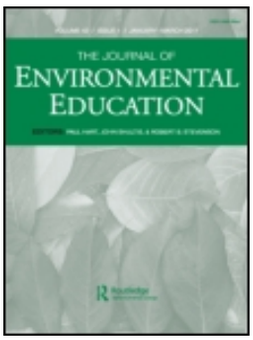

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Ria Ann Dunkley

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Learning at eco-attractions: Exploring the bifurcation of nature and culture through experiential environmental education

Ria Ann Dunkley

Cardiff University, Cardiff, United Kingdom

ABSTRACT

This article explores informal environmental education (EE) experiences at eco-attractions. A consortium of three UK-based environmental charities designed an eco-attraction-based EE program aiming to inspire responses to environmental change. Over six months, educators at six eco-attractions delivered this two-day program to 430 young people. This article conveys qualitative insights into learning experiences at three participating eco-attractions. The study illustrates that experiential learning at eco-attractions provided unique opportunities to explore nature-culture connections. The program also appeared to enable novel confrontations of current ecological crises, including climate change. Furthermore, the experience influenced some young people's perceptions of how such crises might affect their futures.

KEYWORDS

botanical gardens; eco-attractions; environmental education; experiential learning; nature reserves; plant blindness; sustainability education

Introduction

From school gardens (Bowker & Tearle, 2007), to forest conservation pedagogy (Dickinson, 2011) and citizen science (Brossard, Lewenstein, & Bonney, 2005), informal EE programs are burgeoning. EE scholars have explored how these and other examples of experiential learning influence environmental attitudes and behavior (Ballantyne & Packer, 2009; Duerden & Witt, 2010), nurture systems thinking for sustainable development (Dieleman & Huisingh, 2006) and encourage action for sustainability (Higgins, 2009). They have also begun to consider how teaching beyond the classroom inspires relational understandings (Hung, 2014; Mannion, Fenwick, & Lynch, 2013) and enhances educational attainment (Payne & Wattchow, 2010; Skinner & Chi, 2012). In addition to these examples, many eco-attractions, such as botanical gardens and nature reserves, appear to offer valuable opportunities for experiential EE. For example, Drissner, Steigmüller, and Hille (2013) revealed that learning in botanical gardens enhances children's biodiversity knowledge. Moreover, Sellmann (2014) and Sellmann and Bogner (2013a, 2013b) have noted the effect of botanical garden EE programs on young people's environmental knowledge and attitudes. Notwithstanding these recent contributions, there remains much scope for in-depth, qualitative studies of such learning experiences (Zhai & Dillon, 2014).

This article explores the impacts of an eco-attraction EE program developed by a consortium of three UK-based environmental charities. The program was State-funded for six months. It aimed to enhance young people's understandings of connections to nature to improve their capacities to respond to ecological crises. In total, 430 13- to 24-year-olds participated at one of six eco-attractions, operated by the three consortium partners. These young people were recruited from 26 schools and colleges across England. Presented within this article are findings of a qualitative study involving three cohorts of young people, each participating at one of three eco-attractions

CONTACT Ria Ann Dunkley dunkleyra@cardiff.ac.uk Sustainable Places Research Institute, Cardiff University, 33 Park Place, Cardiff, CF10 3BA, United Kingdom.

selected as research settings. This article highlights emergent research themes using extracts from interview narratives of 24 secondary school students and four accompanying schoolteachers who participated in these cohorts. The study illustrates that experiential learning at eco-attractions appears to provide unique opportunities to explore nature-culture connections. The program also seemed to enable novel confrontations of current ecological crises, including climate change. For some, the experience influenced perceptions of how such crises might affect their futures. The article concludes with implications for EE theory and practice. These implications will also interest those studying social responses to ecological crises. I begin by briefly contextualizing EE within eco-attractions, connecting to a broader discussion of experiential learning within current EE literature.

Literature review

The term eco-attraction emerged from ecotourism studies, referring broadly to natural attractions (Orams, 1995). Here the narrower definition adopted by The Eco-attraction Group (www.ecoattractions.com) is used to consider attractions that emphasize conservation goals. These include aquariums, arboretums, and—of particular interest here—botanical gardens and nature reserves. Contemporary eco-attractions are increasing in number, yet botanical gardens have been publicly accessible since the 17th-century (Alexander & Alexander, 2007). Such eco-attractions often fulfil research and educational roles, provide public entertainment and advocate nature appreciation (Davis, 1996). Sites typically host numerous school visits each year and offer public engagement courses.

As is the case with many eco-attractions, EE was a central component to the work of those in this study. Recently, researchers have begun to argue that EE ought to go beyond celebrating learning within natural environments to address human disconnections from nature (Bonnett, 2007; Rennie, 2008). Eco-attractions arguably provide ideal settings, where "experience, perception, cognition and behaviour" (Kolb, 1984, p. 21) combine to engage people with ecological issues holistically. For example, plant-centered eco-attractions may provide opportunities to overcome what Wandersee and Schussler (1999) term "plant blindness." These authors suggest that many modern young people have been socialized to regard animals as more significant than plants, resulting in ignorance of the role of plants within ecosystems. By offering opportunities to enhance individuals' plant knowledge, while also facilitating human-plant interactions, eco-attractions could play a key role in tackling "plant blindness," which is arguably becoming increasingly common (Struwe, Poster, Howe, Zambell, & Sweeney, 2014, p. 159). Moreover, Braund & Reiss (2006) argue that eco-attractions such as botanical gardens are repositories for exotic specimens, which act as a reference for teaching about environmental crises and sustainability. Although acknowledging that these attractions offer encounters with a "presented world," as opposed to the "actual world," they suggest they are credible and complementary environments for out-of-school learning. In the context of ecological crises, the opportunities that eco-attractions provide for experiential learning, albeit within a "presented world," may become increasingly significant. This is especially the case when we consider that some eco-attractions offer opportunities to confront the effects of global issues, including climate change, through their collections (Sellman & Bogner, 2013).

Methods

The previous review implies there is scope for exploring impacts of experiential EE in an eco-attraction context. This study, therefore, aimed to gain deeper understandings of young people's experiences at three eco-attractions. Difficulties associated with determining causal, attributable results from EE interventions (Hendee, 1972) have created a shift toward critical understandings of EE pedagogy (Huckle, 1993; Stables & Scott, 2001). A qualitative, interpretive research approach has thus been adopted here, providing meaningful insights into individual learning experiences, rather than generalizable findings (May & Williams, 1998).

Research settings

The study included one site operated by each of the consortium's three environmental charity partners. This equated to three of the six participating eco-attractions. The first site was a botanical garden in Cornwall, founded at the beginning of the 21st century. The second site was a country estate in West Sussex, which hosted conservation areas. The third site was a large nature reserve and wetland in Essex. The three investigation sites were selected based on cohorts' willingness to participate, sufficient cohort size, and convenience for education teams. Conducting studies at three sites enabled reflection on the diverse contexts offered by each partner while ensuring the study size was manageable. I gained a rich appreciation of learning at eco-attractions by conducting in-depth interviews with secondary school students and their accompanying schoolteachers. I also gathered further contextual insights by observing the two-day program at the three sites and through analyzing course materials.

Environmental education program outline

The EE program understudy had five key aims. These were to demonstrate human dependency upon a non-human world, to share the contemporary thought on climate change and related implications, and to explore business responses to environmental challenges. More broadly, it aimed to examine opportunities that might exist in a changing world, for example, in the emerging Low Carbon Economy (LCE) and to provide encouragement for sharing ideas. Each eco-attraction used its unique experiential setting to explore different human-non-human network dynamics. For example, the botanical garden housed a large tropical display, providing a locale to discuss dependency on unseen destinations. The country estate hosted a seed bank, which provided a tangible focus for understanding the significance of retaining seed stocks for future generations. At the nature reserve, teams used geographic information system (GIS) devices to explore interdependence through an ecosystem services approach. Throughout the two-days, all education teams also used soundscapes, everyday material objects, and their collections to emphasize human-nature connectivity and the complexities associated with acting sustainably. For example, an emphasis was often placed upon how non-human actors provided habitable atmospheres and supplied essential medicine, food, clothing, and building materials.

Study participants

The three study cohorts each involved 12 to 13 students who were currently completing compulsory secondary education. Of the 38 students who participated in the three cohorts, all were in school year 10, except for two from year nine. The cohorts were of mixed abilities and backgrounds. Table 1 provides a comprehensive summary of their profiles. The first study cohort participated in the program at the botanical garden. This cohort was comprised of 13 students. Ten of these students came from a secondary school in Derbyshire; the remaining three were from a Cornish school. Interviews were conducted with 11 students, four females and seven males, aged between 14 and 15 years. The second study cohort participated in the program at the Country Estate. This cohort was comprised of 12 students from a school in East Sussex. Interviews were conducted with five 13- to 15-year-olds from this

Table 1. Interviewee profiles.

Site	No. of Participants	No. of Interviews	No. of Teacher interviews	Student Gender	Student Age	Student Ethnicity	School
Botanical Garden	13	11	2	4 female 7 male	14–15	7 White 4 Asian	Derbyshire & Cornwall
Country Estate	12	5	1	3 female 2 male	13–15	5 White	East Sussex
Nature Reserve	13	8	1	1 female 7 male	14–15	7 White 1 Black	Essex
Total	38	24	4	8 female 16 male	13–15	19 White 4 Asian 1 Black	N/A

cohort, two males and three females. At the nature reserve, the third cohort of 13 students from a local school participated. For this final cohort, seven males and one female (14- and 15-year-olds) were interviewed. In sum, 24 interviews were conducted with students. The four schoolteachers who accompanied the cohorts were also interviewed. Constraints to involving full cohorts in the interview process included student availability and program time constraints.

Analysis and interpretive approach

This article seeks to provide meaningful insights into key themes arising from student experiences, rather than attempting to generalize indisputable truths. Therefore, it uses excerpts from participant interviews to support emergent themes. The interview process was guided by conversational (Clandinin & Connelly, 2000) and interactive interviewing (Ellis, Kiesinger, & Tillmann-Healy, 1997) principles. This process encouraged participants and their schoolteachers to direct discussions.

Interviews were transcribed, analyzed and interpreted using poetic structure narrative analysis (Gee, 1991). This technique is based upon the perspective that all speech is a form of poetry. It provides a comprehensive structured process for deconstructing interview accounts. It also gives credence to research participant subjectivities throughout transcription and interpretation. It is attentive to both what is said and how it is said (Riessman, 1993). Within this study, employing this analytic technique involved multiple listenings of audio recordings noting linguistic devices used, such as metaphors, similes, verb tenses, and keywords. This notation was overlaid onto written transcripts. Transcripts were then organized in accordance with structural poetic devices employed by interviewees, including frames, parts and stanzas. Finally, texts were interpreted within the wider program and social context. Poetic structure narrative analysis provided access to the most significant memories for participants while avoiding imposing the researchers' viewpoint. The next section discusses extracts from schoolteacher and student narratives. Participants consented in writing to being involved in the study. However, all names have been changed within this study.

Learning narratives

The three main themes emerging from narratives as program impacts (connections with plants; sensitization to our role in ecological crises; and questioning future ecological provocations) are analyzed and interpreted here.

Awe in nature: Connecting to plants

A new appreciation of plant roles within ecosystems was a major theme emerging from many student narratives. This alone is not a new insight given that several studies have identified that learning within eco-attractions, such as botanical gardens, encourages such knowledge acquisition (Braund & Reiss, 2006, Nyberg & Sanders, 2014; Sanders, 2007, Winther, Sadler, & Saunders, 2010; Zhai, 2012). What is novel is that the EE program understudy explicitly connects plant life to everyday objects and experiences. In reflecting upon the programs' value, Gabriela, a schoolteacher at an urban school in Sussex, where sustainability was being given increasing attention, felt the program benefited her students because, as she states "they had no idea how important plants were." She describes a lunchtime session when students were told they could only eat foods that had not encountered plants. She suggests:

No matter what you teach them in a classroom, it's when all of a sudden they are told they can't eat their lunch [because] it has had contact with plants, you couldn't touch anything, not even plastic. I think that made them sit back and think.

Similarly, the exercise that Jo, a schoolteacher from a city school in Derbyshire, felt had been most significant for her students tasked them with visiting the eco-attractions captive rainforest. Once there, they recorded the 10 plants they would like to carry into their futures. Jo stated:

> I've had a few say about the biome, how wonderful that was. They just didn't know that there were that many things there because you hear about the rainforest going all the time, but to actually go in there, and to have seen all that. They suddenly had to think "I'm going to need all of this. I'm going to need that." I think that sank in.

These two schoolteachers suggest that the eco-attractions' experiential learning environment enabled their students to appreciate the role of plants in sustaining human life. This may be significant given that, as Latour (2014) argues, it is increasingly difficult to witness interconnections between cultural life and the non-human world, particularly on a global scale. This difficulty arguably manifests itself through a phenomenon such as "plant blindness" (Wandersee & Schussler, 1999). However, these schoolteachers appear to suggest that visiting eco-attractions enables appreciation of human-nature connectivity.

For some students who participated in the program, a novel appreciation of plant roles was coupled with a sense of awe inspired by nature (Davis, 1996) and greater respect for the non-human. For example, 14-year-old John from Sussex felt the course had "opened his eyes" to the role of plants in sustaining human life:

> I didn't realize that everything came from plants that was really quite an amazing thing.

John's narrative reveals that this insight "hit him the most." This seemed to encourage him to want to respond to ecological crises and he proclaimed:

> If they come about something that individuals can do well, then I will definitely do it, I'm definitely up for helping doing something.

As a year-nine "eco-prefect," John was motivated to take part in the program to "find out more" to share his knowledge with younger students. He appears to see himself as acting as a representative for these students in a larger peer-learning process for sustainability (de Vreede, Warner, & Pitter, 2014). The experience therefore also fulfilled a social function, enabling him to provide leadership within his school.

Sensitization to our role in ecological crises

Davies, Sanders, and Amos (2015) have recently suggested that outdoor classrooms may enable students to reimagine their place in nature. The previous accounts reveal that the EE experience understudy appeared to encourage many participants to question some established views and to want to take ownership of ecological crises. This is promising in light of the lack of political will to tackle such issues. Currently, collective unresponsiveness leads the media to present ecological crises as "not only a story, not only a drama, but also the plot of a tragedy" (Latour, 2014, p. 14). Resultantly, many individuals arguably adopt a state of "climate quietism," or "practical climatoscepticism" (Latour, 2013, p. 4). Indeed, some students appeared apathetic about issues such as climate change and resource depletion. However, many also told stories about how the program had changed their perception of their relationship to the environment. For example, for 15-year-old Helen from Essex, participating in the program at a nature reserve was an experience that, she explains, encouraged her to "look at things differently." She emphasized that the visit enabled her to appreciate the scale of human dependency on plants. To this end, she states:

> I see people pulling plants off trees and they're just like mucking about with it and now I realize that they're taking away a bit of someone's breath … I look at things differently now. Like, if I see a condom I'm likethat's actually made out of a plant.

Helen describes what she feels are the personal implications of this in the following extract, where she explains that previously, she had assumed that lack of collective action on climate change was a reflection of inconsequentiality:

> I thought climate change; they're going on about it … but then no-one's making such a big deal out of it. So we shouldn't. So it won't be as bad as they're saying and then when I found out a bit more, I actually realized that people are a bit ignorant to ignore it because this is our futures they're affecting.

For some students, like Helen, experiential learning at an eco-attraction helped to make nature-culture connections explicit, through highlighting the significance of plants to contemporary society (Hall, 2011). Moreover, the program seemed to offer her an opportunity to appreciate the magnitude of current ecological crises. Nature appears as indispensable for the first time. She thinks her:

> …whole [school] year [group] should take part … [in the program because] … when you get there [the nature reserve], you just get a complete change of mind.

The program also appeared to have had a cascading effect upon Helen's daily life. For example, after the experience, she continued to engage her friends and family in conversations about themes discussed during the visit to the eco-attraction:

> I just keep on remembering it, and then spread the word to my friends. Now my friends know that most of the things we use have got plants in, which they didn't know before.

This suggests that experiential EE, which makes nature-culture connections visible, can also expose the "feedback loops" (Latour, 2011) between nature and culture that lead to ecological crises. Moreover, the effects of such learning appear to reverberate into young people's everyday lives.

Reverberations: Questioning future ecological provocations

Many students and their schoolteachers felt the EE experience would lead to greater reflection on everyday decisions, rather than to immediate pro-environmental behaviors. For example, schoolteacher Gabriela referred specifically to the effectiveness of a gift shop-based activity at the nature reserve. Students conducted a stock audit while reflecting on the attractions procurement strategy. Gabriela believed that:

> because it moved them on to look at how we care for our environment … I know they are going to go back from yesterday, looking at some of our food and looking at whether they are going to be fair-trade, organic, or buy locally.

Furthermore, some students appeared to demonstrate an ability to think critically about sustainability's triple-bottom line. For example, 14-year-old John used an occurrence during the stock audit as a metaphor to describe what he felt were the complexities of adopting sustainable behaviors:

> in the shop, we found a book and it was all about recycling and telling you, "you should do this," "you should do that" and the book wasn't actually made out of recycled material! So at first glance, it's really sustainable, but when you actually look on the back, it's not that great, but then I guess the shop has to make a profit.

This passage demonstrates how students become aware of the contradictions of sustainable consumption (Kopnina, 2014).

Although the program may not have inspired significant immediate pro-environmental action, many students and schoolteachers stated they had developed capacities and critical faculties, which may lead to further involvement with conservation efforts (Wals, Brody, Dillon, & Stevenson, 2014). For example, many stated that the program was part of their own and their school's sustainability journey. In discussing its longer-term effect, Jo, a schoolteacher, said it had "planted a seed." Another teacher, Susan, stated that now students were attentive to ecological issues "it just needs accommodating." Some students and schoolteachers had already begun to make plans, resulting from the program. This was encouraging, given that actions for sustainability are intricately intertwined within daily life. Many of the actions they proposed extended beyond pro-environmental behaviors already encouraged at school to include, for example, assuming leadership roles. For some, this involved plans to establish school gardens and to facilitate discussions with peers. Some students had also begun to think about how ecological issues and sustainability thinking might affect their future careers.

Conclusions

It is challenging to isolate the impacts of short-term courses, such as the two-day program discussed here. Individual personal life courses, prior experiences, and wider sociocultural contexts will also have a strong influence on perceptions, motivations, and resulting actions. Therefore, by exploring learning journeys at eco-attractions, this article instead provides in-depth insights into how young people from a variety of backgrounds responded to particular experiential techniques and settings of EE. Doing so enabled us to appreciate how such pedagogy helps young people to see and sense ecological issues (Tillmann-Healy, 1996). This article has focused upon three central insights emergent from participant's narratives. Such insights into the impacts of experiential learning within eco-attractions may well be useful to educators and other practitioners, and to policy makers and academics working within sustainability education.

A key study insight is that pedagogic experiences offered by eco-attractions can help to re-establish affective connections between the natural world and young people's everyday lives. In particular, the experience appears to have afforded them a new appreciation of the significance of plants. This has implications for environmental educators, conservationists, sustainability scientists, and eco-attractions themselves, given that making human-nature connections visible is recognized as central to addressing current ecological crises (Latour, 2014). Furthermore, once young people had begun to appreciate human-non-human connectivity, these experiential milieus also appeared to help sensitize many of those interviewed to human roles in ecological crises. This may have been heightened, in some cases, by the capacity for exotic plants and wildlife within these "presented worlds" (Braund & Reiss, 2006) to resonate with students (Genovart, Tavecchia, Enseñat, & Laiolo, 2013). For example, in many cases, witnessing exotic plants appeared to enable contemplation of how local actions affected a global environment. This takes on additional significance when considering climate change, a global and abstract challenge that can be difficult to comprehend.

Finally, the study also enabled understanding of factors influencing outcomes of EE learning processes. This EE program aimed to encourage individuals to question their existing ecological knowledge and to explore and discuss sustainability further, rather than seeking to establish fixed pro-environmental behaviors. This progressive approach to EE appears to be effective. This is perhaps because the program sought to accommodate young people's intricate social and cultural contexts, which seemed to affect their capacities to comprehend and address ecological issues. To this end, though the young people involved in this study were of similar ages and while many demonstrated ecological awareness, motivations to respond to ecological crises varied based on student influences and interests. This suggests that those seeking to engage learners in EE need to recognize participant subjectivities within program design. The study highlights that effective EE program outcomes ought to accommodate a variety of responses from individuals and groups. This has implications for informal education at all levels within eco-attractions, as well as for EE more generally.

Within a broader context, this study supports arguments that suggest gardens and nature reserves offer intrinsically valuable opportunities to reconnect with the natural world. Over the past half century, the importance of natural spaces within urban contexts has been increasingly acknowledged (Goode, 2011). For instance, botanical gardens in the United States have come to be regarded recently as "urban nodes of science-based education that can harness urban interest in agriculture" (Novy & Dotson 2015, p. 40). All study sites exist within urban or peri-urban contexts. This study provides insights into interactions within unique eco-attraction contexts that appear to influence perceptions of and responses to ecological crises. EE initiatives delivered at eco-attractions may therefore complement other urban programs, such as community-based science programs and nature festivals that contribute to addressing disconnections between the human and natural world (Goode, 2014).

There is much scope for exploring informal learning within eco-attractions empirically (Ardoin, Clark, & Kelsey, 2013), despite burgeoning consideration of EE and related sustainability education. This article makes a clear contribution to EE, by interpreting the effectiveness of learning within eco-attractions, which emerge as spaces for nurturing ecological citizenship. It challenges the

assumption that short-term EE programs are inconsequential. Experiential learning within eco-attractions appears to have the capacity to challenge the nature-culture dichotomy. Resultantly, such programs appear to facilitate the telling of the new "geo-stories" that Latour (2013) argues will be crucial to addressing ecological crises.

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