



Evaluating the impact of the Earthkeepers Earth education program on children's ecological understandings, values and attitudes, and behaviour in Cyprus



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ABSTRACT

The recent educational reform in Cyprus moved education about sustainability to the forefront of environmental learning. The present study examines the impact of an earth education program, Earthkeepers, on children's ecological understandings, environmental values and attitudes, and behaviour. The program was implemented during two consecutive years with 491 4th to 7th graders from nine different schools in Cyprus. Quantitative data were collected using individual concept, attitude and behaviour questionnaires, and a satisfaction survey. Qualitative data were collected using individual semi-structured interviews with twelve students and nine teachers from six different schools. Data analysis showed gains in students' understanding as well as significant changes towards more pro-environmental values, attitudes and behaviour. Interviews confirmed the quantitative results and verified students' behaviour.

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Introduction

The concept of sustainability has arisen during the past two decades and has gained increasing importance (Zandvliet & Fisher, 2007). The approach endeavours to engage people in critical reflection of current lifestyles and behaviour and enable them to make informed decisions and changes towards a more sustainable world (Fien & Tilbury, 2002). The development of children's environmental knowledge and ecological understandings (Jucker, 2002) and environmental attitudes and behaviours are essential as these youngsters will be responsible for the conservation of the natural environment in the future (Petegem & Blicck, 2006). Within this framework, many proponents of environmental sustainability consider the development of positive attitudes towards the environment to be of particular importance (Gayford, 2009). While acknowledging that there are many variables that influence behaviour, many researchers believe that one of the most

important determinants is attitude (e.g., Bogner, 1998; Boeve-de Pauw & Van Petegem, 2011a; Bogner, Dunlap, Johnson, Manoli, & Wiseman, 2009; Bogner & Wiseman, 2004, 2006; Eagles & Demare, 1999; Heimlich & Ardoin, 2008; Johnson & Manoli, 2010; Kraus, 1995; Milfont & Duckitt, 2004; Newhouse, 1990; Stern, 2000). Other researchers have not found a strong relationship between attitudes and behaviour (e.g., Ajzen, 1987; Cleveland, Kalamas, & Laroche, 2012; Guagnano, Stern, & Dietz, 1995). In at least some cases, however, the lack of relationship may be due to methodological issues such as the lack of clear theoretical framework for attitudes and poor psychometric properties of instruments used (Johnson & Manoli, 2010). In the present study, we included environmental attitudes as an important goal of the Earthkeepers program, while also evaluating the impact of the program on ecological understandings and self-reported behaviour.

Environmental learning in Europe was established by the guidelines of the declarations of the basic environmental education conferences (e.g. Stockholm, 1972; Belgrade, 1975; Tbilisi, 1977; Moscow, 1987; Thessaloniki, 1997), the declarations of the Ministers of Education of the European Community (e.g., UNECE, 2003) as well as other relevant strategies such as the Strategy for Education and Sustainability in Europe: 2005–2015 (United Nations, 2005). In Cyprus, environmental learning has been

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promoted through European Union standards (Cyprus joined EU in 2004) with a number of environmental education programs – such as the “Golden-green Leave”, “GLOBE”, “Young reporters for the environment” and “The seed of life” (Cyprus Ministry of Education and Culture, 2010) – that have found their way to classrooms. In addition, the concept of “ECO-Schools” has become the goal for many of the primary and secondary schools in Cyprus. Eco-Schools is an international program of the Foundation for Environmental Education. Its goal is to raise students’ awareness of sustainable development issues through classroom study as well as school and community action. With the emphasis placed on a democratic and participatory approach, the program encourages children and youth to take an active role in how their school can be run for the benefit of the environment, highlighting the importance of social values (Eco-Schools, 2013). Today, nearly 90% of the schools on the island have embraced this philosophy.

The effectiveness of Eco-Schools in Cyprus has not been evaluated yet, however, there is evidence of their impact in other countries. Boeve-de Pauw and Van Petegem (2011b) found that Flemish Eco-Schools mainly influenced students’ environmental knowledge and, to some extent, their environmental attitudes. Eco-School students had equal preservation attitudes but lower utilization attitudes when compared with control-school students. Furthermore, Krnel and Naglič (2009) found that the Eco-school, as a life project, raises only the level of knowledge but fails to produce the desired results in terms of raising awareness and environmentally responsible behaviour. Similar results were found in a comparative study of 13 countries (Mogensen & Mayer, 2005).

Of great importance are environmental centres which provide opportunities for free-choice learning beyond and outside of the formal education system and can contribute to the education for sustainability (Ballantyne & Packer, 2005). Subsequently, the foundation of several environmental centres around the island has strengthened environmental learning in Cyprus from multiple perspectives. Most environmental centres offer day-long thematic programs and in some occasions multiple-day residential programs. Today, there are several governmental and non-governmental environmental education centres in Cyprus.

During the last decade, the Cyprus Ministry of Education and Culture completed a Strategic Action Plan for Environmental Education (2007) and almost all environmental learning decisions taken are coordinated centrally within the Ministry. In the framework of the recent educational reform, new curriculum was developed regarding environmental learning. The new curriculum introduced Environmental Education and Education for Sustainable Development as a new school subject in all grades of primary education, while in secondary education it is infused through other subjects. Even though it is based on several thematic units (e.g. water, air, soil, energy, biodiversity, sustainable consumption etc.), there are no actual proposed lessons. While teacher and student objectives, suggested learning and teaching approaches as well as evaluation methods are explicitly described, each teacher develops the material that fits to his/her student needs, abilities and the context of the school. This makes the subject more challenging for teachers, and the Cyprus Ministry of Education and Culture and the Cyprus Pedagogical Institute offer professional development seminars to enrich teachers’ pedagogical content knowledge.

The central principle of the new curriculum is to empower students to become environmentally literate citizens and therefore equip them with necessary knowledge (concepts), skills, awareness, attitudes and values. This is the most comprehensive effort the Cyprus Government has made to introduce sustainable development into the educational system, focusing especially on the transformation of schools into “sustainable schools” (Cyprus Ministry of Education and Culture, 2010).

The new curriculum focuses primarily on experiential approaches and less on knowledge-centre ones (Cyprus Ministry of Education and Culture, 2010). The class work includes current, local environmental issues, as well as global ones, and the learning process consists of action and problem-solving activities. Field work and outdoor activities in the schoolyard, nearby areas or environmental centres are also recommended. The philosophy of the new curriculum is based on interdisciplinary principles (combining natural and social sciences), a holistic and systemic approach (considering the complexity of environmental problems), activities (finding and defending different ideas, taking into account the needs of future generations), connecting real local environmental problems and global environmental issues (developing a sense of priority: local–national–global environmental problems), and playing an active role in democratic decision-making on environmental issues by combining cognitive, emotional and aesthetic aspects.

Studies evaluating the impact of environmental learning programs in Cyprus are very limited and fragmented offering very little to the body of environmental literature. Thus, there is an urgent need for more methodologically sound studies assessing the impact of educational programs on students’ conceptual understanding, attitudes and behaviour. A study by Zachariou and Katzie-Beltran (2002) concluded that the programs taught at Lemithou Environmental Centre, the very first environmental centre in Cyprus, contributed to the improvement of students’ conceptual understanding, but they did not succeed in promoting positive environmental attitudes towards the environment. That is not surprising given that the programs focused primarily on knowledge. Another study by Zachariou, Valanides, Kadji-Beltran, and Hrodotou (2003), reported that the participation of 5th graders in an environmental program in Cyprus promoted the development of environmentally responsible citizenship. There is a need for more studies of programs in Cyprus, particularly programs that are more comprehensive and adopt more holistic approaches targeting not only conceptual understanding but also positive attitudes and behaviours towards the environment.

Purpose of the study

The present study investigates the impact of an earth education program, Earthkeepers, on students’ ecological understandings, environmental values and attitudes, and behaviour based on the recent educational reform in Cyprus and the new curriculum in environmental learning. Earthkeepers was purposely selected for the reform effort because it addresses the needs of the new environmental curriculum and targets all three components of understandings, values and attitudes, and behaviours. While the Earthkeepers program has been translated and implemented into several other languages besides English (Finnish, Czech, Dutch, Chinese, Spanish, Japanese, German, Italian, etc.) with great success, it had never before been translated and taught in Greek. The Earthkeepers program, along with all the measurement instruments, were translated and piloted in Greek before the study by the Cyprus Centre for Environmental Research and Education (CY.C.E.R.E.) pedagogical team. The present study evaluates the effects of the Earthkeepers program on 4th to 7th grade students’ (a) ecological understanding of energy flow, cycling of materials, interrelationships and change; (b) environmental values and attitudes; and (c) personal environmental behaviour as a result of students’ experience of an earth education program. The purpose is to (1) inform those who offer the Earthkeepers program in Cyprus, and in other places around the world, about the impacts of the program and (2) contribute to the research literature on ecological understanding, environmental values and attitudes, and environmental behaviour.

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