

**UNIVERSITY OF WEST HUNGARY
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Theses of doctoral (PhD) dissertation

**THE ROLE OF NATURE TRAILS IN THE FORMING OF
ENVIRONMENTAL APPROACH – DESIGN, EFFICIENCY AND
METHODOLOGY**

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1. Importance of the research

The research of nature trails (also called nature interpretation trails or nature education trails) is timely and important because of its novelty in Hungary. Although the first nature trail was established in Hungary in 1972, their number increased significantly only around the millennium. However, the professional and pedagogical design background of the finalized trails has not yet been investigated, and no standardized design requirements have ever been set concerning nature trails. At the same time the increasing number of nature education and interpretation trails as well as the reevaluation of their role in the forming of environmental approach would require a higher-level consideration of the professional, pedagogical, methodological respects in the design process. Furthermore, the design frames and permissions need also be defined in order to eliminate the currently experienced shortcomings in the field of nature trail design.

Up till now, no standardized design requirements have been established yet for nature trails, in Hungary. There are two considerable methodological and practical guides written in Hungarian language, and their authors themselves have also taken part in the setting up of nature trails. The practical considerations, included in these books are well applicable respecting the national circumstances and conditions, thus making these sources as basic literature for the current research. Nevertheless, because of the little number of applying scientific literature there is no foundation for a comprehensive comparison between different design approaches. The organizations, well-practiced in the subject (e.g. managements of national parks, forestry companies) presumably approximate the questions of design regarding their own, tried and tested habits, carrying out mostly no previous literature review. If we intend to research the circumstances of the setting-up of nature trails in Hungary, it is necessary to investigate the activity of the designing organizations and to evaluate the realized exemplary projects. Apart from the mentioned and highly practical Hungarian books (written by Gábor Kiss *et al.*) the literature review of the dissertation based mainly on international sources, most of which originated from North America, Australia, England and Germany. By studying this literature the main respects of foreign nature trail design concepts can be understood. It is highly important to investigate the presence of the concept of sustainability and to adapt good practices for national circumstances. The investigation of the functionality and efficiency of nature trails does not have scientific research results.

The dissertation embarks upon the presentation of the representative research carried out on the questions and issues up-till-now not yet investigated.

2. Aims of the research

The design of nature trails is a multidisciplinary field, requiring the integration of scientific, technical and pedagogical/methodological knowledge also keeping in mind significant touristic aspects.

The aims of the research were as follows:

- Introduction of the place, role, types and design/methodological concerns of nature trails in the forming of environmental approach and environmental interpretation complemented with an international outlook in the field. By the study of foreign examples the respects of extraneous nature trail design concepts and the practical results on the challenges of sustainability can be analyzed.
- After acquiring the results of the investigations the preparation of a proposal for the adaptation of international experience to national circumstances.
- Unveiling the relationships of nature trail design and the general aspects of the integration of pedagogical/ methodological respects.
- Demonstration of the importance of dimensions of sustainable development as well as of the applicability of the complex, holistic approach for the design and utilization of nature trails (ecological, economical, cultural and social dimensions).
- Investigation of the justification of nature trails, attitude of the population, usefulness and functions.
- Investigation of the efficiency of Hungarian nature trails. Comparison of the efficiency of three major nature trails which represents the substantial part of the dissertation. This type of research has not yet been carried out in Hungary. Defining the characteristics of an efficient trail.
- Assessment of the needs of tourists and visitor. Revealing the ecotouristic possibilities of nature trails. Using the results, reconsideration of the design concepts and formulation of methodological recommendations for the design process.

3. Main questions and hypotheses

Main questions:

- What are the main functions of nature trails in Hungary and abroad?
- What regulations control the design of nature trails?
- Are the main elements of sustainability involved in Hungarian nature trails?
- Can any kind of professional and scientific grounding be indicated in the design of nature trails?
- Which information arouses the interest of the visitors mostly?
- Which nature trails are the most popular ones?
- How determinant is the dominance of the ecological function of nature trails?
- Are there close relationships between the technical and pedagogical aspects?
- Is there significant learning achieved by the visitors during the ranging over nature trails?
- How do the investigated nature trails contribute to the forming of the environmental approach of young (8-20 years old) people?

Hypotheses:

H1: The system of activities of nature trails contributes significantly to the forming of environmental approach.

H2: Visitors learn (gain significant knowledge) while ranging over nature trails.

H3: Nature trails are also preferred by visitors who look for places for hiking, recreation or spending free time. Especially the interactive, visitor-friendly and exemplary trails are important in this regard.

H4: The nature study trails are the most popular ones: what excites the highest interest among visitors is the fauna and flora; the primary function of nature trails is thus the enlargement of ecological knowledge.

H5: There is a close relationship between technical and pedagogical aspects: the enjoyment of nature trails can be guaranteed by not only fulfilling technical requirements, but also by respecting clarity, interest, and raising attention: all of which can only be realized by the integration of pedagogical methods.

H6: Nature trails are most frequently visited by people having an academic qualification or by the school age group.

H7: The design of nature trails is well-founded in Hungary, however there are significant shortcomings regarding pedagogic, methodological and sustainability aspects.

4. Applied methods

The following methods were applied during the *first phase* of the research:

- analysis of the Hungarian and international *scientific literature*;
- *studying of the documents* on the design of nature trails;
- *the analysis and comparative evaluation* of the national and international scientific literature on the role and on the pedagogical (environmental pedagogical) and technical design of nature trails;
- *monitoring and writing case studies* during field trips and visiting nature trails, national parks and ecological centers in Hungary and abroad;
- mapping of major traits and types of national and international nature trails by tours, publications and photo-documentations.

During the second phase of the research the national characteristics and respects of the design of nature trails were assessed by means of interviews with designing organizations and experts. Among the methods of empirical surveys, *a written questionnaire* was applied most frequently, which revealed the motivations, fields of interests, habits of visiting and needs of the visitors. The processing of the results was accomplished using *descriptive statistical methods, plain summary, calculation of frequencies and averages* as well as with *content analysis*. The investigation of efficiency of the nature trails was also carried out using *questionnaires at three locations* (Tiszavirág Floodplain Walk and Nature Trail, Lóczy-Geyser Nature Trail, Gyadai Study Trail) where a special focus was given to the pedagogical method of the *measurement of the level of knowledge* and to the *self-controlled pedagogical experiments*. The evaluation of the efficiency measurements was carried out using *statistical methods*.

Empirical surveys involved the written questioning on the opinion of altogether 827 persons out of which the gain of knowledge was analyzed in the case of 305 people.

5. Results, conclusions and theses

By summarizing Hungarian and international design concepts it could be established that there are a lot similarities among different countries concerning regulations and recommendations, which are also influenced by country-specific factors. Both the international regulations and Hungarian recommendations prove that the setting-up of nature trails requires thorough design and close cooperation on behalf of the stakeholders. Besides of the technical planning and implementation, a special focus must be given also to pedagogical and psychological aspects.

According to the results of the *first set of questionnaire* surveys (397 people) the majority of visitors was interested mostly in the animals and plants. *Hence the hypothesis, claiming that nature study trails are the most popular ones among visitors, thus the enlargement of ecological knowledge results mostly (H4) was found to be true.*

According to the opinion of the majority of the surveyed visitors good nature trails are interesting, easily passable, clean, informative, easy to understand, scenic, near-natural, well-maintained, transparent, attention-raising, and by no means too long. *Thus, hypothesis H5 claiming that „there is a close relationship between technical and pedagogical aspects: the enjoyment of nature trails can be guaranteed by not only fulfilling technical requirements, but also by respecting clarity, interest and raising of attention: all of which can only be realized by the integration of pedagogical methods.” was found to be true.*

Visitors expect from an ideal nature trail the possibility to get acquainted with natural assets (primarily with plants and animals) and to spend their free time pleasantly: the adults and children together can get acquainted with natural spectacles playfully by a trail interspersed with picnic areas and furnishings.

According to the results of the *second set of questionnaire* surveys (125 people) it could be concluded that in Hungary people mostly prefer assigned environment study (or nature study) trails with information boards and presentations, destined for hikers. The overall dominance of this type of trails was also confirmed by interviews with designers/constructors.

By the comparison of the results of the two surveys in respect of the expectations of the concept of an ideal nature trail it could be concluded that well followable routes and variety were very important according to both of the surveys.

According to the interviews with designing organizations, the planning of nature trails is professionally well-established in Hungary. The shortcomings regarding pedagogic, methodological and sustainability aspects could however, only be verified partially basing on the responses of the interviewees, thus *hypothesis H7 could only be justified partially, too.*

The most important part of the research involved the measurement of learning efficiency in the case of three Hungarian nature trails (Tiszavirág Floodplain Walk and Nature Trail, Lóczy-Geyser Nature Trail, Gyadai Study Trail).

Almost the third of the visitors (98 people, 32%) were young people from the 8-20 years age class. The proportion of visitors having an academic qualification was high in all of the three locations (altogether 136 people representing 44.6% of all visitors, and 64.6% of the young people over the age of 20), *thus hypothesis H6, presupposing that „nature trails are most frequently visited by people having an academic qualification or by the school age group” was justified.*

In the case of all of the three nature trails the majority of respondents claimed that the primary goal of visiting was hiking and spending their free time. *The above results justified hypothesis H3, claiming that „nature trails are also preferred by visitors who look for places for hiking, recreation or spending free time. Especially the interactive, visitor-friendly and exemplary trails are important in this regard”. This was also verified by the first questionnaire survey resulting that visitors expect from an ideal nature trail the possibility to get acquainted with plants and animals, and to spend their free time pleasantly.*

People visiting the Tiszavirág trail stated that the most significant benefit of their visit was the observing new species and learning about special local features, while hikers at the nature trail of Gyadai mentioned the observing of new species and the understanding of ecological relationships as the two most important pieces of knowledge gained. Visitors of the Lóczy-Geyser Nature Trail responded that the most significant benefit of their visit was learning about special local features and observing new species. These findings justify hypothesis H1 according to which *„the system of activities of nature trails contributes significantly to the forming of environmental approach”. This was also verified by the first questionnaire survey (showing that according to the respondents one of the most important function of a nature trail is teaching) and indirectly also by the investigation of the gain of knowledge.*

The answers given to the questions concerning the design/methodological aspects proved that pictures and substantive wording in the information

boards were the most effective in attracting visitors' attention, in the case of all of the three nature trails.

The most pregnant field of the research involved the measurement of the efficiency of learning in the case of the three assigned nature trails. *Results showed that visitors significantly gained in knowledge while ranging over all of the three investigated nature trails, thus hypothesis H2 could be justified, too.* Evaluation of data also proved that guiding significantly improves the efficiency of nature trails in the transferring of knowledge. It seemed reasonable to investigate the gain of knowledge separately for the people with an academic qualification and for young people (8-20 years age class). In the case of people with an academic degree the gain in knowledge is not accidental, which could be proven with a 99% probability. In the case of young people the same conclusions could be drawn when calculating separately for all three spots, when regarding cumulative data from the three spots the significant gain in knowledge can be proven with a 95% probability.

Basing on the results of the multistage research methodological recommendations can be proposed for the design concept of nature trails.

Theses

1. Basing on Hungarian an international scientific literature, field surveys and on professional discussions it can be concluded that the basic methods of the design of nature trails are similar in Hungary and abroad, yet the circumstances may be markedly different. There are a lot of special and country-depending factors influencing the design process, e.g. centralized regulations of the lack of it, different social expectations, different amounts of funds, territorial and climatic circumstances. Up till now, the aspects of sustainability have been realized better in the case of foreign nature trails.

2. By the use of empirical surveys it has been concluded that nature study trails are the most popular among Hungarian visitors. It is the fauna that raises the attention of the visitors mostly, although the dominance of the introduction of plants is usually more characteristic.

3. By the evaluation of empirical surveys and the analysis of good practices it has been concluded that there is a close relationship between technical/pedagogical aspects, as the enjoyment of nature trails can be guaranteed by not only fulfilling technical requirements, but also by respecting clarity, interest and raising of attention: all of which can only be realized by the integration of pedagogical-psychological and interpretation respects.

4. By the results of the questionnaire survey it has been established that nature trails play a determinant role in the forming of the environmental approach.
5. The most apparent benefit of nature trails is the recognition of nature and the endearing people to nature. Trails are also preferred by visitors for simple hiking or spending free time, especially the interactive, visitor-friendly trails are popular in this regard.
6. Basing on the data of surveys it can be stated unequivocally that pictures and substantive wording in the information boards were the most effective in attracting visitors' attention. Especially the trails equipped with interactive tools enjoy popularity.
7. The statistical evaluation of the data acquired from the three investigated trails revealed that a significant gain in knowledge was achieved by people visiting the nature trails.
8. Evaluation of empirical data proved that guiding significantly improves the efficiency of nature trails in the transferring of knowledge.
9. According to questionnaire surveys the predominance of adults with an academic degree and of children/young people could be evidenced among the visitors.

6. The author's publications concerning the dissertation

Books, chapters in books:

KOLLARICS TÍMEA (2014): Tanösvények hatékonyságának vizsgálata - A Lóczy-gejzír sétaút felmérésének tapasztalatai. In: Nagyházi Bernadette, Vörös Klára (szerk.) (2014): Innováció a neveléstudomány elméleti és gyakorlati műhelyeiben: Tanulmánykötet. Kaposvár: Kaposvári Egyetem, 2014. pp. 56-65. (ISBN: 978-963-9821-77-4)

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