

University of West Hungary
Faculty of Forestry

Theses of doctoral (PhD) dissertation

**EXAMINATION OF 'ŐRSÉG' REGION WITH
CONSIDERATION TO IS NATURAL LANDSCAPE
AND HISTORY OF CIVILIZATION VALUES IN
REFLECTION OF THE ENVIRONMENTAL
EDUCATION COMPLEXITY WITH SPECIAL ASPECT
OF THE SECONDARY SCHOOL STUDENTS' AGE**

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Sopron

2016

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1. Objectives of the research

The aim of this paper is to discover the problems of biology subject education and to show the practical tests with the methodological suggestions making us possible the effective learning. The criterium of the sustainable society is for its members to have scientific knowledge of high quality and also to behave highly responsible towards their environment. It is true not only for intelligentsia dealing with sciences but for those being engaged in some other branch of learning or did not pursue higher education, as well. Therefore the scientific subjects, especially the biology subject, in secondary schools are appreciated by the environment-conscious attitudes, skills development realizing the competence-based education.

In order to achieve our goals, the out of school, activity-oriented methods application was examined in grammar-schools of Vas county and in a special vocational training school, as well as their scientific and environment-protection knowledge in connection with Órség National Park on basis of the final examination requirements of biology subject at secondary school.

In researching work we set a target to prove whether the application of activity-oriented methods have an impact on the university inputs of scientific continuation of studies.

The main aim of this dissertation is to present and examine Órség region with consideration to its natural, landscape and history of civilization values through the environmental education complexity. And also show the environment-conscious view forming of the grammar-school age group through results. According to the secondary grammar-school biology subject at final examination requirements, how the students can understand the problems of nature conservation and environment protection and how we could work out and show the field trip in Órség National Park. Our target is to accomplish a practical, education methodology which develops the key-competences stipulated by National Basic Syllabus with the activity-oriented methods. The paper wishes to prove through some concrete examples that the field trips develop all the competences, not just the scientific ones, as they are the organic parts of education as an essential necessity of the research-based teaching.

The further aim of this dissertation is to show the efficiency of knowledge attaining by regular field trips.

The reason *for examination of the environment-conscious attitude of grammar-school age-group* is to get to know and verify *how behaviour changes by influencing attitudes* for the sake of creating the environment-conscious behaviour.

2. Hypotheses of the research

1. The government order N°110/2012. and the National Basic Syllabus emphasizes that the students shall be provided with environment protection knowledge based on scientific competences. In spite of this, *the environment consciousness of the age group of 17-18 years is not satisfactory* in either knowledge, attitudes or behaviour.
2. Education of the biology subject (2 lessons a week) happens generally with classic pedagogical methods (lecture, explanation). The activity-oriented methods are missing thus development of the scientific competences is not satisfactory.
3. *The teasing to nature of students is not suitable* in spite of requirements in local courses of programme.
4. The secondary school students know the natural, landscape and history of civilization values of Órség Natural park better who are being taught with some activity-oriented methods. We supposed that geographical closeness significantly promote a wide-ranging knowledge.
5. The methods and toolbars of environment pedagogy significantly contribute to forming the environment-conscious attitudes, responsible behaviour of students as well as to an active, acting protection and preservation of nature and of man-made environment while *it leads to research-based integration of subjects taught at grammar-schools and to obtaining multidisciplinary knowledge*.
6. In puberty mental changes, abstract thinking, process of becoming independent do not result in a significant separation of knowledge on Órség on basis of genders.
7. *The most teachers are not committed* in environment education for the suitable environment consciousness. Majority of them did not make the students acquainted *the basis of the living world's constancy and diversity, the human role and responsibility* originating from its evolution position for the sake of optimal preservation of biosphere's abiotic factors.
8. The greater part of students continuing studies in scientific professional field of universities were learning in such secondary schools where some activity-oriented methods were applied.
9. The results of this dissertation *can contribute* on large scale that the secondary school teachers of biology *can make their students acquainted with natural, landscape and cultural history values of Órség National Park by the suggested*

methodological culture according to the requirements of secondary biology at final examination.

10. The attitude testing results prove that the activity-oriented methodological culture greatly contribute to forming an environment-conscious behaviour of the students.

3. The methods of research

➤ Document analysis

The author examined the governmental regulation N° 110/2012.(VI.4.) on publication, introduction and application of *the National Core Curriculum* and also analyzed and worked out concerning the environment-consciousness.

Objectives of *the National Environment Educational Strategy and the Public Education Law* as well as contents regarding educational institutes were examined.

Decree N° 4/2002.(II.27.) KöM on instituting *Órség National Park* was elaborated as well as *managing plans of Órség National Park* was analyzed.

On basis of data recording of the *National Human Resources Ministry* this essay searched the number of students qualified retrospectively for 10 years at scientific education of universities and at teacher's training colleges in connection with exam of maturity at biology subject

➤ Datasurvey

At grammar schools and at 1 special school of vocational training in Vas county between 2000-2014. years the writer of dissertation measured *the number of candidates for final examination, that of students taking a succesful entrance exam and also that of pupils continuing of scientific studies at universities*. The research was completed by oral and telephone interviews concerning the experiences of headmasters.

➤ Field tests

The author discovered the natural, landscape and cultural-historical values being suitable for examining of Órség in accordance with requirements of school-leaving examination at biology subject in order to acquire its natural and environmental contents.

The writer worked out the methodology of field trips at grammar schools. *She put it into practice with one class of 8 forms of Bolyai János Practising Grammar School of the West Hungarian University during the period of 3 years. Floristical,*

phytocenological and vegetation dynamic examinations were made in case of aborescent and unwooded associations. In field trips the students made proposals for treatment of nature protection in order to maintain ecosystems. At the time of landscape changes composition alterations of the associations were indicated by them. The students analyzed the cultural-historical values of Órség and in connection with gene-preservation Fairy Forest of Viszák was examined. The author explored efficiency of the researching work and also the quantitative and qualitative appearance of the students' knowledge by their own personal experiences.

➤ ***Datasurvey with questionnaire***

The author investigated *the use of activity-oriented methods in process of knowledge acquiring regarding the Órség National Park at grammar schools and 1 special school vocational training in Vas county by questioning in writing.* Researching work was done in classes sitting for the final examination after the 3 years' learning of biology subject. The class of János Bolyai Practising Grammar School of West Hungarian University took part in measuring who had also attended the field trips usually in process of knowledge acquiring. Thus the results conclusions of field trips were outlined, the writer made also proposals and emphasized the insufficiencies of environmental education at secondary schools.

➤ ***Effectiveness examination with attitude tests***

During experiments the writer wanted to know *how the environment-conscious attitude and behaviour changes by application of field trips in knowledge-acquiring.* This was done by 2 groups of pedagogical experience. The students of 2 groups (experimental and control group) learnt at the same grade of János Bolyai Practising Grammar School of West Hungarian University. *The students of one group took part in field trips for 3 years but the members of control group did not do. The number of lessons from scientific subject was the same at school. The field trip was chosen as an independent variable in pedagogical experiment in order to prove its efficiency. The dependent variables were the competencies of grammar school students.* Measuring changes in these, the questioning in writing was used by the author. Survey was done twice in 2010. before beginning of field trips and after finishing of them in 2013. On basis of results the writer drew up conclusions and proposals.

4. Results of the research

During the examination of scientific competencies of the secondary school students the main target of this paper was to find the main problems concerning biology subject education at grammar school and also make proposals for solving them. The necessity

of this can be explained by crisis of today's scientific teacher's training and also decreasing of the scientific university input as well. The results of research of this thesis show that the great shortage of biology, chemistry, physics, geography and environment studies teachers at secondary schools, together with candidates for final examination at secondary grammar school in Vas county waiting to enter for scientific university courses, can endanger forming of the sustainable society in the future. The results proved that *majority of the students studying in scientific specialization of universities had been learning at grammar schools where the activity-oriented methods were applied.*

The efficiency of educational strategy of environment pedagogy was justified by the field trips of West Hungary University János Bolyai Practising Grammar school. The exam requirements of maturity from biology in nature and environment protection for Órség National Park were processed with field trips together with activity-oriented methods for 3 years. The results prove that the field trip tests produce applicable knowledge, widely increase and extend some ecological, nature and environment protection knowledge of the grammar school students regarding biology subject. The independent work skill, the collaboration in team develop the key competencies of National Core Curriculum together.

Questionnaire survey at grammar schools and a specialized secondary school of Vas county concerning Órség National Park show that *the environment consciousness is not satisfactory at the age-group of 17-18 years.* While the secondary scientific education has a direct effect on the higher education, therefore we do need *the methodological reform of secondary scientific education.* The students do not continue university studies or not at scientific faculty, their natural sciences' competencies are based on secondary biology knowledge. In Vas county it comes to 70-80 per cent of the students sitting for the final examination. *The methodological renewal, the paradigm shift is essential need for forming an environment-conscious thinking and also an individual responsibility for status of environment.*

On basis of researching work we can tell that in the framework of biology education *theoretical teaching, application of the classical pedagogical methods are more stressed there are very few activity-oriented methods being out of lessons* (field trips, school-excursions). From 10 examined institutes of Vas county there is only 1 where some regular field trips were kept, and school excursions were held at 6 grammar schools. Several documents prescribed the problem solving thinking developing methods in use (National Core Curriculum, National Environment Education Strategy, Biology:detailed exam requirements of maturity). *In the lack of field trips the*

environment education cannot be realized efficiently so the scientific competencies development is not satisfactory.

If we investigate the Pedagogical programmes of the institutes acting in researching work, there are only generalities regarding the environmental education in them. Concrete aims, tasks and forms of work methods do not appear. *Most teachers are not committed* to the environment education in order to shape up a suitable environment consciousness. In the lack of this, the questionnaires discovering knowledge of Órség National Park's values and the cognitive maps were examined and these results prove that *chaffing of the students to nature is not proper*. In the pedagogical programme of West Hungary University János Bolyai Practising Grammar School the environmental education is of great importance.

In dissertation the results testing efficiency of field trips significantly justify that *the secondary school students know the natural, landscape and history of culture values of Órség National Park better who are taught by some activity-oriented methods*. However the students of 2 grammar schools are believed *to have shown better results because of the geographical nearness*. The results of research also prove because the students of 2 grammar schools near Órség did not take part at field trips.

The cognitive maps connecting with Órség, semantic knowledge, cultural arrangements and analysis of touristic attractive force show that *the field trips form the emotional chaffing to landscape as well*. Determining role of the individual chaffing to home-land leads to responsible, environment-conscious behaviour and also contributes to active, acting defence of the natural and man-made surroundings. The efficiency of traditional and activity-oriented methods to environment-consciousness is proved by an environmental and pedagogical experiments. By comparative analysis of attitude testing we stated that the group of field trips developed in the form of environmental attitudes, there was a significant difference to the control-group and also to starting values. The field trips effectively develop the students' environmental consciousness, there has been a positive impact on forming of the responsible behaviour.

On basis of the methodological guide-book examinig *natural, landscape and history of cultura values of Órség National Park*, similar tests can be designed and realized in order to be familiar with some other national parks of Hungary.

5. Theses of the dissertation

1. Decreasing of biodiversity causes a global problem at genetic, taxonomic and ecological level nowadays. Its stopping, lowering can be realized just by

sustainable society and also by the members of society having some multidisciplinary knowledge and personal responsibility towards the state of environment. In interpretation and lowering reducing of biodiversity *the role of biology subject is appreciated in secondary school education while the body of knowledge of its areas of science is mostly suitable for complex development of the environment-conscious attitudes, abilities, skills.* The competencies of students not learning further in universities or not in scientific faculties, their scientific competencies are mainly based on biology subject of secondary schools. *Today the environment consciousness of group aged 17-18 years is not satisfactory in the field of either knowledge or attitudes, behaviour in spite of rules of National Core Curriculum.*

2. In teaching of biology subject of secondary schools *the theoretical education, application of the traditional class methods are stressed, and there are few activity-oriented methods (laboratory tests, field trips, school-excursions).* Although several documents (National Environment Education Strategy, National Core Curriculum, Detailed Requirements of School-Leaving Certificate for Biology) also emphasizes use of the problem-solving thinking development, in spite of expectations the competency-based teaching does not put into practice.
3. The proper, complex development of scientific competency forming the personal responsibility for the state of environment is realized in few grammar schools. In pedagogical curriculums any concrete contents, aims, tasks and their methods connecting with environment education do not appear. *Therefore the chaffing of the grammar schools' students to nature is not satisfactory.*
4. The natural, landscape and culture-historical knowledge of the students regarding Órség having attended field trips, show a significant difference compared to some other institutes. Some elements of the cognitive maps the protected animal and plants as well as the semantic also prove that *the field trips do not only knowledge lead to quantitative increase of knowledge but to appearance of the personal, emotional, absorbed qualitative attraction for landscape as well. The reason for wider knowledge is also the geographical nearness.*
5. As a strategy for environment pedagogy *the field trips* at Órség, the laboratory tests to getting to know Órség (,white dirt' soil, water patterns) through development of special subjects and of general competencies *realize the research-based integration of taught subjects in grammar school education, thus the multidisciplinary knowledge will be obtained.*
6. The examining material concerning Órség National Park, on basis of the students' answers' statistical analysis, we can state *there is no significant difference according to genders at the age of 17-18. years in knowledge regarding Órség.*
7. *The knowledge level of the grammar school students in Vas county before a school-leaving examination concerning Órség National Park is low. In the lack*

of field trips, without getting experiences, *most teachers are not committed to environment education. That's why it is necessary for the teachers of biology to have an urgent methodological renewal, application of the activity-oriented methods, project education as education strategy of environment pedagogy but mainly a change of attitude.*

8. *The use of field trips' examining methods forms a scale of values in our students continuing their higher education in scientific field as a result of this.* In educational institutes attending researching work of Vas county, on basis of average of 5 years annually 12-19 per cent of the candidates for final examination at secondary schools took an entrance examination successfully for scientific specialities at universities. This figure is 36-39 per cent at the János Bolyai Practising Secondary Grammar School of West Hungarian University because of use of activity-oriented methods, field trips, laboratory tests.
9. In accordance with requirements of school-leaving examination of biology subject, and also with its rules of ecology, nature and environment protection, the natural, landscape and culture-historical *value examination of Órség National Park, the guide-book and the methodology of complex field trips tests* shown in this paper, can give help for teachers of biology of secondary schools in Vas county to familiarize with Órség National Park. At the same time, on basis of its practical, educational methodology *it can be adapted* as a pattern for examining some other national parks.
10. As a result of the attitude tests done in 2010 and 2013, as to a comparative analysis we can state *there was significant change just at group of field trip in the environment-consciousness of grammar school group aged 17-18 years*, not at the control-group, as a matter of fact the actions were less. The attitude examination indicated that *acquiring of knowledge happens exclusively through theoretical way did not form behaviour elements leading to more environment-conscious attitudes.* On basis of the environment-conscious behaviour examination it was stated that *in puberty gender has no importance of the environmental attitudes in quality but age has a role just partly in a higher appearance of the environmental attitudes.* According to tests results, gender and age are not determinant in themselves.

6. Proposals

- Nowadays there is a necessity for the secondary grammar school students to be taught in biology subject through activity-oriented methods getting complex, systemic knowledge as an educational strategy of environment pedagogy instead of the recent applied, frontal methods. *In educational curriculum of biology subject of the secondary schools a field trip at list 1 per school year should be introduced compulsorily in syllabus of biology course* in connection with phytocenological,

vegetation dynamic examination of the arborescent vegetation or unwooded associations. All the institutes make field trips in a national park being near their dwelling places if possible.

- In the exact sciences of universities we have to increase the number of students. On basis of the high admission point-limits we can suppose some wide-range competences of the future students provided by secondary school education. In spite of the undivided teacher's training restarted in 2013 *a reform of education of natural science is wanted in secondary schools with the aim of compensating crisis of the scientific teacher's training.*
- In realization of field trips there is a problem to have just 2 lessons weekly for biology subject to teach but 1 day at least for field trip is necessary. To solve this issue the holiday of maturity could be suitable. *The task of teacher specializing in biology being committed environment education is to initiate another colleague from teaching-staff as well, while some body of knowledge of various areas of science can also be integrated into the field trip examinations because of complexity of the activity oriented methods.* That's why the practice-oriented education *can also develop collaboration of subject teachers.*
- *Forming of sustainable society is the task of each subject teacher during the grammar school teaching. Competencies are to be made in students for moderating global challenges by which an individual responsibility for environment will be formed.* Since the field trips cause the complex development of competencies thus they are so popular with students. The motivating effect of theory and practice shapes up some positive environmental attitudes in field trips not only in case of students being interested in sciences. *Each member of the teaching staff is obliged to strenghten discovering beauty of nature honour of it, its importance as a natural resource in students.*
- In public education *targets, tasks, activities and methods promoting realization for environment education in pedagogical programs of institutes are drawn up in detail.* The actual realization of programmes is certified to purpose with photos in data-base while they are significant in determining school image as well, having a positive effect on registration of pupils at school.
- According to 2011./CXC/4§(15.) law on national public education, since January 1st, 2016. year the students preparing for final examination shall justify 50 hours public service. It would be purposeful *to use 10 of 50 hours' secondary school public service for nature protection compulsorily.* In natural parks the students can do work, by which their environment conscious attitudes may change and these activities would also motivate their subject teachers (e.g. hay-harvest, frog saving,

planting of saplings, forest cleaning, technical aid for natural parks' programmes). In natural parks by activities making by students such environmental attitudes can form which lead to an environment conscious active, acting behaviour and a change of attitude for subject teachers.

- The students with their subject teachers shall make field trips in grammar schools, in technical institutes dealing with environment and nature protection mainly, in landscape-protection areas of natural parks being to a dwelling place and in other landscapes of Hungary. The examinations being published for everybody, *a methodological collection for final exam requirements showing the values of natural parks can be established*. This would make the secondary school students possible to get to know the values of natural parks through *biological camps, school-excursions*.

7. Publications

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2. Horváth Katalin (2015): Természeti értékek vizsgálata terepgyakorlatok során. In: Fókusz Vajdasági Ismeretterjesztő és Tudománynépszerűsítő portál. 136-137. szám. <http://www.fokusz.info/index.php?cid=1654330260>
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9. Horváth Katalin (2014): A kulcskompetenciák és a kiemelt fejlesztési feladatok céljainak megjelenése a tanórán kívüli környezeti nevelésben. In: Módszertani Közlemények, 2014. LIV. évfolyam 3. szám, Szegedi Tudományegyetem Juhász Gyula Pedagógusképző Kar, Szeged, ISSN 2063- 3734, pp. 20- 37.
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