

The Gambian and Kenyan pupils' conceptions of their valued landscapes and animals

EIJA YLI-PANULA¹, EILA JERONEN², SALLA EILOLA³ AND HEINI-MARJA PAKULA¹

eija.yli-panula@utu.fi

University of Turku¹, Department of Teacher Education, Finland

University of Oulu², Faculty of Education, Finland

University of Turku³, Department of Geography and Geology, Finland

Abstract

Environmental education (EE) is included in the school curricula of The Gambia and Kenya. The background of the study lies on conceptions of the landscape and environmental education from the perspective of sustainable development. The aim of this qualitative study was to find out what kind of landscapes and animals 9–14-year-old pupils from The Gambia (N = 126) and Kenya (N = 150) find worthy of conservation. The participants drew a picture of a landscape they wanted to conserve. Inductive and abductive content analyses were used to analyse the drawings. The pupils drew three types of landscapes. Over half of the pupils described built, one third social and only every tenth pupil nature landscapes. The pupils valued mostly domestic or wild animals (especially Kenyan pupils), only a few pets were drawn. The drawings show that the pupils' conceptions of landscapes were mostly related to their social environment, but nature was also worth to conserve.

Keywords

conceptions, landscape worth conserving, sustainable development, values

Gambialaisten ja kenialaisten oppilaiden käsityksiä arvokkaista maisemista ja eläimistä

Tiivistelmä

Ympäristökasvatus sisältyy Gambian ja Kenian koulujen opetussuunnitelmiin. Tutkimuskehityksenä ovat oppilaiden maisemakäsitykset ja ympäristökasvatus kestävän kehityksen näkökulmasta. Tämän laadullisen tutkimuksen tavoitteena oli selvittää, millaisia maisemia ja eläimiä 9–14-vuotiaat oppilaat Gambiasta (N = 126) ja Keniasta (N = 150) pitävät säilyttämisen arvoisina. Oppilaiden piirroksat analysoitiin induktiivisella ja abduktiivisella sisällönanalyysillä. Piirroksat esittivät kolmenlaisia maisemia. Yli puolet oppilaista piirsi rakennetun, kolmasosa sosiaalisen ja vain joka kymmenes oppilas luontomaiseman. Oppilaiden arvostamat eläimet olivat enimmäkseen kotieläimiä tai villieläimiä (erityisesti kenialaisilla). Vain joissakin piirroksissa oli lemmikkieläimiä. Oppilaiden ympäristökäsitykset liittyivät enimmäkseen heidän sosiaaliseen ympäristöönsä, mutta luontoa pidettiin myös säilyttämisen arvoisena.

Avainsanat

käsitykset, säilyttämisen arvoinen maisema, kestävä kehitys, arvot

Introduction

The knowledge of pupils' subjective world views (Sayer 2011), their environmental conceptions, and relationship to the environment is important to take into account when developing sustainable development education in schools. An ongoing debate has been how the role of education should be conceptualized when creating sustainability and a sustainable future. Sustainability and a sustainable future are here understood as the goals of sustainable development. The present study sets out to explore and analyse Gambian and Kenyan pupils' conceptions and environmental values of landscapes that they deem worth conserving. As far as we know no such studies on pupils' conceptions and values attached to landscapes have been conducted from African cultures until now.

The background of this study lies in Environmental Psychology and in Human Geography, the geographical concept of landscape, and sustainable environment and its values. Landscapes are an integral part of local identities, everyday lives and the wellbeing of people (<https://www.environment.fi/landscapes>). Physical landscapes can be seen as entities of landscapes (Aura, Horelli & Korpela 1997), to which also human beings and human activities belong. So, they are also bearers of historical and cultural values. In this study, the word landscape is used when writing about nature, built and social landscapes; otherwise the word environment is used.

The Gambia and Kenya share a similar history as colony countries of the United Kingdom, and due to this the teaching is carried out in English instead of several national (tribe) languages. Both in The Gambia and Kenya, environmental education (EE) is integrated into the primary and secondary school curriculums (Blanchard 2003; Republic of Kenya 2007). The information taught to pupils is broad, covering a variety of environmental topics and terms.

The focus in the Gambia is on practical topics such as deforestation, erosion, and desertification. EE starts in the first year of school and continues through all levels of formal schooling (Blanchard 2003). The subject matter comes from The Gambia Environmental Action Plan (GEAP) created by The National Environmental Agency (NEA) (The Environment Unit of the Ministry...1992). The goal is environmental awareness on the national and international level. GEAP covers the topics of the physical environment, environmental health, the urban and coastal environment, physical planning, energy, and important current issues. This content is incorporated into existing curricular areas such as social and environmental studies, health education and biology. (Blanchard 2003)

In Kenya, EE is integrated and infused in an interdisciplinary way across Kenya's education systems (Mutisya & Barker 2011). Infusion is defined by Ramsey, Hungerford and Volk (1992) as the integration of content and skills in into existing courses. In primary schools, EE is infused into science and social studies, and environmental values are also integrated in English, mathematics and creative art (Mutisya & Barker 2011). Kenya Institute of Education (2002) states that the objectives of EE in Kenya's primary schools are to develop positive attitudes about the environment, to manage and conserve available resources, and to develop awareness and appreciation of the environment. The focus lies on the main environmental challenges facing Kenya today such as climate change, global warming, pollution, deforestation, poor garbage disposal, soil erosion, inadequate rainfall etc. (Karanja 2010). By exploring pupils' conceptions of conserving landscapes and animals, practical information can be found to develop curricula and teaching of EE in both countries.

Theoretical background

Conceptions of the environment

Understanding one's own environment and its functioning (OECD 2005) is important for individuals' awareness of their identity. In addition it is important to support the development of their ability, motivation and desire to play an active role in finding democratic solutions to problems and issues connected to sustainable development (Mogensen & Schnack 2010).

The present study focuses on conceptions of sustainable development and their relation to human and physical effects on the landscape and the environment. Earlier research has shown that environments may be seen as objects with instrumental value to cater for human interests or as environments with intrinsic value to be taken care of (Shepardson, Wee, Priddy and Harbor 2007). Loughland, Reid and Petocz (2002), looking at children's relations to the environment, found that some children viewed the environment as an object of action – looking at the environment “out there”, whereas others saw it in relation to themselves – including themselves in the environment.

The conceptions in relation to sustainable development and their relationships between human and physical effects on the landscape/environment are in focus in this study. The proportion of students holding ‘relation to nature’ conceptions seems to drop when students pass from primary to secondary school (Loughland, Reid, Walker & Petocz 2003). Past experiences and perceptions of one's own actions or the environment are significant to how one sees the future (Neisser

1982, 49–50). Hence keeping teens from participating in nature, and excluding them from discussions and decisions around the natural landscape, including social, political, and ecological aspects, may lead to a decline in their concern for conservation efforts in the future (Brunelle, Brussoni, Herrington, Matsuba, & Pratt 2018).

Knowledge of environmental issues seems to be independent of the conception of environment in secondary school and is negatively correlated with 'relation' conceptions in primary school. According to Petocz, Reid and Loughland (2003), adults' conceptions of environment are fundamentally the same as those of the students. They also argued that while people may develop the sophistication of their ideas about the environment as they progress through school and pass into adulthood, they do not easily change their essential conceptions of the phenomenon.

Jeronen, Kaikkonen and Lind (2008) studied students', teachers', and parents' conceptions of environment in Northern Finland. Both the students and adults valued an unpolluted environment and clean and pleasant nature, supporting the findings of Jeronen and Kaikkonen (2002). Students' conceptions of the environment changed with increasing age. The younger students discussed safety issues and versatile activities while the older ones and adults especially valued services. The parents were more worried about insecurity, violence, vandalism, restlessness, noise problems, and alcoholism than the other groups. The adults discussed the concept of the environment more holistically and paid attention to physical, mental and social dimensions.

Conceptions of landscapes

Landscapes are manifestations of biophysical, cultural, and economic processes, facing constant changes. Changes reflect the different ways people interact with their environment. The meanings and values ascribed to landscapes are driven by their aesthetic appeal (Gobster, Nassauer, Daniel & Fry 2007), the recreation and leisure activities they support (Komossa, van der Zanden, Schulp & Verburg 2018), their social and cultural significance (Brown & Christopher 2007), and their ability to improve individuals' mental health and well-being (Plieninger, Dijks, Oteros-rozas & Bieling 2013).

The value of complex landscapes and wild lands for children, and how children perceive and experience wild lands as places of their own domain have been described e.g. by Titman (1994) and Rivkin (1990). Children appreciate colors in nature, trees, woodlands, shifting topography, shaded areas, meadows, places for

climbing and construction, and challenging places for exploring and experience (Titman 1994). According to Rivkin (1990), children emphasize the “realness”, symbolism and images that can make a landscape magical.

Yli-Panula and Eloranta (2011) showed that the preference for a certain type of a landscape is not in linear relation with the age of the pupil; on the contrary, all types of landscapes were drawn in every age group in their study. In addition, Kaivola and Rikkinen (2003) found that the landscapes in the drawings by Finnish pupils in Basic Education to be strongly connected to nature. Nature landscapes mostly involved forest and water landscapes and only a few animals (Yli-Panula & Eloranta 2011). The Finnish children and adolescents valued the ecological features of the forest, as well as outdoor activities in forests, while the young Russians appraised the healthy and clean air and aesthetic values of the forests (Eloranta 2008). A finding made by Loughland et al. (2002), Cantell, Rikkinen and Tani (2007) and Yli-Panula and Eloranta (2011) was that the nature and cultural landscapes are gradually dissolved into each other. The drawings of social landscapes indicated a close relationship between man and the environment (Béneker, Sanders, Tani & Taylor 2010; Yli-Panula & Eloranta 2011).

According to Yli-Panula and Eloranta (2011), the youngest pupils favoured water and cultural landscapes more than the teenagers. The cultural landscapes of everyday life were emphasized and, in the landscapes, man-made things and man itself were involved. The girls and boys observed the surroundings in different ways. The girls preferred pure nature and water landscapes without human beings more often than the boys. The pupils experienced their landscape as a viewer (looking at it) or as active participants (having active roles in the landscape) and as human beings living with it (taking responsibility for it). (Yli-Panula & Eloranta 2011)

Studies (Gearin & Kahle 2006; Driskell, Fox & Kudva 2008) on teenagers' relationship to space, landscape, and the natural landscape show adolescents' need to be able to modify places to be accessible to youth and be flexible enough for multiple, unstructured uses. They desire to belong to a welcoming community, and complain about the paucity of spaces meeting such needs. From the educational perspective, the teaching of these issues involves making the pupils aware of the fact that they are the adult generation of the future, and that they are therefore part of a democratic process that secures a sustainable development for the future landscape. This can also be called environmental education or education for sustainable development (cf. Clausen 2016; Huckle 2014).

Sustainable development and environmental education

The concept of sustainable development derives from the concept of Triple bottom line, which refers to the balance between three dimensions of sustainability: environmental or ecological sustainability, social sustainability, and economic sustainability (Elkington 1994). The social dimension is often split into social and cultural dimensions. The goal of the environmental dimension is conservation of all living things, resources and life-supporting systems. The social dimension involves people living together with the goals of peace, equality and human rights (Fien, Maclean & Park 2009), and preservation of cultural identity, respect for cultural diversity, race and religion. The economic dimension comprises jobs and income. (Klarin 2018)

Perceptions of the landscape are reflected in attitudes and in individual or collective behaviours. Among others, Smith and Mackie (2007) consider attitudes as learned and changeable. It has been considered that EE, education for sustainable development (EfSD or ESD), sustainable development education (SDE), sustainability education, and sustainable education (SE) are ways to make people understand the complexity of the landscape and to adapt their activities in ways which are harmonious with the landscape. All these forms of education share a vision of quality education and a society that lives in balance with Earth's carrying capacity integrating all dimensions of sustainable development. In this study, we use the term EE because it is used both in the Gambian and Kenyan curricula.

EE should foster continuously people's environmental sensitivity and awareness (UN 1992), encourage individuals and communities to acquire information of the environment (UNESCO-UNEP 1978) and to develop their skills and competencies for the understanding and resolving environmental problems (Jeronen, Jeronen & Raustia 2009). EE is inherently interdisciplinary examining the ecological, social, cultural and other aspects of environmental problems. With the adoption of the problem- and action-oriented approach, EE becomes both lifelong and forward-looking.

Environmental values as part of the environmental education

There is a growing realization that environmental problems cannot be understood without reference to social, political and economic values. According to Yencken, Fien and Sykes (2000, 40) "Values are normative views about the world. They are concerned with the way the world ought to be not just with the way the world is."

Environmental values can take many forms (see Tadaki et al. 2017). They can be understood as human values or individual's personal priorities (Hicks et al. 2015), ecological and social perspectives (Boon & Freeman 2009; Bryan et al. 2010) but also as the socio-cultural meanings to ecosystems (Gould et al. 2015).

According to Fien and Tilbury (1996), the most important environmental values and attitudes are: 1) ability to distinguish between statements of facts and values; 2) awareness of the existence of different value perspectives; 3) respect for different ways of life and environmental beliefs and values; 4) ability to identify, clarify and justify people's own value positions; 5) a personal environmental ethic, based on a sensitivity to and willingness to care for the natural and social environment, and 6) sense of responsibility for the consequences of people's own choices and actions on the environment.

Values host attitudinal aspects such as beliefs, emotions and various behaviours (Kollmuss & Agyeman 2002). Whitley, Takahashi, Zwickle, Besley and Lertpratchya (2016) found that support for recycling, reduced electricity use, food selection and transportation choices varied due to value orientations. The students with biospheric and altruistic values participated or engaged more in a range of described behaviours compared to the students with egoistic values. Individual values seem to be slow to change (Rokeach 1973). Changes in the life path can, however, affect or generate a rapid shift in values. The more significant the change in life is, the more values change (Bardi, Lee, Hofmann-Towfigh & Soutar 2009).

The Aim of the Study and Research Questions

Currently, it is widely accepted that sustainable development is crucial for the construction of a sustainable society, and that EE is a means to individual and social change. For developing curricula and instruction in basic and teacher education, it is important to know what conceptions pupils have about the environmental issues regarding sustainable development. The aim of this descriptive study is to analyse the drawings of Gambian and Kenyan pupils to find out what kind of landscapes and animals they appreciate and consider worthy of conservation. The following research questions guided the study:

1. What are the valued landscapes, worthy of conservation, presented in the drawings by the Gambian and Kenyan pupils?
2. What do the drawings reveal about the animals that the pupils value?
3. What kind of conceptions do the pupils have about their own landscape?
5. An additional objective of the study is to discuss the pupils' conceptions of their own landscape from the point of view of EE.

Material and methods

Study design

The data includes drawings by Gambian and Kenyan pupils in 2010. The drawings were collected from two rural and city schools in both countries from a total of 276 pupils. The Gambian pupils were from grades 2–7, aged 9–13 years and the Kenyan pupils from grades 2–7, aged 9–14 years. One school grade is equivalent to a certain age group (apart from a few exceptions) in both countries. Ten drawings were excluded, four due to missing information and six atomistic ones. The final number of participants was 256 pupils, of which 116 were from The Gambia (boys 45,7 %, girls 50,0 % and unknown gender 4,3 %) and 150 from Kenya (boys 59,3 %, girls 40,7 %).

The pupils were asked to draw a landscape you would like to conserve followed by an explanation that the concept of landscape is connected to the environment. Every pupil used an A4 paper sheet and crayons, and wrote her/his name, age, gender and grade on the back of the sheet. The pupils were also asked to write what their drawings present, but only a few did it.

Analyses concerning the three main landscapes and their subcategories

To identify the landscapes valued by the pupils (Aura, Horelli & Korpela 1997; Yli-Panula & Eloranta 2011), inductive and abductive content analyses (Ahonen 1994; Loughland et al. 2002; Eloranta 2004) were used. The valued elements in the drawn landscapes were analysed into landscape types – nature, built and social (with the human present) - and further categorised into seven landscape subcategories based on the most prominent features of the drawings (Table 1). The analysis was done by two researchers. The six drawings of five Gambian girls and one Gambian boy depicting separate, unconnected objects were defined as atomistic and were excluded from the analysis.

Table 1. The identified subcategories of the landscapes drawn by the Gambian and Kenyan pupils

Subcategory	The items in the drawings
Village	Several houses, roads or paths, social and livelihood activities, e.g., livestock keeping
Yard	One or few houses surrounded by trees, cropland and other social or livelihood activities, sometimes with a fence
City or town	High building or buildings, broad streets or roads, cars
Agricultural	Fields and paddocks, livestock, fruit trees and usage of forest resources, water elements and fishing activities
Natural forested	Trees, grasslands, hills, rivers and lakes, wild animals
Mountainous	A mountain dominates the landscape
Water	Water dominates the landscape

Analyses concerning conceptions of landscapes

The categories by Loughland et al. (2002) were modified (see Yli-Panula, Persson, Jeronen, Eloranta & Pakula 2019) and used to analyse the Gambian and Kenyan pupils' conceptions and values of the landscapes (Table 2) based on their drawings. When the landscape was seen as an object, the drawings were classified as categories 1–3. The drawings in which the landscape was seen as a place containing only some objects were classified as category 1. Category 2 included the drawings containing living organisms, animals or vegetation, while the drawings containing also people were classified as category 3. The original categories C5–C6 of Loughland et al. (2002) were combined to form category C5. Categories 4–5 differed qualitatively from categories 1–3. The drawings where the landscape was described as a relationship between man and nature were classified as these categories. In the drawings of category 4 nature was seen to be for people, but there was no indication of taking care of it. Category 5 included the drawings where the landscape was seen as a place full of life – people and society were described as a part of it and responsible for it living in harmony with the nature in a sustainable relationship with the landscape.

Table 2. Five landscape conception categories (C1–C5) based on the categories (C1–C6) of Loughland and others (2002), modified to be suitable for analysing the drawings (Yli-Panula et al. 2019). The original categories C5–C6 have been combined to form C5. In C1–C3 the landscape is just an object and in C5–C6 the drawer has a relationship to the landscape.

	The environment is	Typical for drawings
Object focus	C 1 a place	a scanty, lifeless landscape
	C 2 a place with abiotic and biotic (living organisms) matters	a traditional/schematic nature landscape with forest, meadow or mountain, man not present
	C 3 a place with abiotic and biotic matters and man present	man present, drawn from a distance e.g. man drawn as a sole object, in a very schematic nature or cultural landscape
Relational focus	C 4 a place for activities, means something for human beings also in the aesthetic manner	pupils' own room/home drawn from inside or outside, courtyard, hobbies/family activities, pets, no environment caring activities by man
	C 5 a place people and the society are part of and responsible for	environment produced and kept by society, principal icons or symbols like church, school building; cultural things like play instruments; farm environment, domestic animals, fishing; statement of retaining the place/ landscape/ environment, concern on climate change, cleaning up the environment

The animals drawn by the pupils were also analysed. For this purpose the animals were grouped into domestic animals (e.g. cow, chicken, goat), pets (e.g. cat, dogs) and wild animals (e.g. crocodile, giraffe). The prevalence of these three animal groups in the drawings was analysed.

Trustworthiness of the process

In order to ensure the trustworthiness of the process, a common feature of the criteria for qualitative content analysis is that the criteria aspire to support the trustworthiness by reporting the process (Elo et al. 2014). For establishing credibility, we have described the respondents of the study accurately. To ensure

dependability the process is described thoroughly. To ensure conformability two of the researchers categorized and carried out the analyses independently. The formation of the categories was done through discussions between the two researchers after initial analysis of all the drawings and final decisions were made when consensus was reached and clear arguments were found as to which features in the drawings constitute each category. As such decisions always include elements of subjective interpretation, and joint discussions about the drawings were therefore essential. To ensure transferability the findings are discussed in the light of previous studies. By describing fairly and faithfully the whole studying process we have ensured its authenticity of it. (Lincoln & Guba 1985)

In addition, researcher triangulation was an essential part of the process (Elo et al. 2014). Our research group consisted of experts from biology and geography education, environmental education, sustainable development education, educational sciences, and language education and three of the authors are experienced teacher educators and researchers.

Results

Landscapes worthy of conservation

On the basis of the analysed drawings, out of the total of the Gambian and Kenyan pupils (N = 266), 58,6 % wanted to conserve the built landscape, 30,1 % the social landscape and the least drawn was the nature landscape.

The majority of the Gambian pupils (63 %) drew a built landscape (Fig. 1). There were houses (or a house) and a yard surrounded by trees or a village with its neighbourhood, sometimes also high buildings and streets like in a town. Music instruments could be drawn in the yard or a mosque in the village. The second most common (36 %) was the social environment. People were often presented in a yard or a village doing something like shepherding the cows, carrying water, playing etc. Only 1 % of the pupils drew nature landscapes. The only authentic nature landscape drawn by a Gambian pupil described a hill with coconut palms and grass land.

The built landscape was also most valued (56%) by the Kenyan pupils. Like in the Gambian data, the built landscapes presented houses or huts, a yard or a village. Roads or paths and cars were depicted, too. Social landscapes were the second most valued (25 %). Human beings were described on yards, in villages or in their surroundings doing their daily tasks like shepherding domestic animals,

chopping firewood or fishing. Nature landscapes were more often drawn by the Kenyans (19%) than the Gambians (1%). In the nature landscapes, there were mountains, forests, wild animals, ponds and rivers. Domestic animals appeared in nature landscapes without man's presence. Nature landscapes presenting acid rains and their devastating effects on the vegetation were drawn by a few girls. These landscapes were regarded as nature landscapes since man or any buildings were not drawn.

Valued landscapes in the Gambian and Kenyan pupils' drawings

Almost all identified landscape subcategories were depicted in drawings from both countries. The most often drawn landscapes represented yards (84 % of the Gambian and 53 % of the Kenyan drawings), villages (19 % of the Kenyan and 7 % of the Gambian drawings) or agricultural landscapes (10 % of the Kenyan and 1 % of the Gambian drawings). Natural forested landscapes were depicted in Kenyan drawings (11 %) but were non-existent in the Gambian data. The Gambian pupils drew city and town environments more often (6 %) than the Kenyans (1 %). Water and mountainous landscapes were seldom drawn in both countries (Figure 1).

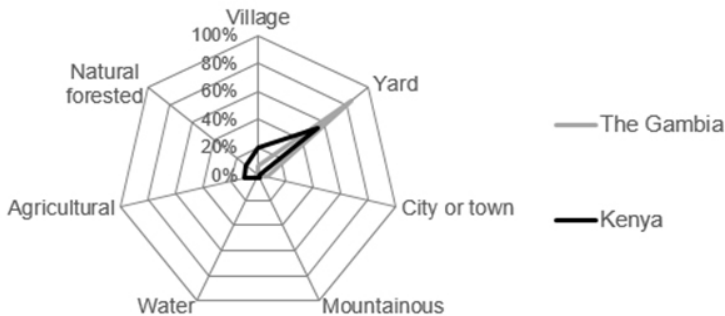


Figure 1. The percentage distribution of the subcategories of the valued landscapes by the Gambian and Kenyan pupils

There were only a few people in the drawings, but their influence on the landscapes was often shown (Figure 2). In most drawings, the use of the environment or benefit to humans and their livelihoods was clearly presented. In the yard landscape, farming and other everyday activities such as fetching water, tending animals and playing were described. In the Gambian drawings, the yard was sometimes fenced. School buildings were drawn in the yard landscapes in both countries. In the village and agricultural environments, livelihood

activities such as farming livestock, cultivation, fishing and firewood collection were described. The city or town drawings included building(s) and roads with cars, however, humans and urban bustle were not depicted. In mountainous landscapes, the mountain dominated the drawing and it was presented either in natural surrounding or in human influenced landscape. In several Kenyan drawings, mountains or volcano craters were drawn but they were only one of the many landscape features in natural or human environments. Water dominated landscapes presented a lake, sea or river surrounding trees and other vegetation and including humans or human activities such as fishing, sailing, swimming and enjoying the beach.

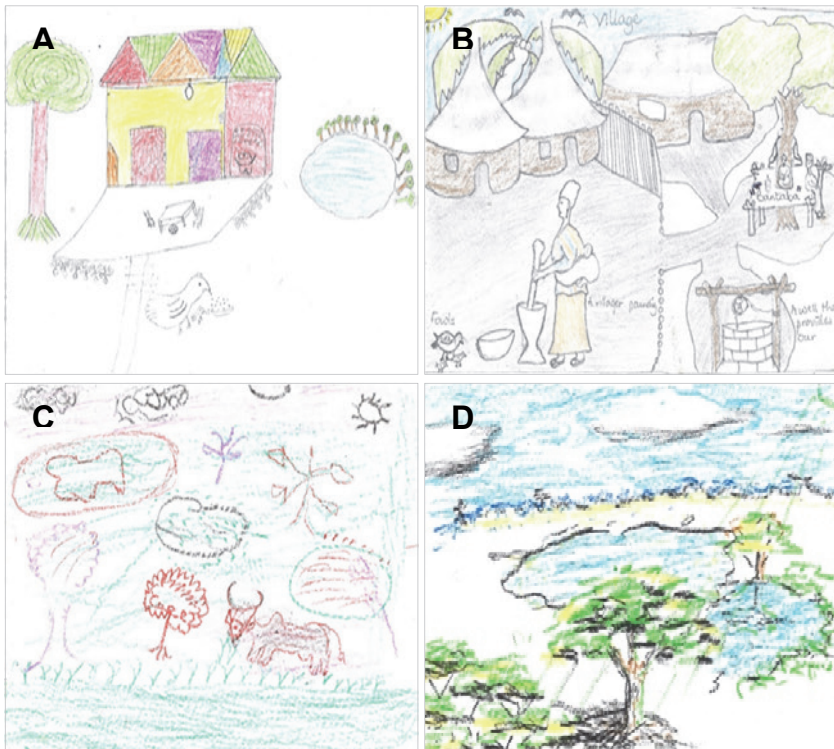


Figure 2. Example drawings of four most common landscape subcategories in the Gambian and Kenyan pupils' drawings. A from the Gambia depicts a yard of a house with garden and chickens, B from the Gambia a village with houses and people in their daily activities, C from Kenya agricultural landscape with trees and a cow in the fields, and D from Kenya a natural forested landscape with trees and a lake.

Only some Gambian pupils described their drawings in writing commenting that they liked village or city life. The Kenyan drawings were accompanied more often by written descriptions, but they were few in number. Many pupils described home and its surroundings with things that benefit humans and animals, such as rain to humans, farm animals and other living beings. These benefits are exemplified in these three descriptions of the Kenyan pupils below:

“Landscape is important because of many of forest and the forest you get timber from the forest and the many rivers they come from the forest many attributes come from the forest our environment is important cows they get grass in our forest.” (boy, 10 years, grade 10, 55A)

“I have very good landscape there are animal and forest beautiful flowers lake water have drink grass graze animal tree rain mango give fruit cow give milk and meat.” (boy, 12 years, grade 6, 60A)

“I have draw this picture that the water is very useful in human life even animals and plant. Because then the rain fall down our domestic animals can become fat like a pig and we sold it at higher amount of money and at the same time the plant in our shamba [farm] can grow well in this such conditions and our yield is very high. So this is my facts about this pitcher.” (boy, 14 years, grade 6, 99A)

Valued animals in the valued landscapes

Animals were drawn in the valued landscapes of the pupils in both countries (Figure 3). Kenyan pupils drew animals in 79 % and Gambian pupils in 40 % of their drawings. Valued animals were mostly domestic (80 % of the Gambian % and 50 % of the Kenyan drawings with animals), wild (48 % of the Kenyan; 17 % of the Gambian) or pets (2 % of drawings with animals in both countries). There were animals of many different categories drawn in the same picture. Of the domestic animals, cows were the most common followed by chickens. The most common wild animals were crocodiles and flying birds, and giraffes, snakes and fish were also drawn as well as pets, such as cats, dogs and rabbits. Apart from cows and crocodiles, which were drawn in the same location, animals were mainly described in their natural habitat.

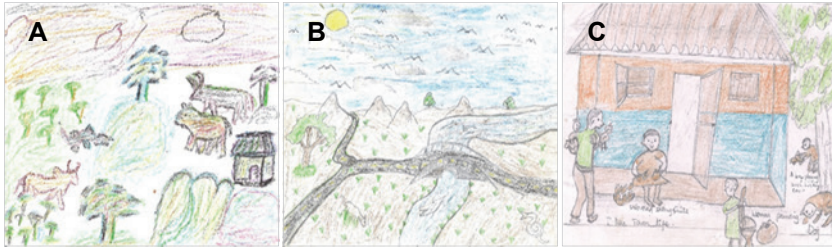


Figure 3. Example of drawings depicting the three animal types identified in the Gambian and Kenyan pupils' drawings. A one from Kenya depicts domestic animals (cows in the field), B from Kenya wild animals (crocodiles in savannah) and C from the Gambia pets (a dog in the yard).

Pupils' conceptions concerning of their own landscapes

In both countries, pupils valued the built environment, and the importance of the society was obvious in the drawings. Human beings or benefits of the landscape to human beings were commonly described. The pupils in both countries saw the connection between nature and human beings (Table 3, categories C4 and C5). This connection was also shown by the common descriptions of domestic animals and agricultural features in the landscapes. Only a few drawings belonged to categories 1–3. Pictures of nature as an object, detached from humans or human influence, were clearly a minority (15 Kenyan drawings and one Gambian drawing). It was difficult to interpret the category of caring for the landscape because it could not be identified directly from the drawings and very few pupils explained their drawings in writing.

Table 3. Conceptions of the landscapes were analysed according to Loughland et al. (2002) modified categories

	The conception categories				
	C 1	C 2	C 3	C 4	C 5
The Gambia N = 116 (100%)	0	1 (1%)	0	48 (41,3%)	67 (57,7%)
Kenya N = 150 (100%)	0	15 (10%)	0	31 (20,7%)	104 (69,3%)
All N = 266 (100%)	0	16 (6,0%)	0	79 (64,3%)	171 (64,3%)

The most valued landscapes in the Kenyan pupils' drawings were villages and agricultural landscapes while the Gambian pupils mostly drew yard landscapes. There were clear differences between the prevalence of some of the Gambian and

Kenyan pupils' favourite landscapes, for instance, a yard was presented in 73% of the Gambian and 21% of Kenyan drawings, a village in 32% of Kenyan and 16% of the Gambian drawings and agricultural landscapes in 29% of Kenyan and 1% of the Gambian drawings.

Discussion

The present study set out to find out what kind of landscapes and animals 9–14-year-old pupils from The Gambia (N = 126) and Kenya (N = 150) find worthy for conservation. The built environment was the most valued both by the Gambian and Kenyan pupils and the least valued was the nature landscape. The Kenyan pupils drew more nature landscapes than the Gambian pupils. Domestic animals were more valued than pets, which were the least valued in both countries. The most valued landscapes in the Kenyan pupils' drawings were villages and agricultural landscapes while the Gambian pupils drew mostly yard landscapes. The pupils in both countries saw the connection between nature and human beings but most of them understood the landscape to be an object for human activity.

The results showed that all types of the classical conception of the landscape (nature, built and social) were represented in the data. The finding is in line with the previous studies on landscape drawings by Russian and Finnish 7–16-year-olds (Yli-Panula & Eloranta 2011; Yli-Panula et al. 2019) and Nepalese and Swedish 7–8-year-old children (Yli-Panula et al. 2010). Primary school pupils in The Gambia and Kenya favoured built and social landscapes. It seems that pupils in both countries appreciate the community as well as safe places (cf. Jeronen & Kaikkonen 2002). Thus, cultural and social sustainability are visible in the drawn landscapes. In contrast to the drawings made in Western countries (Finland and Sweden, in Yli-Panula et al. 2012), but correspondingly to the Nepalese drawings (Yli-Panula et al. 2010), there were plenty of social landscapes in the drawings of the Kenyan and Gambian pupils. This similarity can be explained by the cultural, social and experiences of a certain group of people (Brown & Christopher 2007).

Water, mountain, yard and forest landscapes with changing surfaces and colours were found worth conserving (cf. Rivkin 1990; Titman 1994; Yli-Panula & Eloranta 2011). An indication of social sustainability is the appreciation of water in the dry countries of the pupils. The drawings of yards and villages represented social and livelihood activities. The presence of such human activities in the environment is likely to affect preferences and engender appreciation for that environment (Atauri, Bravo & Ruiz 2000).

The Gambian and Kenyan pupils valued domestic, wild animals and pets in their drawn landscapes as did the Finnish and Russian children in Eloranta and Yli-Panula's 2005 study. Their drawings reflect environmental awareness describing the habitats of wild animals and the effect of pollution on nature caused by man. Presenting places of domestic animals and livestock keeping they show the practical focus which is emphasized in the curriculums of both countries (Blanchard 2003; Karanja 2010). The pupils in both countries saw the connection between nature and human beings but, the most of them viewed the landscape as an object for human activities (cf. Loughland et al 2002).

Livestock keeping seemed to be an important source of livelihood and it was described by having the cow as a source of milk or helping with the work in the fields. Especially Kenyan pupils valued wild animals. This can be explained by pupils' natural interest in animals (e.g. Kaivola & Rikkinen 2003; Kellert 1996) and also by educational initiatives, such as the environmental awareness programs in primary schools (Mutisya & Barker 2011). The animals are important for tourism and have other utilitarian values in Kenya and can be considered worth conserving.

The pupils tended to have an understanding of what landscape and the environment mean, but their understanding of the two concepts appeared to be limited. This finding is in line with Loughland and others' (2002) study of Australian pupils. The study provided important information about the types of environments that were valued and about the understanding that the studied pupils had about the landscape and the environment. These findings are to be kept in focus when developing individual and community capacity and when acting adaptively to promote more resilient socio-ecological systems in EE and developing youth-focused citizen science (Ballard, Dixon & Harris 2017).

There are some concerns about the validity of the study. One may be related to the data. The drawing task was not easy for all participants. Some students drew spontaneously on the paper what the concept of landscape brought into their mind, others struggled with the task. An advantage of the drawing task as data is that requires simultaneous cognitive processes such as conjuring an image of a valuable landscape worth conserving and drawing a picture. The cognitive processes are based both on the existing knowledge and on the observations that students make in the environment. Such parallel cognitive processes are challenging and may prove difficult for some students, and they might benefit from other modes of providing data. Another limitation of the study is the lack of opportunity to interview the pupils to get a broader understanding of the pupils' environmental conceptions. Yet another validity concern is the time of

data collection, which took place almost ten years ago. Collecting fresh reference data might produce data about potential shifts in pupils' conceptions and the causes thereof.

Conclusion

Provision of appropriate learning experiences in EE presupposes the development of a policy that is based on pupils' conceptions and understanding of their own landscape. According to Suomela and Tani (2004), teaching sustainable and environmentally conscious living has been undermined by the lack of discussion about the sociocultural environment in EE. The Kenyan and Gambian pupils considered the sociocultural environment important, which according to Suomela and Tani (2004) can potentially help pupils to internalize the learning objectives of EE – namely to understand the importance of environmentally sustainable human behaviour. Furthermore, the Kenyan and Gambian pupils' drawings exhibited the two conceptions of landscape which Suomela and Tani (2004), in addition to the scientific conception, consider a prerequisite for pupils to perceive in order for them to act sustainably. The pupils conceive the valuable landscape as a living environment and as a socially produced or strongly socially influenced environment. However, on the basis of this study it is impossible to say if the pupils' conceptions of the landscape translate into behaviour. There are numerous factors affecting peoples' environmental behaviour, such as access to water and waste management facilities.

The lack of natural landscapes in the Gambian drawings in particular is interesting, as it indicates that the pupils do not have much regard to natural landscapes and their intrinsic value, which are important ideas in nature and biodiversity conservation. The lack may also imply that the pupils have little experience from or exposure to visual representations of untouched nature, which could have allowed them to establish a connection to the natural landscape. This is probably the case with the Gambian pupils, living in a country with few wild animals in the surroundings. Nature is depicted in the drawings as an important provider of livelihoods in these two countries where a large proportion of the population depends on nature for living. Thus, nature has a utilitarian value or at least for an outside observer the value of nature seems to be utilitarian to the pupils in the two countries. For example, many trees depicted in the drawings are the kind which provide fruits, oil, building material, firewood and shade as well as cultural value. Perhaps the cultural valuations of nature also include appreciation of the intrinsic value of nature, which is not possible for an outsider to identify in the drawings but should be studied more in the field of EE.

On the basis of the results, it would appear that pupils' access to the debate and participation in activities in landscape and environmental protection should be increased both in The Gambia and Kenya. Furthermore, the teaching and learning should offer the pupils with more diverse landscape imagery and support the pupils' dawned views about humans as part of and responsible for their own environment. The pupils' home and its surrounding environment are clearly important for them when regarded worth conserving. The desire to conserve surrounding environments could be fostered by teaching and learning about everyday environmentally friendly practices by teaching the pupils to see the wider natural environment as an important part of their own and global well-being. In addition, drawing as self-expression is a possible way for pupils to express their concerns and ideas about environmental protection, for example through an exhibition giving them a sense of agency in their own communities.

It would also be possible for schools to offer experiences which develop pupils' capacities to create an egalitarian and responsible society, which can improve people's quality of life, without deteriorating the environment and planet; and provide all pupils with cross-cutting key competencies to advance sustainable development would be taught to all pupils. These sustainability key competencies are: systems thinking competency, anticipatory competency, normative competency, strategic competency, collaboration competency, critical thinking competency, self-awareness competency and integrated problem-solving competency (de Haan 2010; Rieckmann 2012; UNESCO 2017; Wiek, Withycombe & Redman 2011). They represent what sustainability citizens particularly need to deal with today's complex challenges all over the world. They are relevant to all sustainable development goals and also enable individuals to relate the different sustainable development goals to each other – to see “the big picture” of the 2030 Agenda for Sustainable Development.

References

- Atauri, J.A., Bravo, M.A. & Ruiz, A. (2000). Visitors' Landscape preferences as a tool for management of recreational use in natural areas: a case study in Sierra de Guadarama (Madrid, Spain). *Landscape Research*, 25(1), 49–62.
- Aura, S., Horelli, L. & Korpela, K. (1997). *Ympäristöpsykologian perusteet*. Porvoo: WSOY.
- Ballard, H.L., Dixon, C.G.H., & Harris, E.M. (2017). Youth-focused citizen science: Examining the role of environmental science learning and agency for conservation. *Biological Conservation*, 208, 65–75.

- Bardi, A., Lee, J.A., Hofmann-Towfigh, N., & Soutar, G. (2009). The structure of intraindividual value change. *Journal of Personality and Social Psychology: Personality Processes and Individual Differences*, 97(5), 913–929. doi: 10.1037/a0016617
- Béneker, T., Sanders, R., Tani, S., & Taylor, L. (2010). Picturing the city: young people's representations of urban environments. *Children's Geographies*, 8(2), 123–140.
- Blanchard, T. (2003). *Formal Environmental Education in The Gambia*. Retrieved February 2, 2019, from <http://www.smcm.edu/gambia/wp-content/uploads/sites/31/2015/03/formal-environmental-education.pdf> (accessed on 2 February 2019).
- Boon, P. J. & Freeman, M. (2009). Methods for assessing the conservation value of rivers. In P. J. Boon and C. M. Pringle (Eds.), *Assessing the conservation value of freshwaters: an international perspective* (pp. 142–165). Cambridge UK: Cambridge University Press.
- Brown, G. & Christopher, R. (2007). The Relationship between Place Attachment and Landscape Values: Toward Mapping Place Attachment. *Applied Geography*, 27(2), 89–111.
- Brunelle, S., Brussoni, M., Herrington, S., Matsuba, M. K. & Pratt, M. W. (2018). Teens in Public Spaces and Natural Landscapes, Issues of Access and Design. In J. E. Lansford & P. Banati (Eds.), *Handbook of Adolescent Development Research and Its Impact on Global Policy* (pp. 1–14). University Press Scholarship Online, Oxford Scholarship Online. Retrieved July 24, 2019, from <https://www.oxfordscholarship.com/view/10.1093/oso/9780190847128.001.0001/oso-9780190847128-chapter-18?print>.
- Bryan, B. A., Raymond, C. M., Crossman, N. D. & Macdonald, D. H. (2010). Targeting the management of ecosystem services based on social values: where, what, and how? *Landscape and Urban Planning*, 97, 111–122. <http://dx.doi.org/10.1016/j.landurbplan.2010.05.002>
- Cantell, H., Rikkinen, H. & Tani, S. (2007). *Maailma minussa – minä maailmassa. Maantieteen opettajan käsikirja*. Studia Paedagogica, 33. Helsinki.

- Clausen, S. W. (2016). The pedagogical content knowledge of Danish geography teachers in a changing schooling context. *Nordidactica – Journal of Humanities and Social Science Education*, 1, 1–22. ISSN 2000-9879.
- De Haan, G. (2010). The development of ESD-related competencies in supportive institutional frameworks. *International Review of Education*, 56, 315–328.
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. & Kyngäs, H. (2014). Qualitative Content Analysis: A Focus on Trustworthiness. *SAGE Open* January-March 2014, 1–10. DOI: 10.1177/2158244014522633
- Driskell, D., Fox, C. & Kudva, N. (2008). Growing up in the new New York: Youth space, citizenship, and community change in a hyperglobal city. *Environment and Planning A*, 40(12), 2831–2844. <http://doi.org/10.1068/a40310>
- Elkington, J. (1994). Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development. *California Management review*, 36(2), 90–100. DOI: 10.2307/41165746.
- Eloranta, V. (2008). Kuudesluokkalaisten ajatuksia piirtäen: Millainen on metsä? *Natura*, 4, 24–30.
- Eloranta, V., & Yli-Panula, E. (2005). Animals in the drawings of the landscape by Finnish and Russian young people in the landscape they want to conserve. *NorDiNa*, 2(5), 5–17.
- Fien, J., Maclean, R. & Park, M.-G. (Eds.) (2009). *Work, Learning and Sustainable Development*. Dordrecht: Springer.
- Gearin, E. & Kahle, C. (2006). Teen and adult perceptions of urban green space Los Angeles. *Children, Youth and Environments*, 16(1), 25–48.
- Gobster, P. H., Nassauer, J. I., Daniel, T. C. & Fry, G. (2007). The shared landscape: What does aesthetics have to do with ecology? *Landscape Ecology*, 22(7), 959–972.
- Gould, R. K., Klain, S. C., Ardoin, N. M., Satterfield, T., Woodside, U., Hannahs, N., Daily, G. C. & Chan, K. M. A. (2015). A protocol for eliciting nonmaterial values through a cultural ecosystem services frame. *Conservation Biology*, 29(2), 575–586. <http://dx.doi.org/10.1111/cobi.12407>

- Hicks, C. C., Cinner, J. E., Stoeckl, N. & McClanahan, T. R. (2015). Linking ecosystem services and human-values theory. *Conservation Biology*, 29(5), 1471–1480. <http://dx.doi.org/10.1111/cobi.12550>.
- Huckle, J. (2014). Education for Sustainability: Assessing Pathways to the Future. *Australian Journal of Environmental Education*, 30, 31–50. Doi:10.1017/aee.2014.21.
- Jeronen, E., Jeronen, J. & Raustia, H. (2009). Environmental Education in Finland – A Case Study of Environmental Education in Nature Schools. *International Journal of Environmental & Science Education*, 4(1), January 2009, 1–23.
- Jeronen, E. & Kaikkonen, M. (2002). Thoughts of children and adults about the environment and environmental education. *International Research in Geographical and Environmental Education*, 11(4), 341–353.
- Jeronen, E., Kaikkonen, M. & Lind, A. (2008). Investigating Students', Teachers' and Parents' Conceptions about Environment, Health and Health Education. *The New Educational Review*, 14(1), 102–118. <http://www.educationalrev.us.edu.pl/issues/volume-142008/>
- Kaivola, T. & Rikkinen, H. (2003). *Nuoret ympäristöissään. Lasten ja nuorten kokemusmaailma ja ympäristömielikuvat*. Tietolipas 199. Helsinki, Finland: SKS.
- Karanja, S. G. (2010). The Influence of Environmental Education on Conservation among Secondary School Students in Nakuru Town Municipality. Graduate Student thesis. Retrieved January 2, 2019, from http://erepository.uonbi.ac.ke/bitstream/handle/11295/3665/Karanja_TheInfluenceofEnvironmentalEducationonConservationAmongSecondarySchoolStudentsinNakuruTownMunicipality.pdf?sequence=1&isAllowed=y.
- Kenya Institute of Education (2002). *Primary education syllabus* (Vol. 2). Nairobi, Kenya: Kenya Institute of Education.
- Kellert, S. (1996). *The value of life. Biological diversity and human society*. Island Press, Washington D.C.
- Klarin, T. (2018). The Concept of Sustainable Development: From its Beginning to the Contemporary Issues. Zagreb *International Review of Economics*

✂ *Business*, 21(1), 67–94. Retrieved November 16, 2018, from <https://doi.org/10.2478/zireb-2018-0005>

- Kollmuss, A. & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental education research*, 8(3), 239–260.
- Komossa, F., van der Zanden, E. H., Schulp, C. J. E. :Verburg, P. H. (2018). Mapping landscape potential for outdoor recreation using different archetypical recreation user groups in the European Union. *Ecological Indicators*, 85, 105–116. <https://doi.org/10.1016/j.ecolind.2017.10.015>
- Lincoln, S. Y. & Guba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage.
- Loughland, T., Reid, A. & Petocz, P. (2002). Young peoples' conceptions of environment: a phenomenographic analysis. *Environmental Education Research*, 8(2), 187–197.
- Loughland, T., Reid, A., Walker, K. & Petocz, P. (2003). Factors influencing young people's conceptions of environment. *Environmental Education Research*, 9(1), 3–19.
- Mogensen, F. & Schnack, K. (2010). The action competence approach and the 'new' discourses of education for sustainable development, competence and quality criteria. *Environmental Education Research*, 16, 59–74.
- Mutisya, S. M. & Barker, M. (2011). Pupils' environmental awareness and knowledge: A springboard for action in primary schools in Kenya's Rift valley. *Science Education International*, 22(1), 55–71.
- Neisser, U. (1982). *Kognitio ja todellisuus*. Helsinki: Weilin+Göös.
- OECD (Organisation for Economic Co-operation and Development) (2005). Definition and Selection of Key Competencies. Executive Summary; OECD: Paris, France.
- Petocz, P., Reid, A. & Loughland, T. (2003). The Importance of Adults' Conceptions of the Environment for Education. *Australian Association for Research in Education 2003 Conference Papers* (pp. 1–11).

- Plieninger, T., Dijks, S., Oteros-rozas, E. & Bieling, C. (2013). Assessing, mapping, and quantifying cultural ecosystem services at community level. *Land Use Policy*, 33, 118–129.
- Ramsey, J. M., Hungerford, H. R., & Volk, T. L. (1992). Environmental Education in the K-12 Curriculum: Finding a Niche. *Journal of Environmental Education*, 23(2), 40.
- Republic of Kenya, (2007). *Secondary School Syllabus*: (Vol. 4, September 2007). Nairobi: KIE.
- Rieckmann, M. (2012). Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures*, 44, 127–135.
- Rivkin, M. S. (1990). Outdoor Play– What Happens Here? In S. Wortham, & J. L. Frost (Eds.), *Playground for young children. National survey and perspectives*. A Project of the American Association for Leisure and Recreation. An Association of the American Alliance for Health, Physical Education, Recreation and Dance (pp. 200–223). Retrieved March 8, 2019, from https://archive.org/details/ERIC_ED326492/page/n199.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Shepardson, D.P; Wee, B.; Priddy, M.; Harbor, J. 2007. Students' mental models of the environment. *Journal of Research in Science Teaching*, 44(2), 327–348. DOI 10.1002/tea.20161.
- Smith, E. R. & Mackie, D. M. (2007). *Social Psychology*; Worth Publishers: New York, NY, USA. ISBN-13: 978-1841694092.
- Tadaki, M., Sinner, J. & Chan, K. M. A. (2017). Making sense of environmental values: a typology of concepts. *Ecology and Society*, 22(1), 7. Retrieved July 24, 2019, from <https://www.ecologyandsociety.org/vol22/iss1/art7/>
- Titman, W. (1994). *Special Places, Special People: The Hidden Curriculum of School Grounds*. UK: World Wide Fund For Nature/ Learning through Landscapes.
- UN (United Nations Sustainable Development) (1992). *United Nations Conference on Environment & Development Rio de Janeiro, Brazil 3 to 14 June 1992*.

Agenda 21. <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.

UNESCO (2017). *Education for Sustainable Development Goals. Learning Objectives*. Paris, France: UNESCO.

UNESCO-UNEP (1978). *Intergovernmental conference on environmental education organised by Unesco in co-operation with UNEP 14 - 26 October 1977*. Final report. ED/MD/49.Paris. Retrieved January 31, 2019, from http://www.gdrc.org/uem/ee/EE-Tbilisi_1977.pdf.

Whitley, C. T., Takahashi, B., Zwickle, A., Besley, J. C. & Lertpratchya, A. P. (2016). Sustainability behaviors among college students: an application of the VBN theory. *Environmental education research*, 24(2), 1–8. <https://doi.org/10.1080/13504622.2016.1250151>

Wiek, A., Withycombe, L. & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6, 203–218.

Wolff, L-A., Sjöblom, P., Hofman-Bergholm, M. & Palmberg, I. (2017). High Performance Education Fails in Sustainability? – A Reflection on Finnish Primary Teacher Education. *Education Sciences*, 7(32). Retrieved October 27, 2018, from <https://www.mdpi.com/2227-7102/7/1/32>. doi:10.3390/educsci7010032.

Yencken, E., Fien, J. & Sykes, H. (2000). The research. In E. Yencken, J. Fien & H. Sykes (Eds.), *Environment, education and society in the Asia-Pacific, Local traditions and global discourses* (pp. 28–50). New York: Routledge.

Yli-Panula, E. & Eloranta, V. (2011). The landscapes the Finnish children and adolescents want to conserve – a study of the pupils' drawings in the Basic Education. *Nordidactica*, 2, 35–63.

Yli-Panula, E., Grönlund, E. & Eloranta, V. (2012). School children's drawings of landscape they would like to conserve and how the drawings reflect their environmental conceptions. In *Proceedings of the Joint International Conference of the Australian and Australasian Association for Research in Education*, Sydney, Australia, 2–6 December 2012.

- Yli-Panula, E., Matikainen, E., & Eloranta, V. (2010). Säilyttämisen arvoiset maisemat ympäristösuhteen kuvaajana. In R. Korhonen, M-L. Rönkkö & J. Aerila (Eds.), *Pienet oppimassa* (pp. 154–170). Turku: Turun yliopisto.
- Yli-Panula, E., Persson, C., Jeronen, E., Eloranta, V. & Pakula, H-M. 2019. Landscape as experienced place and worth conserving in the drawings of Finnish and Swedish students. *Education sciences*, 9(2), 93. <https://doi.org/10.3390/educsci9020093>