



Teach it to sustain it! Environmental attitudes of Hungarian teacher training students in Serbia



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ABSTRACT

Environmental education plays a crucial role in children's education, familiarizing them with the concept of sustainability and developing their environmental consciousness. Conversely, it also becomes necessary for teachers to live in an environmentally conscious way and to represent the standpoint of sustainable development and its practice. The present research introduces a longitudinal survey of teaching students' environmental attitude values attending University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica between 2012 and 2015. Three separate environmental attitude measure scales (CHEAKS, RevNEP, ENV) were applied in order to assess the extent to which the undergraduate educational content contributed to the realization of sustainability education. The research results demonstrate that the environmental attitudes of students have significantly increased by the end of their undergraduate education. It has also been concluded that the currently implemented curriculum, which incorporates natural science and methodological elements, contributes the most to the successful development of positive attitudes toward sustainability, as well as the formation of adequate skills and key competences. This study directly facilitates the institution's function and contributes to the professional development of its lecturers and students, as well as establishing a team of researchers focusing on environmental education.

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1. Introduction

The concept of sustainability is still ambiguous due to the range of parallel definitions regarding the term itself (Scott, 2015). The difficulty of grasping the essence of sustainability lies in the fact that several scientific fields refer to the same concept with varying interpretations (Bolis et al., 2014). Its definition is highly influenced by ideas and ideologies regarding the relationship of humans and the environment. According to the perception of humanists and anthropocentrists, by protecting the environment, humans protect themselves. The removal of humans triggers the devaluation of nature (Kopnina, 2015b). The Brudtland Committee's report titled "Our Common Future" also follows this principle regarding the definition of the concept of sustainable development; i.e., it entails developmental processes of certain elements of society that "meets

the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This definition, however, fails to acknowledge that we are obligated to maintain not only the human race, but all living creatures (Oakley et al., 2010; Kopnina, 2015b). Every component and system of the Earth participates in the regulation and balancing of the planet in order to sustain its current life processes. This complex system of regulations ensures the function of biospheric balance. Thus, sustainability should not be viewed exclusively from a human perspective (Musters et al., 1998; López-Ridaura et al., 2002; Lehtonen, 2004; Bonnett, 2004; Abolaji et al., 2011).

The developing and accelerating scientific-technical development following World War II has triggered a shift in the biospheric balance. It enabled humans to completely take over the Earth and exploit the so far unapproachable jungles and oceans. The global natural system has transformed into a global economic system. This development affects the future of the whole biosphere. The human race pollutes its environment limitlessly and excessively utilizes its natural resources, risking not only our own future but also that of all the other creatures. This responsibility must be addressed when the concept of sustainability is discussed. In a broader sense, the

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purpose of education for sustainability aims to prevent pollution and maintain the biosphere (Kopnina, 2013, 2014).

Three subcategories interact with each other subject to the definition of sustainable development, namely, the environmental, social and economic systems. Dense interaction can be observed among the abovementioned systems that are detected as well as interpreted by humans; therefore, the idea of analysing sustainability from several perspectives has rapidly emerged (Musters et al., 1998; López-Ridaura et al., 2002; Lehtonen, 2004; Abolaji et al., 2011).

The pedagogy of sustainability aims to enable the sustainability of the earthly ecology system by educating well-informed and active citizens who possess the adequate attitudes, habits, values and competences as well as the social system to implement change. Environmental consciousness, the development of environmentally conscious behaviour and the positive formation of value systems, attitudes and thinking, as well as knowledge enrichment regarding the environment and society, are all preconditions of achieving the abovementioned objective (Thiengkamol, 2011; Heyl et al., 2013; Hofman, 2015). In several cases, the difficulty of introducing pedagogy for sustainable development into the educational system originates from the obstacle that both knowledge transfer much more complex attitude formation and development must occur (Shephard and Furnari, 2013). Additionally, it is inevitable to integrate the necessary knowledge about the multi-layered, natural and human-created environment as well as positive attitudes towards it, in line with the concept and objectives of sustainability, into the system of pedagogical activities (Kopnina, 2015a). It is difficult, however, to incorporate such critical thinking into any level of the education system, specifically into the traditionally formed frameworks of the education system. Thus, the realization of intensive environmental education programmes proves to be required in order to establish a balance between the ideas and objectives of traditional pedagogy and the pedagogy of sustainability (Carleton-Hug and Hug, 2010; Kopnina and Meijers, 2014).

The term pedagogy for sustainability refers to all pedagogical aspirations that aim to educate people who would be able to form and operate a sustainable society (Song et al., 2011). The goal of pedagogy for sustainability is to establish life-long learning processes that provide members of society with creativity, problem-solving skills and familiarity in natural and environmental sciences, as well as the social, legal and economic fields in order to take responsibility for acting individually and mutually. Such actions ensure a healthy environment and effective economy for the future (Zsóka et al., 2013; Ideland and Malmberg, 2015). The pedagogy for sustainability means that education establishes interconnections among the environmental, social and economic systems with the purpose of acquiring their operational rules. The integrated system approach also requires inter-subject and inter-science approaches, namely, the object under investigation (i.e., the environment) is an integrated system, so it appears as a unified entity as well as a unit consisting of several elements (Simon, 2009; Hofman, 2015; Sammalisto et al., 2015; Verhulst and Lambrechts, 2015; Lozano et al., 2015).

The formation of environmental consciousness can be realized in an institutional and organized form within the educational system as well as outside the institution (Heyl et al., 2013). The impact of family and friends can also be highly influential in line with various knowledge-widening literature and mass media. Television and the internet are primary information sources for youngsters today (Vicente-Molina et al., 2013). In spite of the information at the disposal of the younger generation, knowledge related to environment and everyday environmentally friendly behaviour is inadequate (Kara et al., 2015). Thus, it is essential to establish an

institutional and educational policy in favour of sustainable education while focusing on the successful introduction of cognitive and affective developmental education programmes that ensure the acquisition of complex knowledge (Ramos et al., 2015). According to a study conducted among Hungarian university students (Zsóka et al., 2013), the most important element in the formation of environmental consciousness is, first, individual motivation, and second, education. The majority of students, however, believe that environmental education can strengthen positive attitudes toward the environment.

2. Background and context

2.1. The role of universities in sustainable development

In recent years, more and more universities have realized the role of higher education in sustainable development, since they are responsible for the education of our future leaders, decision-makers, entrepreneurs, researchers and consumers, as well. Thus, an increasing number of universities aspire to transform their education policies in favour of the goals of sustainability (Vicente-Molina et al., 2013; Jowett et al., 2014; Holm et al., 2015). Not all scientific fields, however, have successfully found their places within sustainable development. Various false ideas are still present, e.g., that environmental protection should be developed within the framework of the natural sciences. Nevertheless, environmental problems are of social scientific origin, since it is human activity that causes them. Therefore, social sciences and cultural content are essential in the formation of a sustainable approach (Vicente-Molina et al., 2013).

The introduction of pedagogy for sustainability into university curricular systems is still not in practice. “Green universities” contribute to sustainability primarily through the elaboration of economic and political factors (such as ecological energy and water consumption or selective garbage collection) and inner and outer space management. The pedagogical goals of the pedagogy for sustainability are realized within the framework of one or two special courses, while the reformation of the higher education system, complex development of curricula and interdisciplinary approach formation ought to be executed according to the principles of sustainable development (Cebían et al., 2015).

2.2. Pedagogy for sustainability in the European higher education

In Europe, several countries have realized the importance of higher education in the field of sustainability and strive to incorporate the fundamental principles of “green universities” into their education policies.

In Ireland, Cork University Hospital (CUH) joined the Green-Campus Programme (GCP). As a result, within three years, a considerable decrease in waste and energy consumption was observed (Ryan-Fogarty et al., 2016).

In Lithuania, the Institute of Environmental Engineering at Kaunas University of Technology, following a pilot study, introduced the “QUESTE-SI evaluation and accreditation process” into their MSc and PhD programmes that guarantees the incorporation of the principles of sustainability into the education content of the different programmes. The purpose of the two-year-long MSc Environmental Engineering education programme is to approach the current and future environmental issues originating from industrial development in an environmentally friendly manner and ensure sustainable development in this particular area. Meanwhile, the purpose of PhD studies is to successfully integrate the elements of sustainability into the Environmental Engineering and Landscape Management programme, which has existed since 1994. The

pilot research results confirm the successful integration of technological and scientific elements of sustainability into the curriculum. An interdisciplinary approach to problems was achieved that enabled students to acquire the international standards of sustainability, as well as develop their risk management and crisis communication skills, which help establish a long-term feeling of co-operation among experts within the industry (Staniškis and Katiliūtė, 2016).

The example of the Lithuanian state university (Vytautas Magnus University, Lithuania) supports our assumption, i.e., the integration of the ideas of sustainability into the education system is still in its early stages and requires further development. Dagiliūtė and Liobikienė (2015) carried out a study among 492 university students between 2011 and 2012, determining that the ideas of sustainability ought to be integrated into higher education much more deeply than previously assumed, pervading its total curriculum and avoiding fragmented and superficial content.

Fernandez-Manzanal et al. (2015) at the University of Zaragoza in Spain interviewed 70 graduates regarding their knowledge and various activities related to environmental protection and sustainability. These researchers arrived at the conclusion that more intensive communication is required than before between the private and educational sectors with regard to the process of curriculum formation. More practical education is necessary, as only a small number of the research subjects believe that university education has prepared them to successfully handle environmental problems by the practical integration of the ideas of sustainability.

To successfully integrate and perform the principles of pedagogy for sustainability, devoted and well-qualified teachers and professors are needed at every educational level, from pre-school to university. The University of Plymouth in Great Britain investigated the knowledge and attitude of lecturers regarding sustainable development, as well as their opinions about the opportunities for its incorporation into the university curriculum. Research results show that although the interpretation of the concept of sustainability and attitudes towards it are developed and positive, only approximately 50% of the lecturers integrated it into their courses (Cotton et al., 2007).

The University of Szeged, Juhász Gyula Faculty of Education in Hungary is the nearest institution to the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica, where the language of instruction is Hungarian. The University of Szeged has an outstanding position on the international list of green universities, as announced by the Universitas Indonesia (UI) in 2010 (Lauder et al., 2015). Currently it is ranked 107th out of more than 500 universities (UI Green Metric, 2016). The university senate accepted the Sustainable Development Strategy of the University of Szeged in 2008, which was updated in 2010 and 2011 (University of Szeged (2016)).

The University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica is in co-operation with the University of Szeged. Both universities have a teacher-training profile; therefore, the interest in sharing best educational practices is mutual, and the exchange programmes of the two institutions have proved to be successful. In the future, this co-operation ought to expand in the process of becoming a green university through successful transfer of knowledge and experience by the University of Szeged with regard to their processes of sustainable development strategy.

2.3. Appearance of sustainability in higher education in Serbia

General data on higher education in Serbia are disappointing. According the official statistics, less than 10% of citizens are college educated and only 14% have higher education (Vukasović, 2007).

Serbia is currently striving to find a path towards an open

postmodern society that is integrated into the globalized world, and thus, benefits from (or is exposed to) the open flow of knowledge, people, commerce and goods. The environment for such changes is not favourable: economic crisis and demographic challenges, along with barriers typical for post-transitional societies, may pose considerable obstacles. The only efficient response of Serbia to the abovementioned challenges should be the strengthening of competitiveness through the establishment of knowledge societies (Milutinović and Nikolić, 2014).

The Republic of Serbia is currently in the process of drafting the Strategy of Education Development to 2020+. It can be seen as the first comprehensive “umbrella” policy document in the Serbian education system. The strength of this strategy should be the fact that it treats education in close connection with other sectors and that the changes cover all education levels from pre-school to lifelong learning, with a strong emphasis on higher education (Ivic and Pesikan, 2012).

The National Strategy for Sustainable Development sets the following objectives:

1. Providing favourable economic-financial, institutional and technical conditions for the introduction of educational reforms and education for sustainable development;
2. promoting sustainable development via formal and informal education channels;
3. further education of teachers and professors at all levels of education regarding the concept and practice of sustainable development;
4. ensuring systematic advancement in research and education of sustainable development; and
5. continuing improvement in co-operation with regard to national, regional and international plans (Nacionalna strategija održivog razvoja, 2008).

Currently, there are two parallel political reform processes in Serbia that are important for understanding of the role of higher education institutions in sustainable development: (1) the national sustainable development initiative, including the National Sustainable Development Strategy and Serbia 2020 Strategy, and (2) higher education reform in compliance with the Bologna process (Milutinović and Nikolić, 2014).

Altogether, Serbia has eight public and nine private universities, 47 state-funded colleges of applied studies and 17 private colleges of applied studies (European Commission, 2012). Institutions in three towns, namely, Belgrade, Niš and Kragujevac, are members of the COPERNICUS programme, which was initiated by The Club of the Rectors of Europe (CRE) in 1988. COPERNICUS, the Cooperation Programme in Europe for Research on Nature and Industry through Coordinated University Studies, includes European universities that show devotion towards sustainable development. According to the COPERNICUS programme, the priorities are the following: (1) an interdisciplinary approach towards sustainability and the related issues; (2) the promotion of life-long learning; (3) sustainable production and establishment of positive consumption patterns; (4) further qualification of teachers; (5) co-operation and networking; and (6) distance learning (Milutinović and Nikolić, 2014). At the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica, it is our long term goal to contribute to the membership of the University of Novi Sad in the COPERNICUS programme through the establishment of an adequate strategy of sustainable development.

Serbia has signed several international documents promoting education for sustainable development. The first and partial insight into the presence of ideas regarding sustainable development in Serbian higher education shows that the processes in favour of introducing sustainable development have started, although it is clear that its expansion is still inadequate (Pavlović, 2011).

In recent years, several faculties, departments, study programmes and study groups have been established within the field of the environment at the basic, masters and PhD levels of study. By

and large, the curricula that focus on the aspects of sustainable development still tend to be present among technical faculties, although more and more social sciences show interest in the issue. Lončar (2011) investigated the representation level of sustainable development among 10 social-humanistic faculties at the University of Belgrade in order to reveal how various institutions view the question of sustainable development in education, as well as how professors educate students approving of sustainable development. The conclusions of the research are, first, that no subjects related to sustainable development were found at the bachelors level, and second, that the number of syllabi explicitly mentioning the concept of sustainable development is extremely low. At various faculties in Serbia, education is most often executed *ex cathedra*, while education for sustainable development demands such methods as co-operative learning, informal methods of teaching, experience-based learning, and creative methods. These forms of learning, however, are rare among faculties in Serbia. The concept of sustainable development tends to be associated with ecology among social science and humanistic faculties in Serbia. Lecturers often consider the issue irrelevant for their courses and direct students towards ecological courses regarding the issue (Lončar, 2011).

Alongside the 14 faculties of the University of Novi Sad (one of them being the Hungarian Language Teacher Training Faculty in Subotica), there are also various university centres, one of them being the Association of Centres for Interdisciplinary and Multi-disciplinary Studies and Research (ACIMSI). ACIMSI has 11 university centres and is where the Centre for Sustainable Development and Environment was founded. The primary goal of the centre is to educate staff and carry out research that will contribute to the advancement of management and organization within the field of environment engineering, as well as helping to establish conditions for effective environmental protection in harmony with the concepts of sustainable development and the right of future generations for healthy environment.

The expected outcomes are (Centre for Sustainable Development and Environment, University of Novi Sad):

- multidisciplinary education of the lecturing staff for global and partial problem resolution in environmental protection
- reputable and high-quality education and research programmes within the field of environmental protection
- active co-operation between the Republic of Serbia and the European Union within the field of environmental protection
- advanced international and inter-university educational and research programmes
- technology and knowledge transfer from developed countries to the Republic of Serbia
- long term strategy development with regard to the education and research of environmental protection, harmonization with the law regulations and recommendations of the European Union.

The 14th and youngest faculty of the University of Novi Sad is the Hungarian Language Teacher Training Faculty in Subotica. The institution was founded on October 16, 2006. Teacher education has a long-standing and well-established tradition in Subotica, dating back to the first female teacher training institution founded in 1871, where the language of instruction was initially Hungarian, then Serbian and Croatian. This year, therefore, Subotica commemorates the 145th year of teacher education, whereas the Hungarian Language Teacher Training Faculty in Subotica celebrates its 10th anniversary.

The faculty currently offers four accredited educational programmes: a bachelors with Honors in pre-school education, a

bachelors with Honors in primary education, a masters of pre-school education and a masters of primary education. The bachelors degree takes four academic years to complete and the masters takes one. During their bachelors studies, students gain 240 ECTS points, while during masters studies they collect another 60 ECTS points.

The Hungarian Language Teacher Training Faculty in Subotica set a goal to become one of the first institutions to accept the challenge and thoroughly review its teaching content in order to adjust it to the theoretical and practical foundations of sustainable development. This research is an integral element of the project.

3. Research methodology

3.1. Research objective

For an institution to become a green university, the whole institution, including its management, work communities operating at the university, the lecturers and the technical staff must commit to the common goal. The principle values of sustainable development need to be enforced in every segment of the institution (Lozano et al., 2013).

The University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica formed a team for the purpose of becoming a green university. The first task of the team was to establish its work plan. Further tasks of the sustainability team included ensuring the following conditions based on the recommendations of the Hungarian Institute for Educational Research and Development, Hungary (Könczey et al., 2014):

- adequate human policy planning of the institution: further education, re-qualification, the employment of adequate experts;
- programme planning in the form of complex learning organization with regard to the topic of sustainability;
- long-term reform of institutional functioning (heating, water and electricity consumption), inner-space school re-formation;
- co-operation of Serbian and Hungarian central institutions;
- co-operation in network learning in favour of pedagogy for sustainability;
- the introduction of local natural and architectural values into institutional activities.

The purpose of the first, pedagogical level of preparations is performance analysis. The formation of an adequate curriculum is of key importance in the process of becoming a green university (Cotton et al., 2007).

One possible method for measuring the success of pedagogy for sustainability is to survey the influence on attitude changes among targeted groups of students. In reflecting on the research results, the sustainability team dedicated its attention and effort to curriculum reformation and the efficiency optimization of courses and their teaching methods.

The research goal system can be concluded according to the following aspects:

- Scientific objectives: define the environmental attitudes and degree of environmental consciousness of Hungarian teacher and pre-school teacher training students in Vojvodina based on the empirical research results.
- Practical objectives: map out the degree to which the institution's educational programme contributes to the positive formation of students' environmental attitudes and environmentally conscious behaviour, as well as viewpoints in favour of sustainability.

A questionnaire was used as a data collection instrument for longitudinal research. For four consecutive years, the environmental consciousness and environmental attitude level of students at the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica were measured.

3.2. Environmental attitude and its measurement

Environment consciousness is a form of behaviour that an individual or organization performs in favour of environmental problem resolution via their responsible and active participation (Lasso de la Vega, 2006; Akengin and Aydemir, 2012). Generally, it is the quality trait of actions that provide the behavioural foundations for the realization of sustainability (Mutisya and Barker, 2011; Ideland and Malmberg, 2015).

The relationship with and actions of humans towards the environment are determined by their lifestyle attitudes. Environmental attitudes signify how humans relate to their surroundings (Smit, 2009). This can be either positive or negative. The former implies careful, responsible and attentive responses to the environment by minimizing the negative effects on nature, while the latter implies negligence towards the environment and a lack of actions in favour of value protection.

Attitudes toward the environment are set up by knowledge, emotional approach and behaviour alongside cognitive (knowledge), affective (emotional) and connotative (behavioural) components (Marlowe and Woodrow, 1996; Kaiser et al., 1999; Flamm, 2009; Pruneau et al., 2006; Okur-Berberoglu, 2015). The cognitive component of attitudes is responsible for how the individual assesses the attitude subject and what knowledge they dispose of it. The affective component denotes the individual's positive or negative emotional reaction towards the attitude subject. Finally, the connotative component signifies the past, present and future behavioural habits towards the attitude subject (Fig. 1) (Fletcher et al., 2005). According to this model, knowledge acquired regarding the environment does not entail environmentally conscious behaviour (Hungerford and Volk, 1990). The knowledge-attitude-behaviour model, however, assumes that knowledge acquired about the environment triggers positive attitudes towards it, which results in environmentally conscious behaviour (Zimmermann, 1996). The cognitive system aspires for inner

consistency. If consistency is damaged by the acquisition of new knowledge (originating from personal experience, as well) a mechanism steps in to restore consistency, for instance, a change in attitudes. In favour of attitude change, the individual's pattern of behaviour is altered for the purpose of the attitude shift. Because the individual's behaviour is in conflict with his or her attitudes, a contradictory motivation emerges that triggers the attitude to shift (Bandura, 1979).

The knowledge of facts and attitudes alone is not sufficient to predict environmentally conscious behaviour and does not alter humans' relationship with nature (Vermier and Verbeke, 2006). There is not a one-to-one correspondence between attitude and behaviour (Alp et al., 2006; Johnson and Manoli, 2011); however, it can be stated that the relationship between behaviour and attitude is determined by two important factors. First, under certain circumstances, human behaviour can alter human attitudes. Second, if the relationship between attitude and behaviour can be predicted, attitudes may influence actions. Thus, neither in research nor in education is the goal to analyse and form attitude as its consequences; rather, the goal is define what determines attitude (Heyl et al., 2013).

Attitude research is carried out via direct questioning or observation during which the subjects' behaviour is under investigation. Indirect research methods may also be used (i.e., the subjects are interviewed upon their conditions and their physiological responses are analysed). The verbal report of a subject regarding his or her attitudes shows weak correlation with their actual behaviour towards the attitude subject. Therefore, attitudes cannot be measured directly, only their manifestations, which can also be examined directly and indirectly (Dawes and Smith, 1985).

3.3. Data collection

The first part of data collection consisted of 67 questionnaire items used each year between 2012 and 2015. The first eight items sought to reveal the background information of respondents. The next 59 items comprised a 5-point Likert-scale series of questions adapted into Hungarian from three different attitude measuring questionnaires. Because data collection was conducted among Hungarian speaking subjects, special emphasis is paid to previous research and surveys conducted in this language.

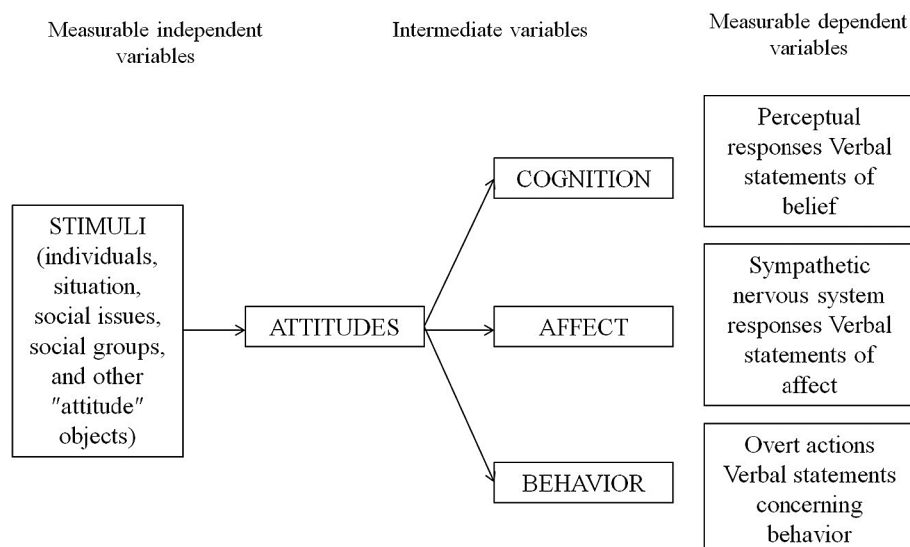


Fig. 1. Cognitive, affective and behavioural components of attitude (Rosenberg and Hovland (1960) cited by Fletcher et al., 2005).

(1) The Environmental Perception Test (EPT/ENV) (Table 1) was first published by Bogner and Wiseman (1999) and adapted into Hungarian by Gulyás (2004). The ENV scale consists of two main factors and five sub-scales that comprise four questions each: the utilization-factor sub-scales: (1) altering nature, (2) human dominance; the preservation-factor sub-scales: (3) intent of support, (4) enjoyment of nature, and (5) care with natural resources. All questions of the ENV-scale were applied by the present research.

The figures signal the average of points according to each question. Although the Likert-scale is a ranking scale, it is often regarded as an interval scale for the purpose of exploiting complex statistical procedures; thus, the addition of points becomes reasonable (Varga, 2004). Forty points could be achieved from item 8 at the utilization-scale. The environmental attitude of subjects is considered positive above the value 24 and negative below that value. The values of the preservation-scale fluctuate between 12 and 60 points and the neutral value is 36 points. The two axes of the sub-scale are between 5 and 20 points, and the neutral value is 12.5 points. The values of the total ENV-scale are between 20 and 100 points and its neutral value is 62.5. To avoid response automation, 8 items were reversely composed.

(2) The RevNEP-scale (Revised New Ecological Paradigm Scale) (Table 2) is a transformation of the original NEP-scale (New Ecological Paradigm Scale), re-designed by Dunlap et al. (2000), which was also adapted into Hungarian by Gulyás (2004). Considering all three questionnaires, the RevNEP-scale (before its transformation, the NEP-scale itself) is the internationally most frequently used environmental attitude measurement instrument among adult and young informants (Gadenne et al., 2011; Lucy and Milfont, 2010; Harraway et al., 2012; Jowett et al., 2014; Kuo and Jackson, 2014; Shephard et al., 2015b). In the framework of a four-year longitudinal study, Shephard et al. (2015a) tested the efficiency of the scales among university students of environmental studies regarding their attitudes towards the environment.

The RevNEP-scale can be divided into 5 sub-scales: (1) Limits to growth; (2) Antianthropocentrism; (3) Fragility of nature's balance; (4) Rejection of exemptionalism; and (5) Possibility of an eco-crisis. Considering the sub-scales, informants can achieve from 3 to 15 points. Above the neutral value of 9, positive attitudes towards the environment can be determined. The total RevNep scale values fluctuate between 15 and 75 points and its neutral value is 38 points. To avoid response automation, seven items were reversely composed.

(3) The CHEAKS scale (Children's Environmental Attitude and Knowledge Scale) (Table 3) was used as the third questionnaire, originally designed by Leeming et al. (1995) and adapted into Hungarian by Varga (2004). The scale consists of 24 items, out of which only the items targeting attitude measurement were applied during this research. The test consists of six sub-scales focusing on the following topics: general environmental questions, animals, plants, water, energy and waste. Each sub-scale includes four questions, two of which aim to reveal the emotional attitudes of the informant, while the other two measure behavioural attitudes. In the questionnaire adapted by Varga (2004), the original "contaminated" subscale was replaced by "plants". During the present survey, the latter version was used. The CHEAKS questionnaire was originally designed for children, but certain elements lack any age-specific nature that would prevent its application among informants aged 18–22 or even adults. In the case of the scale adapted into Hungarian, the applicability among older respondents was established by Kotogán (2011). Only one item had to be re-composed so that adults could also interpret it. The original question within the animals sub-scale was "I have asked my parents not to buy products made from animal fur", while the one used in the present survey was "I do not buy products made from animal fur". The application of the CHEAKS questionnaire was also justified throughout the four-year survey since the research results became comparable not only with the various scales conducted among

Table 1

The classification of the environmental attitude measuring items according to the ENV questionnaire^{a,b} (Bogner and Wiseman, 1999).

I. Utilization
Altering Nature
(1) Grass and weeds growing between pavement stones really looks untidy
(2) Weeds may be destroyed because they inhibit the full development of useful and ornamental plants
(3) A real nature fan brings home beautiful and rare plants when he/she has been out in the countryside
(4) I prefer a well-cared for lawn to a wild meadow where flowers grow in an unordered way
Human Dominance
(1) Construction of motorways and bypass roads is so important that it justifies the removal of forests and meadows
(2) To feed human beings, nature must be cleared, so that, for example, grain can be grown
(3) Since mosquitoes develop in ponds, it would be better to drain these and reclaim them for agriculture
(4) People should keep open air swimming ponds free from creepers and climbing plants
II. Preservation
Intent of Support
(1) If I ever get extra pocket money I will donate some money to an environmental organization
(2) Environmental protection is expensive. I am prepared to help out in a fund-raising effort
(3) When I am older I am going to join and actively participate in an environmentalist group should I already not be a member
(4) I often try to persuade others that the environment is an important thing
Enjoyment of Nature
(1) I have a sense of well-being in the silence of nature
(2) I really like to be able to go on trips into the countryside – for example to forests or fields
(3) I specially love the soft rustling of leaves when the wind blows through the treetops
(4) I would really enjoy sitting at the edge of a pond watching dragonflies in flight
Care with Resources
(1) I always switch the light off when I do not need it any more
(2) Whenever possible I take a shower instead of a bath in order to conserve water
(3) I make sure that during the winter, the heating system in my room is not switched on too high
(4) I purposefully walk short distances rather than asking for a lift in order to protect the atmosphere

^a The questionnaire items presented in this study are published in their original, English version used by ENV, RevNEP and CHEAKS, thus they were not re-translated from Hungarian into English.

^b Sentences in bold indicate items that were reversely composed in order to avoid response automatization.

Table 2

The classification of the environmental attitude measuring items according to the RevNep questionnaire (Dunlap et al., 2000).

The reality of limits to growth
(1) The earth is similar to a spaceship with very limited room and resources
(2) We are approaching the limit of the number of people the earth can support
(3) The earth has plenty of natural resources if we just learn how to develop them
Antianthropocentrism
(1) Humans have the right to modify the natural environment to suit their needs
(2) Plants and animals have as much right as humans to exist
(3) Humans were meant to rule over the rest of nature
The fragility of nature's balance
(1) When humans interfere with nature it often produces disastrous consequences
(2) The balance of nature is strong enough to cope with the impacts of modern industrial nations
(3) The balance of nature is very delicate and easily upset
Rejection of exemptionalism
(1) Human ingenuity will ensure that we do NOT make the earth unlivable
(2) Despite our special abilities humans are still subject to the laws of nature
(3) Humans will eventually learn enough about how nature works to be able to control it
The possibility of an eco-crisis
(1) If things continue on their present course, we will soon experience a major ecological catastrophe
(2) Humans are severely abusing the environment
(3) The so-called "ecological crisis" facing humankind has been greatly exaggerated

Table 3

The classification of the environmental attitude measuring items according to the CHEAKS questionnaire (Leeming et al., 1995 cited by Varga, 2004).

	Behaviour	Emotion
General	(1) I pay attention to news related to environmental protection. (2) I have not asked others what I can do to help reduce pollution	(3) I respect those who devote their money to environmental protection. (4) I am frightened to think that people do not care about the environment
Animals	(1) I do not buy products made from animal fur (2) I have put up a bird house near my home	(3) It makes me happy when I think about companies testing products on animals (4) It makes me sad to see houses being built where animals used to live
Plant	(1) When I am in a forest, I observe plants. (2) Wherever I go to an excursion, I often take some flowers home.	(3) I really love walking in forests. (4) I think leaves are beautiful in autumn.
Water	(1) I turn off the water in the sink while I brush my teeth to conserve water (2) I do not let the water facet run when it is not necessary	(3) I am not worried about running out of water (4) It upsets me when I see people use too much water
Recycling	(1) I have asked my family to recycle some of the things that we use (2) I do not separate things at home for recycling	(3) It makes me happy when people recycle used bottles, cans, and paper (4) I get upset when I think of the things people throw away that could be recycled
Energy	(1) I leave the refrigerator door open while I decide what to get out (2) To save energy, I turn off lights at home when they are not in use	(3) It makes me happy to see people trying to save energy (4) It frightens me to think how much energy is wasted

young adults but also children. Because the environmental attitudes of teachers and their pupils might show a correlation with one another, for the purpose of further comparison, the application of CHEAKS scale proved also proved to be justified.

In each sub-scale, the minimum score is four points, and the maximum is 20. Thus, 12 is the neutral value in this category. Values above 12 indicate positive environmental attitudes, whereas values under 12 indicate negative attitudes. The scales of emotion and behaviour also comprise 12 items, so the neutral value is at 36 points. Values above the neutral value indicate positive attitudes, and values under the neutral value indicate negative attitudes. By the summation of the attitude points, the total attitude scale values will be formed. In this case, the possible number of points fluctuates between 24 and 120 and the neutral value is therefore 72. To avoid response automation, six items were reversely composed.

The environmental attitude scale is strongly influenced by the informants' desire to live up to social expectations. The older one gets, the less they feel the pressure to conform to social expectations, so this factor is not so relevant among young adults between the age of 18–22 as it is among children (Gulyás and Varga, 2006, cited by Kotogán, 2011). The CHEAKS and ENV-scales investigate concrete actions, i.e., their research method is behaviour-oriented. The RevNep-scale, however, surveys general attitudes, so social conformation is not a relevant issue in this case in comparison to the previous two scales, where their presence is unavoidable (Gulyás, 2004). The joint application of the three questionnaires enabled the elimination of their weaknesses, and the

questionnaires therefore become adequate for the analysis of social factors that prove to be more subjective in relation to natural scientific research.

The attitude questionnaire of this research comprises the following groups of items:

- 20 items from the ENV-scale;
- 15 items from the RevNep-scale;
- 24 items from the CHEAK scale (items that investigate environmental attitudes).

In total, the questionnaire consisted of 59 environmental attitude questions based on 5-point Likert-scale items. The minimum number of points was 59 points and the maximum was 295. The neutral value was 118 points.

The reliability of the questionnaire was tested by Cronbach's Alpha with an average of 0.73 throughout all four years of testing, which confirms the reliability of the testing means.

3.4. Hypotheses

Based on our preliminary hypotheses, students dispose of positive environmental attitudes that are not affected by various background factors of the respondents. The education system, however, influences their scholarly successes. Accordingly, the following hypotheses have been formulated:

H1. The background variables of the sample do not influence the environmental attitude values.

H2. Students' environmental attitude values were above the neutral value according to each scale (ENV, RevNEP, CHEAKS) in all four academic years.

H3. Students' attitude values change according to their examination results in each academic year.

H4. Attitude values increase each year among students who were tested in each consecutive academic year by all three scales (ENV, RevNEP, CHEAKS) from the academic year of 2011/2012 until 2014/2015.

3.5. Sample

Students of the University of Novi Sad Hungarian Language Teacher Training Faculty in Subotica were the informants of the present research. It is the only faculty in Serbia that offers academic programmes exclusively in the Hungarian language. Such institutions cannot be found in any other neighbouring country of Hungary. The unique position of the institution is a crucial aspect of the present research; to be more specific, there is not an opportunity for a control group survey. The primary purpose of the survey is to provide an impact analysis regarding the issues of environmentally conscious behaviour and the pedagogy of sustainability. Thus, the objective of the survey is not to provide comparable results with any control groups.

Data collection was carried out in May of 2012, 2013, 2014 and 2015. During the four academic years (2011/2012, 2012/2013, 2013/2014 and 2014/2015), 804 students were enrolled in the programme, out of which 532 participated in the survey. In Vojvodina, the language of instruction for pre-service teachers and pre-school teachers at the Hungarian Language Teacher Training Faculty in Subotica is Hungarian exclusively. Consequently, the total number of teachers and pre-school teacher candidates who will teach in Hungarian in Serbia are tested upon their environmental consciousness.

Two dimensions of the sample were analysed:

- according to the first aspect of investigation, the responses of the total number of respondents were analysed (Table 4);

3.5.1. Background information of the sample

Various social-demographic factors of the informants can influence research results (Saraçlı et al., 2014), so background information of the sample was also collected to reveal its relevance regarding the research results.

- Gender: the 16% of the sample was male and 84% was female. This proportion reflects the gender rate of the faculty.

Table 4

Students participating in the research.

- according to the second aspect of research, responses of the number of students (N = 31) enrolled at the programme in the academic year of 2011/2012 was assessed throughout four consecutive academic years. Thus, the contribution of the four-year academic qualification to the environmental attitude formation of students was tested.

	Total number of students	Students participating in the research	%
2011/2012	201	126	23
2012/2013	206	119	23
2013/2014	217	142	27
2014/2015	180	145	27
Σ	804	532	100

- Age: students from all academic years participated in the survey and their average age is 22 years. No correlation was found between the age of respondents and their attitudes. Regarding environmentally conscious behaviour, the age factor has not proved to be relevant in other studies. According to Liere and Frank, 1981 and Diamantopoluos et al. (2003), the younger generation acts in an environmentally conscious way and has positive environmental attitudes, while according to Roberts (1996), this is true of the elder generation.
- Residence: 54% of the informants live in a village and 46% in a town. The residence factor has not shown any correlation with the environmental attitudes of the respondents.
- The highest educational level of the father: primary school: 19%; secondary school: 70%; college or university: 11%.
- The highest educational level of the mother: primary school: 19%; secondary school: 66%; college or university: 15%.
- Scholastic record: good/7 (N = 20, 4%); very good/8 (N = 192, 41%); exceptionally good/9 (N = 234, 50%); excellent/10 (N = 26, 5%).
- Favourite subject: language and literature: 32%; social sciences: 24%; natural sciences: 18%; arts and sports: 20%; methodology: 6%.

No correlation was found between the informants' background information and the ENVsubscale research results. Regarding the RevNEP subscale ($r = 0.11$ $p = 0.01$), CHEAKS subscale ($r = 0.24$ $p = 0.001$) and the total attitude scale ($r = 0.22$ $p = 0.001$), which year the informants attended had an influence on the research results. The scholastic records of the informants proved to be relevant in the case of the RevNEP subscale ($r = 0.14$ $p = 0.002$).

To summarize, considering the background information of the respondents, only two proved to have an influence on the research results, namely, the year the informants were attending and their scholastic records. Thus, hypothesis H1 has not been confirmed since there are factors that influence attitude values, i.e., it is not only the content of education that defines attitudes. Shepard and colleagues have arrived at the same conclusion (Shephard et al., 2015a). The two variables indirectly depend on the content of education, however, since differences in student responses are defined by their scholastic records and their year of study.

4. Results

4.1. Environmental attitudes of pre-service teachers and pre-school teachers studying in Hungarian in Vojvodina

One of the goals of the survey was to determine the environmental attitude of students. According to our hypotheses, the environmental attitude of students will be positive based on the result of all three scales (ENV, RevNEP, CHEAKS). The hypothesis, however, has not been confirmed regarding any of the scales in any of the 4 years of surveys.

4.1.1. Attitude values measured by the ENV scale

As stated in hypothesis H2, the environmental attitude of students was positive throughout 4 years of surveys based on each ENV scale. More specifically, the values are positive in case of the prevention factor (P) and total ENV scale, but not positive for the application factor (A).

Considering the total A-factor, the environmental attitude values are negative in the case of the survey conducted in the third and fourth years (less than 23 points, in comparison to the neutral value of 24 points). The values also prove to be negative in the second, third and fourth years of the survey with regard to the sub-scale of the A-factor. The sub-scale of “interference with nature” in the second, third and fourth years of the survey and the sub-scale of “the priority of human race” in the second and fourth years of the survey were also negative.

The P-factor was positive in all four years of surveys. Regarding the total ENV scale, values were also positive throughout all four years of surveys (Table 5).

4.1.2. Attitude values measured by the RevNEP scale

The results of the RevNEP scale show that students achieved negative scores in each sub-scale. Out of 5 sub-scales, 2 proved to be negative in several years of surveys.

With respect to the sub-scale of “fragility of nature's balance”, students scored below the neutral value in the third and fourth years of the survey, and in case of the sub-scale of “rejection of exemptionism”, scores were also below the neutral value in the second and third years of the survey. For the other three sub-scales (“limitations to growth”, “antanthropocentrism”, “possibility of an ecocrisis”), and the total RevNEP scale, scores were positive in all four consecutive years of surveys (Table 6).

4.1.3. Attitude values measured by the CHEAKS scale

H2 has not been completely confirmed according to the results of CHEAKS scale. The informants achieved negative scores in the sub-scale of plants in the second and third years of the survey, as well as in the sub-scale of waste in the third year of the survey.

Regarding all the other sub-scales (emotion and behaviour) and the total CHEAKS scale, the informants scored above the neutral value, so they prove to have positive environmental attitudes (Table 7).

4.1.4. Attitude values measured by all scales

Considering the total 59-item scale, it can be determined that the informants' environmental attitude values were above the neutral value of 118 throughout the four consecutive years of surveys. The values were the highest in the first year of survey, 216.22 of the maximum of 295 mean scores. Over the next 2 years, the values declined, and in the last year they rose, but did not reach the

value of the first year. The results are presented in Fig. 2.

Hypothesis H2, according to which the environmental attitude of students participating in the present research will be above the neutral value for the total of the ENV scale, RevNEP scale, CHEAKS scale and on the whole of the 59-item scale throughout all four years of survey, has been confirmed. With regard to the sub-scales, the attitude towards the preservation of nature, limits to growth, antanthropocentrism, possibility of an ecocrisis, emotional and behavioural attitudes towards the environment, as well as general environmental questions in connection with animals, water and energy proved to be positive among the informants.

Nevertheless, certain sub-scale scores did not confirm statement of H2. Sub-scale scores of environment utilization, altering nature and human dominance do not exceed the neutral value. Informants tend to perceive the balance of nature unrealistically, and they agree with the dominance of the human race. Negative attitudes were detected regarding endangered plants and the harmful effects of waste.

4.1.5. Comparison of examination results and attitude values

The higher education system in Serbia applies the ECTS/ESPB system (European Credit Transfer System/Evropski system prenosiva bodova) in compliance with the Bologna reforms. In addition, a grading system from 6 to 10 is also used (grade 6 signifies sufficient, grade 7 stands for good, grade 8 means very good, grade 9 denotes exceptionally good, while grade 10 represents excellent).

There were 90 compulsory and 80 elective courses in the academic years of 2011/2012 and 2012/2013, and 78 compulsory and 117 elective courses in 2013/2014 and 2014/2015 for all students and in both academic programmes (the teacher training and pre-school teacher training programmes) at the Hungarian Language Teacher Training Faculty in Subotica (Table 8).

The courses were divided into 5 groups based on the faculty's fields of study, and the following groups were therefore formed: (1) language, literature and communication, (2) social sciences, (3) natural sciences, (4) arts and sports, and (5) methodologies.

Throughout the four consecutive years of the survey, the students achieved the highest grades in courses that belong to the group of arts and sports, while the lowest grades were gained in the group of language, literature and communication. The courses of natural sciences and methodologies have shown similar fluctuations throughout the four consecutive years of the survey, namely, a decline in exam grades was detected in the academic year of 2012/2013, then rose in the subsequent academic year, and then declined again.

The scholarly achievements of students were similar in the first and fourth academic years. Scores were lowest in the academic year of 2012/2013, and the highest in 2013/2014. Nevertheless, the attitude values depict a different image in these academic years.

Table 5

Attitude values measured by the ENV scale.

Sub-scales	2011/2012		2012/2013		2013/2014		2014/2015		neutral value
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
Utilization factor	25.4	4.5	24.4	3.6	22.4	2.6	22.6	4.4	24
1. Altering nature	12.3	3.3	12.3	2.6	9.6	1.6	10.6	2.8	12.5
2. Human dominance	13.1	3	12.1	2.2	12.8	1.7	11.9	3	
Preservation factor	47.3	7.8	44.9	5.8	41.8	4.9	46.6	7.4	36
3. Intent of support	14.8	3.4	14.4	2.9	13	2.5	14.9	3.6	12.5
4. Enjoyment of nature	16.7	3	15.7	2.6	14.4	2.6	16.1	3	
5. Care with nat. resources	15.9	3.1	14.7	2.8	14.3	2.4	15.6	2.8	
Total ENV-scale	72.8	9.5	69.4	6.9	64.2	4.6	69.2	7.7	62.5

Table 6
Attitude values measures by the RevNEP scale.

Sub-scales	2011/2012		2012/2013		2013/2014		2014/2015		neutral value
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
Limits to growth	10.4	2.1	9.8	2.7	11.2	1.8	10.1	2.5	9
Antianthropocentrism	10.7	2.6	9.9	2.3	10.6	2.1	9.9	2.5	
Fragility of nature's balance	9.7	2.8	9.5	2.5	7.8	2	8.5	2.4	
Rejection of exemptionalism	9.8	2.1	8.8	2.1	8.4	1.8	9.1	1.9	
Possibility of an ecocrisis	12.1	2.3	11.5	2.7	13.1	1.6	12.3	2.5	
Total RevNEP scale	52.9	6.7	49.5	5.4	51.3	3.7	49.9	6.8	38

Table 7
Attitude values measured by the CHEAKS scale.

Sub-scales	2011/2012		2012/2013		2013/2014		2014/2015		neutral value
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
General	15.3	2.6	15.3	2.4	14.6	1.8	15.5	2.2	12
Plants	13.9	5.3	11.5	5.2	8.1	2.9	12.3	5.5	
Animals	15.2	2.8	15.3	2.2	15.3	1.9	15.4	2.5	
Water	16.7	2.7	16.9	2.4	17.3	2.5	17.1	2.5	
Waste	14.7	3.1	12.7	2.4	11.3	1.9	13.6	3.2	
Energy	14.4	3.2	13.5	3.5	12.1	1.6	14.2	3.3	
Emotion sub-scale	46.4	8.6	43.1	8.2	38.2	3.7	44.8	8.8	36
Behaviour sub-scale	44	5.5	42.2	5.4	40.6	3.2	43.5	5.1	
Total CHEAKS scale	90.5	12.9	85.5	12.4	78.8	5	88.5	12.8	72

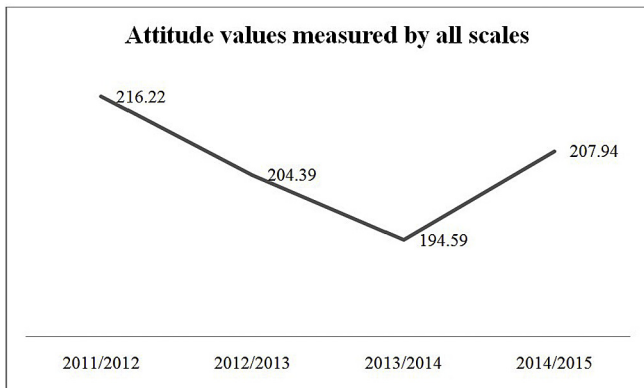


Fig. 2. Attitude values measured by the total 59-item attitude scale.

Table 8
Number of courses in the academic years of the survey.

	2011/2012 and 2012/2013		2013/2014 and 2014/2015	
	compulsory course	elective course	compulsory course	elective course
1st year students	20	9	16	18
2nd year students	21	24	16	30
3rd year students	30	21	22	31
4th year students	19	27	24	38
total	90	81	78	117

Accordingly, the highest scores on the environmental attitude scales were achieved in the academic year when the scholarly achievements were the lowest, i.e., 2013/2014 (Table 9).

Based on the argumentation above, hypothesis H3 has not been confirmed, namely, students' environmental attitudes do not show parallel distributions with their scholarly achievement. Thus, it is not a valid statement that elements of sustainability could be efficiently integrated into the educational areas in which students are

Table 9
Comparison of the average examination results and environmental attitude values.

Academic year	Average examination results	Average attitude values
2011/2012	8.97	216.22
2012/2013	8.43	204.39
2013/2014	9.16	194.59
2014/2015	8.97	207.94

successful.

4.2. Alterations of environmental attitude throughout four consecutive years of the survey

The second aspect of our research was the longitudinal investigation of students' environmental attitudes; to be specific, the

goal was to reveal whether the four-year academic qualification contributed to the development of environmental attitudes. According to our hypothesis, a rising tendency of environmental attitudes will be detected based on the results of the three scales (ENV, RevNEP, CHEAKS) from the first academic year (2011/2012) of survey to the last one (2014/2015). This hypothesis has been confirmed by the CHEAKS scale and the total 59-item scale, i.e., attitude values were higher in the fourth year of university studies

than in the first one. The increase is not steady, however, since a decline of values was detected in the second and third years of university studies on each scale (Table 10).

Thus, in its present form and condition, the four-year university study provides adequate knowledge and information that contributes to the development of environmental attitudes only in its 4th academic year. Shepard and colleagues have arrived at a similar conclusion (Shephard et al., 2015a). Based on the research results, it is necessary to widen the curricular system with elements of pedagogy for sustainability.

Further analysis provides a comparison of scores according to sub-scales throughout the four consecutive years of the survey.

4.2.1. Attitude values measured by the ENV-scale

Tukey's-b test was applied in order to analyse significant differences of values among data that were collected in four consecutive years. Statistically significant differences were detected among the following scales:

- “altering nature” sub-scale ($F = 16.1$ $p = 0.001$): [2012, 2013]>[2014, 2015]
- “human dominance” sub-scale ($F = 6$ $p = 0.01$): [2012, 2013, 2014]>[2015]
- “enjoyment of nature” sub-scale ($F = 3.5$ $p = 0.1$): [2015]>[2012, 2014]>[2013]
- utilization-factor ($F = 14.1$ $p = 0.001$): [2012, 2013]>[2014]>[2015]
- preservation-factor ($F = 4.1$ $p = 0.008$): [2015]>[2012, 2014, 2013]

It can also be observed that only the sub-scale of “enjoyment of nature” and the preservation-factor attitude values were the highest in the final academic year of the survey. According to the values measured by the ENV scale, the environmental attitude values did not rise in all cases regarding each year of survey.

4.2.2. Attitude values measured by the RevNEP scale

The environmental attitude values of informants showed a value change in three sub-scales measured by the RevNEP scale throughout the four years of the survey:

- “limits to growth” sub-scale ($F = 4.9$ $p = 0.03$): [2012]>[2014, 2015]>[2013]
- (e) “possibility of an ecological crisis” sub-scale ($F = 6.9$ $p = 0.001$): [2012, 2014, 2015]>[2013]
- total RevNEP scale ($F = 3.7$ $p = 0.01$): [2012, 2014, 2015]>[2013].

In 2013, each sub-scale showed lower values in comparison to the values of every other year.

In the case of the scores of the RevNEP scale during the first and fourth years of survey, the attitude values show no statistically confirmed differences. Thus, in this case, hypothesis H4 cannot be confirmed, since the attitude values of the informants did not show a significant increase by the end of their university studies.

4.2.3. Attitude values measured by the CHEAKS-scale

- Regarding the analysis of the sub-scale results of the CHEAKS questionnaire, the following differences were observed in various years of survey:
- plant sub-scale ($F = 3.5$ $p = 0.01$): [2014]<[2012, 2013]<[2015]
- water sub-scale ($F = 3.5$ $p = 0.01$): [2013]<[2012, 2015]<[2014]
- waste sub-scale ($F = 3.2$ $p = 0.02$): [2012, 2013, 2015]<[2014]
- energy sub-scale ($F = 6.4$ $p = 0.001$): [2013, 2014, 2012]<[2015]
- behaviour factor ($F = 7.1$ $p = 0.001$): [2013, 2012, 2014]<[2015]
- emotion factor ($F = 4.7$ $p = 0.004$): [2012, 2013, 2014]<[2015]
- total scale ($F = 7.4$ $p = 0.001$): [2013, 2014, 2012]<[2015]

Except for the sub-scales of water and waste, in each case, the highest values were detected in the last academic year of the survey, namely, in 2014/2015.

In the case of the CHEAKS scale, the two-sample *t*-test confirmed H4 in three cases, i.e., an increase in attitude value was detected between the first and fourth years of survey. Thus, by the end of the four-year university studies, an attitude value increase can be observed regarding the scores in the case of general environmental questions ($t = -2.5$ $p = 0.01$), the behaviour factor ($t = -2.8$ $p = 0.01$), and the total attitude scale ($t = -2$ $p = 0.04$).

5. Discussion

The research of the Sustainability Team at the University of Novi Sad, Hungarian Language Teacher Training Faculty in Subotica was successful in terms of its goal to reveal the efficiency of its study programmes in the development of environmental attitudes. Nevertheless, the level of environmental attitude and environmental consciousness of pre-service teachers and pre-school teachers (who will teach in Hungarian) in Vojvodina were also determined. The initiative itself is not new; Shepard and colleagues (Shephard et al., 2015a) have already emphasized the impact analysis of higher education systems on the field of environmental consciousness. To date, no longitudinal research has been published in the field of environment consciousness in a teacher training higher educational institution. Thus, the present research results offer a unique insight into the environmentally conscious behaviour of an institution in Serbia that offers an exclusively Hungarian academic programme. The students of the faculty arrive from various territories of Vojvodina in order to exercise their minority right to science, education and culture, i.e., study in their mother tongue in accordance with the European standards of education.

It can be concluded that regarding all scales (ENV, RevNEP and CHEAKS), the informants' environmental attitude values are above neutral value throughout all four years of the survey; however, negative attitude values can be observed in several subscales. There are also topics that must be re-visited and further knowledge expansion is required. Positive attitudes and behaviour towards the environment, as well as commitment towards environmental protection among students, allow for the assumption that the

Table 10

Attitude values measured by the main scales in the case of the longitudinal group.

Sub-scale	2011/2012		2012/2013		2013/2014		2014/2015		neutral value
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
ENV scale	69.4	9.2	67.7	3.6	65.4	4.2	67.3	5	62.5
RevNep scale	52.8	6	48.9	5.4	52.1	3.6	50.9	4.5	38
CHEAKS scale	83.3	10.2	79.6	5.7	80.22	4.5	89.3	12.4	72
Total scale	205.6	18.9	196.1	9.2	197.8	7.9	207.8	13.4	118

adequately organized education and environmental education prepares pre-service teachers in Vojvodina to become teachers committed to the principles of sustainability.

Regarding the efficiency of the institution's educational system, the conclusion was reached that it is already possible to achieve environmental attitude development in its current form in the first cycle of academic studies. In the future, however, it will be necessary to improve the efficiency of the curriculum and methodologies of teaching. It is highly advisable to establish a relationship between the various competences and encourage interdisciplinary study. It will be crucial to integrate the principles of sustainability into the system of courses and organize extra-curricular activities accordingly. [Milutinović and Nikolić \(2014\)](#) also examined the position of sustainability in Serbian higher education and arrived at the conclusion that although various implementation efforts have been made, it is still in the development phase. The authors have also emphasized the importance of training the educators (Education of educators for sustainable development) and the professional development of curricula.

Quality improvement initiatives have already been launched at the faculty with regard to pedagogy for sustainability ([Sammalisto et al., 2015](#)). Parallel to the establishment of the Sustainability Team in the academic year of 2015/2016, the Sustainability Workshop started regular consultations on the basis of the 10 talent nurturing workshops. The overall goal of the workshop is to develop knowledge about environmental behaviour and sustainability and establish a relationship between social scientific contents and their teaching methodologies based on the pre-service teachers' own experimental research, as well as developmental workshops organized for pupils with the purpose of transferring the principles of sustainable development. Within the frameworks of the workshop, the Hungarian Language Teacher Training Faculty in Subotica joined European Sustainable Development Week. The objective of the programme is to provide a Europe-wide common platform for civil organizations, local governments, cultural institutions, research institutions and others to demonstrate how they contribute to sustainable development, as well as also to show their commitment to one of the 17 goals of Sustainable Development proposed by the United Nations ([Beynaghi et al., 2016](#)). The fourth goal is relevant for our institution, i.e., ensuring inclusive and quality education for all and promoting lifelong learning. Therefore, in 2016, our institution organized a series of programmes disseminating the principles of sustainable development.

We plan to form an intensive programme addressing the topic of sustainable development within the framework of the institution that focuses on experience-based activities, realized in natural and social environments via traditional and virtual forms of education. [Viegas et al. \(2016\)](#) have also emphasized the relevance of similar activities in their research. The target groups are pre-service and in-service teachers. The efficiency of the programme and the research results will be presented traditionally, as well as innovatively, specifically, in the form of a MOOC (Massive Open Online Course), which primarily emphasizes online and video-based education but also contains interactive elements. This form of education enables fast and effective knowledge transfer within and without our institution. [Milutinović and Nikolić \(2014\)](#) have also emphasized the importance of higher educational co-operation in favour of more successful implementation of sustainability.

The aims of our endeavours is to establish an efficient educational institution based on the principles of sustainability that reacts to the challenges of the society with innovative methods. Through the application of online-based tools, the institution contributes to the development of pre-service teachers' environmental consciousness. In doing so, future teachers will be enabled to attend to their environmental education tasks, the application of

various methods in practice, and prepare the future generations for various global challenges.

It is crucial for our institution that its lecturers do not operate as solitary individuals, but work and co-operate as a team and with the teachers of various pre-school and primary school institutions ([Anand et al., 2015](#); [Holm et al., 2015](#); [Sammalisto et al., 2015](#)). This year, our faculty realized 17 accredited further qualifications for in-service teachers. One of these courses was the Theory and Practice of Environmental Education. The aim of the course was to achieve realization among in-service teachers regarding the importance of Environmental Education and gain experience and practice in its scholarly realization and organization. Applying the principles of the methodology of Environmental Education, in-service teachers will be able to form the approach of primary school pupils towards the environment. In accordance with the research results of [Zsóka et al. \(2013\)](#), which were conducted in the neighbouring country of Hungary, we believe that workshops, courses and other activities address students who are already committed to their environment, while the less motivated students prove to be neglected. This is one of the drawbacks of elective courses, as environmental education is usually among the elective courses in undergraduate academic programmes ([Lozano et al., 2015](#); [Verhulst and Lambrechts, 2015](#)).

6. Conclusions

The purpose of the present research was to examine the possibilities of our higher educational institution regarding sustainability education among Hungarian teacher training students in Vojvodina.

According to the research results, there are various opportunities in our current curricula that provide opportunities for developing the necessary skills and key competences in favour of establishing sustainable development.

Meanwhile, the research results not only demonstrate high relevance for the institution but also underline the features of the Hungarian minority community in Serbia from the perspective of environmental consciousness. In addition, the research also provides an example for other teacher training faculty in Serbia and other neighbouring countries of Hungary that are inhabited by Hungarian minority communities with regard to the development of educational programmes encouraging the pedagogy of sustainability.

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