODOLOGICAL MANUAL.
- Petrovics I. (2007): Az általános nyomdai munka, tűz-, baleset- és környezetvédelem című és a 0956-06 számú modul feldolgozása. (Elaboration of modul 0956-06 on: General protection against fire, accident, and environment in printing.). NSZFI, Budapest. Scrutinized METHODOLOGICAL MANUAL.
- Petrovics I. (2008): „Anyagok előkészítése, nyomatok ellenőrzése és szállítása” című, 0965-06 szakmai követelménymodul tanításához és értékeléséhez. (Requirement modul to NO. 0965-06: Preparation of materials, control and transport of printed materials). METHODOLOGICAL MANUAL.
- Petrovics I. (2002): Nem környezetvédelmi szakképzést folytató szakképző intézetek tankönyv vizsgálati eredménye.(Study-book inquire of non-environment teaching institutions).). In: A tankönyvek hatásvizsgálata a környezeti nevelés tankönyveiben (szerk. Dr. Lükő I.) OMKutatászáró publikáció. NYME Műszaki és Környezetpedagógiai Tanszék, Sopron.
- Petrovics I. (2002): A környezetpedagógiai képzés követelményeinek vizsgálata. (Investigations on requirements in the environment-pedagogical studies). MTA Veszprémi Akadémiai Bizottság, Környezetpedagógiai Munkabizottság, Budapest.
- Petrovics I. (2010): A szakmai vizsgák vizsgafeladatainak mérése-értékelése. (Evaluation of measuring of exam exercises in trade education). Visszacsatolás. NSZFI, OKM, Budapest.

Research reports

- Petrovics I. (2002): A Phare 1991 évi EFE kutatás tankönyv vizsgálata, mint kutatási előzmény. (Inquire of study book of PHARE 1991 EFE as a research preliminary). In: A tankönyvek hatásvizsgálata a környezeti nevelés tankönyveiben (szerk. Dr. Lükő I.) OM Kutatászáró publikáció. NYME Műszaki és Környezetpedagógiai Tanszék. Sopron.