Chapter 8
Earth Education: Magical Learning Adventures for Living More Lightly

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8.1 Introduction

Earth education is the process of helping people live more harmoniously and joyously with the natural world (Van Matre, 1990, p. 87). Originally framed as an innovative way of doing nature education and then environmental education in its early days in the 1960s and 1970s, the term "earth education" was created in 1984 to distinguish this work from mainstream environmental education (Van Matre, 1990). To understand what earth education is today and where it is going in the future, it is important to understand where it has come from.

Acclimatization was the foundation for earth education. Created in response to Van Matre's frustrations with traditional nature education in his work in summer camps, Van Matre coined the term:

> Let's help our campers acclimate themselves to their own environment. To understand it on their own terms, and its own merits… We call it *acclimatization*. (Van Matre, 1972, p. 10)

The goal of acclimatization was "a breaking down of barriers to the point where one human being can feel himself not only completely surrounded by his environment but totally involved with it as well." (Van Matre, 1972, p. 7). Van Matre and colleagues created innovative ways of helping people build a love affair with the earth through immersive experiences in nature, highly participatory activities that helped young people expand their awareness while also better understanding the ecological processes that sustain all life, including humans.

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The key components of Acclimatization were concepts, senses, solitude, and mechanics (Van Matre, 1979). Ecological concepts were the focus of the knowledge portion. To understand environmental issues, we need to understand how the ecological systems that support all life function. Feelings are important because we protect what we care about. Opportunities for solitude in nature are important for personal connections to the flow of life. The mechanics turned out to be vital for breaking down the barriers people have erected to immersing themselves in nature; simply visiting a natural area is most often not sufficient. Innovative experiences are necessary. However, Acclimatization was much more than these components because of the magic that permeated the experiences.

> In Acclimatization, the medium is the magic. This is not to imply the magic of charlatanism, but the magic of ecstasy. Much of it comes simply from doing the usual in an unusual way. It's not showing, but sharing; not forming, but feeling. It's non-verbal, gut-reaction. Often spontaneous in origin, it can be stimulated by the correct mixture of the necessary ingredients. In the end, it is overpowering. (Van Matre, 1972, p. 25)

Moving beyond summer camp programs, the first acclimatization program designed for school groups was Sunship Earth (Van Matre, 1979). Based on a week-long school camp model, Sunship Earth brought the concepts, feelings, solitude, and mechanics, along with the catalyst of magic, to a new kind of education program for 11–12-year-old children. Using the analogy of Earth as a spaceship powered by the energy of the sun, the participants focus on learning the operating principles of the sunship to be come better passengers and crewmembers. In Concept Paths, seven fundamental ecological concepts are taught in 15 different outdoor, participatory experiences that aim to bring these abstract concepts into the concrete: energy flow, cycling, diversity, community, interrelationships, change, and adaptation. Additional experiences help to develop feelings of connection with nature, including Discovery Parties, Solitude Enhancing Experiences, and Immersing Experiences. At the end of the five days, participants make pledges to adopt new environmental behaviors to lessen their impact on the sunship when they return to school and home.

Sunship Earth was the beginning of a series of programs that have been developed beginning in the 1980s, at the same time that Acclimatization became Earth Education. All earth education programs are based on three primary components: understandings, feelings, and processing. The four ecological concepts in earth education programs are: flow of energy, cycling of materials, interrelating of life, and changing of forms. The four feelings are: joy at being in touch with the elements of life, kinship with all living things, reverence for natural communities, and love for the earth. Processing also consists of four elements: internalizing understandings for how life works on the earth, enhancing feelings for the earth and its life, crafting more harmonious lifestyles, and participating in environmental planning and action.

The Institute for Earth Education (IEE) was established in 1974 with the original name of Acclimatization Experiences Institute. An international, non-profit organization, IEE consists of a networks of volunteer Associates around the world. A physical home in a secluded grove in West Virginia serves as the office, and there are affiliates and branches of IEE in several countries. With no governmental,

foundation or grant support, IEE depends on sales of its books and materials, fees from workshops and speeches, and individual donations to maintain a very low budget operation.[1]

Today IEE is "an international band of professionals dedicated to transforming our relationship with the earth" focusing on Interpretation (the craft of enriching the experience of leisure visitors with places established for the public good) and Contemplation (opportunities to pause and savour the flow of life on this planet and ponder our relationship with it) as well as Education.

8.2 Programmatic Approach

A distinguishing characteristic of earth education is the emphasis on taking a programmatic approach, specifically designed in the late 1970s and early 1980s to contrast with the prevalent infusion approach in environmental education (Wohlers & Johnson, 2003). The infusion approach promoted the creation of activities that were meant to be infused into other subjects as a way to get environmental messages spread widely. Concerned about the lack of coherence to such an approach, the absence of any sort of overall framework or even identification of specific goals, and the clear message about the relative lack of importance of education for the environment conveyed by such an approach, Van Matre and Associates[2] focused on creating holistic programs. In this view, a program is a focused, sequential, cumulative set of learning experiences designed with specific outcomes in mind.

In the late 1970s, IEE began the creation of a set of model programs for all ages. Each program has the same overall goals: constructing ecological understandings, developing feelings, and changing actions and behaviors. In addition, each program is designed as a magical learning adventure using key structures and frameworks. Four programs have been completed and published: Sunship Earth (Van Matre, 1979), Earthkeepers (Van Matre & Johnson, 1988), Sunship III (Van Matre & Johnson, 1997), and Rangers of the Earth (Van Matre & Farber, 2005). Others are in the development and piloting phase, while some are still just ideas.

8.2.1 Magical Learning Adventures

A vitally important element that emerged from the Acclimatization work was "magic". All earth education programs are designed to be experienced by participants as magical learning adventures. They are full of excitement, surprises, and discoveries. The aim is for a feeling of being on a special adventure, while learning

[1] www.ieetree.org

[2] Associate is the term used for the volunteer staff of The Institute for Earth Education.

along the way. Of course, such a feeling is not easy to design. In addition, magic must be used in moderation; too much magic results in that becoming the message, overwhelming the learning. For those reasons, earth education programs go through years of design and piloting.

As an illustration, the Earthkeepers program (Van Matre & Johnson, 1988) uses several elements that contribute to the sense of participation in a magical learning adventure. Participants ages 9–11 are invited by a mysterious character known only by the initials E.M. to become Earthkeepers. A letter from E.M. and an adventure map that arrives in the classroom sets the stage. Throughout the program, participants earn keys that open boxes to learn secret meanings of E.M.'s initials. Following a map to make discoveries, figuring out secrets, the mysterious nature of E.M., and earning keys that unlock boxes to reveal secrets all add to the feeling of adventure. The activities themselves, highly participatory, outdoor experiences that fit into the overall storyline of the program, also contribute.

8.2.2 Structure

While earth education programs can seem somewhat spontaneous to participants, in reality they are highly structured. Each program has specific components that focus on understandings, feelings, and processing those experiences to transfer to life at home and at school. For example, in the Earthkeepers program, participants earn a **K**nowledge key by participating in four activities, one each for the major ecological concepts of energy flow, materials cycling, interrelationships, and change. The **E**xperience key is similarly earned in four activities, focused on solitude, observation, discovery, and immersion. The final two keys, for **Y**ourself and **S**haring are earned in the program follow-through back at home and school.

This structure also serves as an organizer for the program. **K**nowledge-**E**xperience-**Y**ourself-**S**haring, as the four components of the program are also a mnemonic device – KEYS. At each stage, participants earn a key and unlock a box to reveal a secret meaning of E.M. (another mnemonic device). For example, on opening the K box, they discover that the secret meaning of E.M. for Knowledge is Energy and Materials. That serves as another organizer and reinforcer because the flow of energy and cycling of materials are the key ideas of the Knowledge activities. Of course, earning keys and using them to open locked boxes to reveal secret meanings of a mysterious character's name contribute to the "magic" of the learning adventure.

Building on the initial Acclimatization work, the activities in each portion of the program are structured according to the goals for that section. Knowledge activities focus on making abstract ecological concepts concrete through the use of props and materials as well as using analogies to experiences relevant to the participants. In the Sunship Earth program, for example, participants become workers in a "food factory". They take apart air and water molecules (table tennis balls with Velcro) and recombine them into molecules containing stored sunlight energy, the food for

all life. Experience activities focus on breaking down barriers to allow more direct experience with nature. One example activity is the Earthwalk, a series of mini activities that build awareness through awakening senses and viewing the familiar in unfamiliar ways. Magic Spots is another activity that provides participants with solitude in a natural setting to be in touch with the flow of life. All the activities take place outdoors where the ecological concepts can be seen in action and the participants can experience the natural world first-hand.

8.3 Learning Frameworks

8.3.1 Conceptual Learning

Ecological concepts, the processes that enable life, are the focus of the understandings in earth education programs. While there are many ecological concepts, four important concepts have been identified that are essential for understanding the processes of life on our planet. (1) Flow of energy: Energy flows from the sun to Earth, with some of it captured by green plants and then turned into food through the process of photosynthesis. When we eat, we get stored sunlight energy that fuels our bodies, but we use stored sunlight energy for many other things, including transportation, heating, and cooling, making products, and farming and processing food. Fossil fuels contain stored sunlight energy from plants and animals that died hundreds of millions of years ago, and our societies today are dependent on burning those fuels for most of our energy needs, causing numerous problems. (2) Cycling of materials: The matter of which all living and non-loving things are made is constantly recycled. Recycling processes such as the air and water cycles move materials from place to place and through different forms over time. We depend not just on the materials (our bodies are made of these materials) but also on the processes that move them. Too often, we add pollutants that travel in these cycles as well, becoming contaminants to systems as well as living things (including us). (3) Interrelating of life: Living and non-living things interact with each other constantly. Plants and animals both compete and cooperate with each other. Both depend on non-living things as well. Because of these complex and often hidden interrelationships, actions we take have broader effects than we intend, and these unintended consequences can disrupt the processes of life. (4) Changing of forms: Everything is constantly changing. Some change is immediate and readily apparent. Seasons change through the year, and all living things grow and eventually die. Other changes, such as shifting of landmasses, happen so slowly that we cannot see the change happening; we can only see stages of the change.

These ecological concepts are complex. The goal in earth education is to help participants construct big picture understandings of these ecological concepts rather than memorizing the details. For instance, participants learn that sunlight energy is captured and stored by green plants through photosynthesis, but they are not taught

the chemical formula for photosynthesis. In addition, the focus is on the processes of life, not the pieces. Attentions is paid to ways that living things interact with each other and with non-living things rather than to learning the names of the plants and animals. Conceptual understanding is favored over factual knowledge.

Conceptual activities in earth education programs are based on the Inform-Assimilate-Apply (I-A-A) learning model. Inform refers to participants obtaining information in a variety of ways, taking something in through observing, reading, listening to a description, and so on. This accounts for much of formal schooling, taking in information without the opportunity to do much with it, and so it is often not really learned and is easily forgotten. The next two steps of I-A-A are the important ones. To assimilate what they take in, participants need to do some thing with it, to engage with the knowledge. In earth education programs, the bulk of the concept activities are tasked with this, helping the participants work with the knowledge to better understand it and to help it fit with their prior knowledge and experience. Because these ecological concepts are abstract, i. e., one cannot see photosynthesis happening, the activities bring the concepts into the concrete so that the participants can interact with them. Finally, to truly learn something, it is important to use it, the applying stage. This happens at different levels. At the conclusion of each concept activity, participants find an example of the concept happening in immediate area, while longer-term application happens through applying the understandings back in the participants' schools and homes.

8.3.2 Developing Feelings

The early Acclimatization work made it clear that carefully designed experiences could help to break down barriers to interaction with nature and help participants develop positive feelings for the natural world. Leaders are guides who facilitate activities that help to overcome the reluctance to get too close, the desire for comfort, and the trepidation and even outright fear that too often reinforce the idea of nature as separate from us.

Solitude experiences are a frequent component of earth education programs. The busyness of our high-energy lives, even for children, means that many people have few opportunities for be quiet and alone, especially in a natural setting. Careful crafting is necessary to enable participants to have successful solitude experiences in nature, and participants are often sceptical and nervous about them. In the end, they are powerful experiences that for most participants are one of the most enjoyable and impactful parts of the programs.

Changing perspectives, enabling discovery, and immersing participants in nature are also important foci of activities that focus on developing positive feelings. Each requires different techniques, but it is the combination of thoughtfully planned experiences and leaders who act as guides that brings results in success.

8.3.3 Personal Actions and Behaviors

In much of environmental education, a major focus is to teach about environmental issues. Earth education takes a different approach, helping participants construct understandings of the systems of life so that they can better understand environmental issues. It is not that issues are not important to learn about; it is that first understanding the systems helps to better understand the issues later. It is not a matter of which is more important but a matter of the sequence of the learning.

Similarly, earth education is based on a sequence of actions and behaviors related to the environment. Starting where the learners are, the programs begin with individual actions and behaviors that participants can control. The idea is to help participants begin to make changes that can become habits that become part of their normal routine. This approach helps them to see that they can accomplish positive change regarding the environment, building a sense of agency.

Of course, individual behaviors and actions are clearly not sufficient to deal with the environmental crises we face. Group actions, policy changes, and political leadership are necessary. Those are difficult to begin with, however, especially in the case of young learners. Being successful in smaller, personal actions and behaviors can provide a solid foundation for expansion of the work over time.

8.4 Vignette: A Program in Action

A group of six early adolescents sit in a circle on the ground in a forest clearing, engaged in a discussion about the phrase “From this day forward, you must begin taking responsibility for your own actions and accepting the consequences of them.” as they prepare to return to home and school after a three-day/two-night Commencement Experience at an outdoor centre in a natural area outside of the city. They are participating in the earth education program Sunship III (Van Matre & Johnson, 1997).

Their journey began back at school with each young person receiving a card congratulating them on reaching an important Stage of Life along with an invitation to the Commencement Exercises, to prepare them for commencing the next stage of life. The class was split into small “sharing circle” groups to read and discuss their Guidebook to Sunship III, the third planet from the sun. Upon completion, each participant received a gift, a check for 1000 Solarians (units of sunlight energy) to cover the costs of the three-day experience.

On arrival at the centre, the young people registered, paying 500 Solarians for most of the energy and materials they would use over the next three days. The other 500 Solarians were deposited into a checking account, to be used as needed to purchase permits for the energy and materials they would use that were not covered by the basic fee. These were the energy and materials they have some control over, such as whether they take a short or long shower, use disposable paper serviettes or

reusable cloth ones, use electric appliances, and so on. Each evening, the participants took stock of the energy and materials they used that day and made plans for what they would need to purchase for the next day, focusing on how to use less each day.

With their permits in place, they took part in the opening ceremony, where they learned about the purpose of the experience, examining "perception and choice" as they consider their relationship with the earth. The remainder of the three days included outdoor activities focused on the key ecological systems that sustain life on the planet: energy, materials, interrelationships, and change. Throughout the experience, the sharing circle groups continued to meet to help each other make sense of what they were learning and experience.

On this final day at the centre, they are meeting to prepare to return to home and school to embark on a Quest to seek truth, adventure, and harmony as they craft lifestyles that will lessen their impact on the earth. Over the next several months, they will interview different role models who are using energy and materials wisely, demonstrating care for natural places and things, and developing a deep personal relationship with the earth. Sharing circles will continue to meet weekly to support each other in examining what they learn and figuring what they want to incorporate into their own lives.

8.5 Research

In the 1980s and 1990s, there were several small-scale research projects involving earth education programs. Most were qualitative in nature, done as master's theses and not published. However, two were published: Greenall Gough (1990) conducted case study of an Earthkeepers program. Keen (1991) conducted a mixed methods study of a Sunship Earth program.

In the last 20 years, more research has been conducted and published. Some studies have examined the implementation and effects of the Earthkeeper program (Činčera & Johnson, 2013; Manoli et al., 2014) and Sunship Earth program (Johnson & Manoli, 2008). These studies found significant increases in student understanding of ecological concepts, pre-environmental attitudes and values, and self-reported pro-environmental behaviour. Felix and Johnson (2013) investigated the classroom follow-through portion of the Earthkeepers program. Baierl et al. (2021, 2022) found consistent increases in both knowledge and attitude, and well as interesting relationships between the two, for participants in the Earthkeepers, Sunship Earth, and Sunship III programs. As part of a mixed methods, longitudinal study of students who participated in three consecutive earth education programs (Earthkeepers, Sunship Earth, and Sunship III) over a four-year period, Johnson and Činčera (2019) reported on how participants' understandings of ecological concepts developed over time. Other recent studies of earth education programs have investigated the relationships between attitudes and behaviour (Johnson & Činčera, 2015), issues related to the use of frameworks in programs (Činčera et al., 2020b), values (Činčera et al.,

2020c), empowerment (Činčera et al., 2020d), leaders views and implementation of experiential learning (Činčera et al., 2020a), the relationship between program characteristics and participants' values and behaviours (Johnson & Činčera, 2021), and the relationship between instructional strategies and program outcomes (Johnson & Činčera, 2022).

8.6 Conclusion

Fifty years after Van Matre's initial forays into helping young engage more deeply and personally with the natural world, what is the status of earth education? What have been the impacts of earth education on environmental education? What criticisms of earth education have arisen? Why has earth education not become more widespread? What changes are being implemented for the future? These are the issues for this concluding section.

Earth education work has concentrated on building programs that can be implemented around the world, providing workshops for program leaders, and publishing materials. In the 1980s and 1990s, earth education programs, workshops, and publications spread across North America, Europe, and Australia. In the early 2000s, the spread reached into Asia and South America. Dozens of earth education programs were operating in a wide variety of natural environments and in an even wider variety of cultures. In recent years, while earth education programs, workshops and publications are being established in some new places, particularly Asia, Latin America, and Central and Eastern Europe, the number of programs in many parts of the world has decreased. The major causes include declining educational funding, increased emphasis on standardized tests with accompanying limitations to programs such as earth education that often not considered to be core curriculum, and most recently, the global coronavirus pandemic, which has caused many program centres to close.

In contrast, the need to help people live more joyously and harmoniously with the natural world has certainly not decreased. People around the world are even more cut off from the systems of life that sustain us. Attention to the problem and calls for education to respond are increasing, with a proliferation of education approaches, many described in this book, that has increased. But earth education programs reach a relatively small number of people across the world, and many of those involved in environmental education with are either not aware of earth education or are critical of it. Why is that, and how has earth education influenced the field more broadly?

One reason that earth education is not as well known by environmental educators as it might be is the decision by Van Matre and Associates in 1984 to position earth education as an alternative to environmental education. Van Matre has been loudly critical of environmental education because of his concerns about, among other things, the prominent infusion approach and the focus on the pieces of life rather than the processes of life (see Van Matre, 1990). Little participation of earth

education in environmental education organizations and conferences has led to low visibility to those in the field. In addition, Van Matre's criticisms, issued because he feels strongly that we must have a more serious and widespread response to the environmental crises we face, have put off some people who have taken the criticisms personally.

The approach taken by IEE as an organization has also contributed to the reduced levels of impact. To maintain independence, IEE has avoided any sort of government or corporate support. Instead, the organization has relied on sales of books materials, workshop and speech fees, limited individual donations, and the labor of volunteers to survive. Given the severely limited income from these sources, it is remarkable that IEE still exists 49 years after its founding. The global pandemic, of course, had made the financial situation even more precarious, with the closing of many programs and a more than 2-year loss of income from workshops and speeches.

Another reason that earth education programs have not proliferated more widely is that they are more difficult to implement than many outdoor environmental education approaches. Good education is not easy and offering a high quality "magical learning adventure" is hard work. Staff preparation, materials needed to bring abstract concepts into the concrete and to engage learners in the outdoors, and the time required to have meaningful experiences, all contribute to financial and resource costs that can be prohibitive for some.

Beyond these limiting factors, critiques of earth education have also led to some educators turning their attention elsewhere. One area of concern has been about the inclusion of a focus on feelings, values, and attitudes. Many formal school systems often avoid promoting that they teach values. That is clearly not true (even decisions about what to teach are value-laden), but earth education's explicit and strong focus on feelings has led to concern by those who claim that we should teach only the facts.

Concern that earth education programs are "canned programs" that cannot fit the diverse contexts and cultures around the world has also been a concern for some. This is legitimate issue. How can one program be offered in such a wide variety of ecosystems and cultures and still be meaningful and relevant for all? This is topic deserving of much more space that available here, but here are some key points. The ecological concepts taught in earth education programs are universal. Each ecosystem in the world is unique because the conditions cause these systems to play our differently, but the ways energy flows and materials cycle are the same. Similarly, each earth education program is a magical learning adventure with a structure and organization as well as activities that are the same wherever implemented, but that adventure plays out differently in each location. Each activity is designed to facilitate an experience that enables the learners to engage with an ecological concept or develop feelings, and while the activity design is the same everywhere they are implemented, the experience is going to be different because of the unique environment of each location. Having had the opportunity to experience earth education programs in more than 40 locations around the world, I can attest to the successful and varied combination of engaging with universal ecological concepts with the uniqueness of each local environment that contributes to an experience is far from "canned".

While the programs can fit a wide range of contexts and local leaders can provide a great deal of support for helping the programs to fit with the learners, cultures, and places where they are being enacted, more can be done. More attention is now being paid to the importance of cultural relevance in education, including culturally responsive pedagogy (Gay, 2010) and culturally sustaining pedagogy (Paris & Alim, 2017). Researchers at the University of Arizona are embarking on a project to investigate ways of working with local communities to identify and operationalize culturally relevant perspectives and strategies to better connect earth education programs with the contexts and cultures of the local setting (Knox et al., 2022).

Finally, some have been concerned that earth education programs leave little opportunity for staff/leader creativity. The programs come with a set of pre-designed activities and structure. What is the role of leaders? Rather than being program designers, earth education program leaders are enactors and facilitators. In a way, it is similar to actors who bring a pre-designed play into life; each performance is unique even though the play is the same. But leaders are much more than actors because a key role is to facilitate the experience for the learners who are not passive observers but are also participating in the "play". Providing local examples, reinforcing the concepts and experiences, and enabling the participants to engage in the adventure are critical roles for leaders. Great leaders are vital to the success of earth education programs.

Acclimatization and earth education have had many impacts on outdoor environmental education beyond the actual programs. From the earliest days of Acclimatization, this work has been noted for bringing in the focus on the feelings. Sometimes branded as "those touchy-feely folks", personal engagement with the natural world in positive, immersive ways has been a highlight that has spread widely. The emphasis on a holistic approach as opposed to random isolated activities has also made inroads in the field more broadly. Possibly most importantly, the emphasis on the processes of life, constructing understandings of ecological processes, rather than on the pieces of life (names and numbers) has helped to turn the focus away from rote learning and nature education to toward examining how we live with the systems of life of our planet.

Given all of this, where is earth education today and how is it moving forward? There are some new and recent developments that build on prior work while addressing concerns that have arisen. The work of developing and disseminating holistic programs continues, including promoting and supporting existing programs such as Earthkeepers and continuing to develop new programs such as Lost Treasures for 8–9-year-olds and Earthlings for 2–5-year-olds. New ways of providing options in the fields are also being established. For example, Van Matre's most recent book, Earthwalks: An Alternative Nature Experience (2019), provides a framework and activities for leaders to use to offer nature experiences to learners of all ages, outside of full earth education programs. In a more radical departure from the building of holistic programs is the new venture, Earth Guides, designed to certify outdoor leaders who will create their own experiences. "An Earth Guide focuses on the processes of life not its pieces or places. An Earth Guide emphasizes the whole, not the parts. An Earth Guide stresses that a good relationship means not just loving the

earth, but living in a way that the earth will love us." (The Institute for Earth Education, 2022, p. 3).

Earth education for half a century has enriched the lives of many thousands of people, helping them to live more harmoniously and joyously with the natural world. There is much more to be done, and the urgency is increasing each year. The consensus is that we do not have another 50 years to learn to live in ways that lessen our impact on the systems of life that support us. In the hope that it is not too late for education to play a major role in confronting our environmental crises, new approaches in earth education are emerging at the same time that the long-established focus on holistic programs is being maintained.

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