The Importance of Nature Protection Areas for Conservation Education: The Case of Kozjansko Regional Park in Slovenia

Gregor Torkar¹ PhD; Sanja Valenčak² Msc.
Faculty of Education, University of Ljubljana, Slovenia¹,²
gregor.torkar@pef.uni-lj.si¹, sanja.valencak@gmail.com²

Abstract: Nature protection areas play an important role in ensuring people’s direct contact with nature, especially in developed countries, where pristine natural environments are rare, scattered, and disappearing. Empirical and theoretical evidence support the role of nature in cognitive, affective, and value-related development among children and adolescents. This article examines the effectiveness of educational activities for primary school students in Kozjansko Regional Park (Kozjanski regijski park) in southeast Slovenia. The main research goal was to investigate students’ knowledge and attitudes towards the park’s natural and cultural heritage. A questionnaire was developed and administered to students at all six primary schools within the park. Next, semi-structured interviews with park staff and primary school teachers were conducted in order to set standards for future collaboration and development of educational activities. The results show that the 236 participating students had moderate knowledge about the natural and cultural heritage of the park even though the majority had positive attitudes toward natural and cultural heritage. There was a weak positive correlation between students’ knowledge about and attitudes toward natural and cultural heritage. There was no correlation between students’ attitudes toward natural and cultural heritage and their overall academic performance or grades in biology and science. Female students had more positive attitudes toward natural and cultural heritage; they also showed more interest in biology and science subjects at school. Sex differences in knowledge were not significant. The park staff reported that their main goal was to educate and orient students toward nature protection. The teachers find their collaboration with the park managers satisfactory and they share mutual educational goals. They would like to continue this good cooperation. Students should have regular opportunities to explore their local natural environments, to learn more about natural and cultural heritage, and to be actively involved in preparing and carrying out conservation activities. It is also important for teachers to make biology and science education more exciting and meaningful for students to increase their interest.

Keywords: school education, knowledge, attitudes, nature protection, teacher, Slovenia.

Introduction

Nature protection areas play an important role in ensuring people’s direct contact with nature, especially in developed countries, where pristine natural environments are rare, scattered, and disappearing. Empirical and theoretical evidence support the role of nature in cognitive, affective, and value-related development among children (Kahn, Kellert, 2002). Conservation education is a relatively unknown term, especially in Europe. Conservation education focuses on nature and natural resources, and emphasizes capabilities to solve environmental problems. Conservation education programs are meant to help people understand these issues and develop an ethic that will support a host of conservation behaviors (Jacobson, McDuff…, 2007). Various authors also stress that many school programs include environmental topics, but too few focus on achieving conservational goals. Conservation education shares many goals with environmental education, providing learners with the opportunity to gain environmental awareness, knowledge, attitudes, and skills and to participate in problem-solving (UNESCO, 1978). According to J. Palmer, B. Bajd, D. Mati, and E. Tsaliki (Palmer, Bajd…, 1998), formal programs in environmental education alone are not effective enough for educating young people on how to save the planet. Studies suggest that there is a need to establish an education system including formal and informal programs. J. Palmer and J. Birch (2003) stressed the importance of informal environmental education, including communication and information, which results from living and interacting in a particular locality and community, using newspapers, television, radio, other media, and “events” in an individual’s life and the wider world, and interacting with other people and, last but not least, the natural world. This is in fact “place-based education” about which P. McInerney, J. Smyth, and B. Down (2011, 5) wrote that it “creates opportunities for young people to learn about and care for
ecological and social wellbeing of the communities they inhabit and the need to connect schools with communities as part of a concerted effort to improve student engagement and participation”.

The Slovenian Nature Conservation Act of 1999 defined biodiversity conservation measures and a system for the protection of valuable natural features for the purpose of contributing to nature conservation. According to the act, the following management categories were included: national parks (equivalent to Protected Areas Categories System (IUCN) - protected area management category II), regional parks (equivalent to IUCN protected area management category V), nature parks (equivalent to IUCN protected area management category V), strict nature reserves (equivalent to IUCN protected area management category Ia), nature reserves (equivalent to IUCN protected area management category IV), and natural monuments (equivalent to IUCN protected area management category III) (IUCN, 2015). Kozjansko Regional Park is one of the oldest and most extensive protected areas in Slovenia. It was established in 1981 as Trebče Memorial Park. The main reason for establishing the park originates from the historical heritage of this area. The mother of the former Yugoslav leader Josip Broz (Tito) was born in the area, and Josip Broz spent part of his childhood there. In 1999, the park was renamed Kozjansko Regional Park. According to the Nature Conservation Act (Zakon o ohranjanju..., 1999), a regional park is an extensive area of ecosystems and landscapes characteristic of the region with large portions of nature in its original state and areas of valuable natural features mixed with parts of nature where human influence is relatively large but in harmony with it. The park covers 206 square kilometers in southeast Slovenia. It has the status of a regional park and is a mix of rich cultural heritage and preserved biodiversity (Ploštajner, Zakonjšek, 2012). The current landscape of the park consists of a picturesque cultural landscape. With their persistence and creative power, people have imprinted typical features of land use in today’s park. The forests, riparian vegetation along the waterways, orchards, and exceptional vegetation of high dry grasslands are the essential landscape elements of this protected area (Ploštajner, 2010).

Studies exploring the educational benefits of school visits to nature parks are limited, particularly from the perspective of those shaping the educational experience. Empirical and theoretical evidence support the role of nature in the cognitive, affective, and value-related development of children. S.Nundy (1999) emphasized the relationship between cognitive and affective influences and argued that they are intertwined and provide a bridge to higher-order learning. Most research has been carried out with secondary school students: visiting nature parks, education centers, and natural or urban places. These studies mostly used quantitative evaluation for academic or affective consequences. O. Magntorn and G. Hellden (2007) report that thirteen- and fourteen-year-old students perceive fieldtrips as a significant contribution to learning about ecology because the students can explore, discuss, and link theory to practice. The most effective learning experiences are those that integrate outdoor and reflexive classroom learning (Ballantyne, Packer, 2002; Ballantyne, Packer, 2009; Ballantyne, Anderson, Packer, 2010). I. Ali (2002) states that in the past education experts have narrowly viewed their domain of operation as the “school” with its set curriculum, whereas nature conservation experts have viewed parks as their major concern, having little to do with children at school. He is certain that there is a bridge between the two disciplines, and the tragedy is that it is not being used enough (Ali, 2002). A. Lugg and D. Slattery (2003) examined the educational objectives and roles of teachers and park staff involved in environmental education through outdoor activities offered by national parks in Victoria, Australia. The authors report that teachers often lack the environmental knowledge and skills needed to teach some aspects of the curriculum, thus making the role of the park staff particularly significant in educating teachers as well as students.

**Aims.** This case study from Slovenia was used to endorse the role of nature protection areas in the school curriculum and the development of conservation education programs. The aim was to study the effectiveness of educational activities for primary school students in Kozjansko Regional Park. The main scopes of the current research were:

- to investigate students’ knowledge and attitudes regarding the park’s natural and cultural heritage;
- to investigate students’ interest in biology and science;
- to investigate the impact of students’ interest and sex on their knowledge and attitudes regarding the park’s natural and cultural heritage;
to explore the opinions of teachers and park staff on conservation education outcomes and their collaboration.

Methodology

Sample. The sample consisted of 236 students (114 male, 122 female) eleven to fifteen years old from all six primary schools located in the park. In addition, six science and biology teachers (all women) and two park staff members (both men) were interviewed. All of the students had attended conservation education program activities in the park at least twice in the past two years.

Instruments. Knowledge test and a questionnaire were developed for the purpose of this study, asking students about their knowledge and attitudes regarding the natural and cultural heritage of Kozje Regional Park. To form questions for the knowledge test, educational materials produced by park staff were studied. In addition, semi-structured interviews were conducted with teachers and park staff, and, as a result, conservation education outcomes were identified and measured.

Procedure. The data were collected in 2013 and 2014. Interviews with park staff and teachers were conducted in advance. Students completed a test and a questionnaire in the schools. Students were reassured that the questionnaire was anonymous and that it was not a test, but rather research to explore their attitudes towards natural and cultural heritage. The second author was present during the data-collection process in order to provide a few introductory remarks concerning the purpose of the study.

Data analysis. Descriptive and inferential analysis of the questionnaire results was carried out. The differences between variables were tested using Student’s t-test and Spearman’s rank correlation test.

Results and discussion

Our main goal was to investigate students’ knowledge and attitudes regarding the natural and cultural heritage of Kozjansko Regional Park in Slovenia. The participating students were residents of the park and therefore very important for sustaining the traditional interaction of people and nature in the future. Past and present human-nature interaction has produced an area with a distinct character with significant, ecological, biological, cultural, and scenic value. Safeguarding the integrity of this interaction is vital for protecting and sustaining the area and its associated nature conservation and other values (IUCN, 2015).

The results show that students had moderate knowledge about natural and cultural heritage (Figure 1). Students showed very little knowledge when answering Question 13, which asked them to name the woody plant in a photograph. This plant was described in educational materials developed by the park staff. The majority knew the answers to questions that asked students to name the most typical natural

![Figure 1. Percentage of correct answers on a knowledge test about natural and cultural heritage.](image-url)
feature (Question 2), the best-known fruit trees (Question 3), and selected plants that do not grow in dry meadows (Question 8). For the other knowledge questions, which asked students about the park’s territory (Question 1), protected animal species (Question 11), cavity-nesting birds (Question 4), orchards (Questions 5 and 6), meadow plants (Question 8), deciduous forests (Question 9), linden tree characteristics (Question 10), and tree heritage (Question 12), approximately two out of three students answered correctly.

The majority of students had positive attitudes toward natural and cultural heritage. However, some students showed little interest in biology and science. Each successive TIMSS assessment showed a strong positive relationship between student attitudes toward science and their science achievement. The relationship is bidirectional, with attitudes and achievement mutually influencing each other (Martin, Mullis…, 2012). Our results showed a weak positive correlation between knowledge about and attitudes toward the park’s natural and cultural heritage ($\rho = 0.152, p = 0.048$) and no significant correlation between student’s knowledge about natural and cultural heritage and their interest in biology and science ($\rho = -0.05, p = 0.517$). However, there was a moderate correlation between student’s attitudes toward natural and cultural heritage and their interest in biology and science ($\rho = 0.419, p < 0.001$) (Figure 2). These findings are useful for further development of educational activities in Kozjansko Regional Park and other similar nature protection areas. Students should have regular opportunities to explore their local natural environments because this improves their attitudes toward natural and cultural heritage. Similarly, A. Uitto, K. Juuti, J. Lavonen, and V. Meisalo (2006) found that out-of-school nature experiences were the most important factor that correlated with an interest in biology for Finnish secondary school students.

The results show a significant correlation between student’s knowledge about natural and cultural heritage and their overall academic performance ($\rho = 0.274, p < 0.001$) and grades in biology or science subjects ($\rho = 0.216, p < 0.001$). There was no significant correlation between student’s attitudes toward natural and cultural heritage and their overall academic performance ($\rho = 0.071, p = 0.278$) or their grades in biology and science subjects ($\rho = 0.116, p = 0.074$). Female students had more positive
attitudes toward natural and cultural heritage ($t = 3.463, p < 0.001$). They also showed greater interest in biology and science ($t = 3.479, p < 0.001$), which was also reported by P. Prokop, G. Tuncer, and J. Chzda (2007). Sex differences in knowledge were not significant ($t = -0.480, p = 0.632$). Similarly, G. Torkar, P. Mohar, T. Gregorc, I. Nekrep, and M. Hönigsfeld Adamič (2010) reported that female students more strongly disagreed with statements expressing opposition to otter conservation than male students.

B.E. Crocker (cited in Lugg, Slattery, 2009) emphasized that a park visit must be a two-way process, carefully planned by the teacher and park staff, and taking into account the needs of the students and the knowledge of the teacher and the park staff. Kozjansko Regional Park staff reported that their main goal was to educate and encourage students regarding nature protection. They offer excursions, summer camps, theme days, workshops, and experiential nature trails for students. They also help teachers mentor promising students in research. The teachers interviewed find collaboration with the park staff important because they share mutual educational goals. They said that cooperation is based on a certain reciprocity. That is to say, the park staff is willing to help offer a conservation education program for students. Teachers include a conservation education program in their school curriculum every year. On the other hand, schools help park staff with various public events (i.e., students singing at the events). The best-known one is in October each year: the Kozje apple festival, at which schools also present their conservation work. The teachers would like to continue collaborating in the future.

Conclusion and implications

The results of this study lead to the following main conclusions. First, the results showed a weak positive correlation between students’ knowledge and attitudes regarding the park’s natural and cultural heritage. Second, there was no significant correlation between students’ knowledge about natural and cultural heritage and their interest in biology and science. There was a moderate correlation between students’ attitudes toward natural and cultural heritage and their interest in biology and science. Students’ attitudes toward natural and cultural heritage had no correlation with their overall academic performance or grades in biology and science subjects. Female students had more positive attitudes toward natural and cultural heritage and showed more interest in biology and science subjects. Park staff and teachers reported that their main goal was to educate and encourage students regarding nature protection. They find a mutual interest in collaborating and would like to continue doing so in the future.

The network of nature protection areas is not only a sanctuary for rare species and habitats, but also an important recreation area to satisfy the physical, emotional, mental, aesthetic, and spiritual needs of human development. Therefore, we should provide regular opportunities for students to explore their local natural environments, to learn more about natural and cultural heritage, and to be actively involved in preparing and carrying out conservation activities. It is also important that teachers make biology and science education more exciting and meaningful for students to heighten their interest and so that they consequently actively engage in nature conservation.

Bibliography