Earth Education

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Summary and Keywords

Earth education is an alternative approach to environmental learning, which has been developed as a potential serious response to the environmental crises we face. With roots in frustrations with traditional nature education that led to the innovative Acclimatization program, earth education has grown into a more comprehensive approach to environmental learning. The early work of Acclimatization led to earth education. The programmatic approach used in earth education, with its components of ecological understandings, feelings, and processing, have led to innovative aspects such as the I-A-A (Inform-Assimilate-Apply) learning model and the inclusion of “magic.” The Institute for Earth Education is the non-profit organization leading this approach and its work under the leadership of Steve Van Matre helps to propel these ideas.

Keywords: earth education, environmental education, environmental learning, acclimatization, nature education

Introduction

Earth education is the “process of helping people live more harmoniously and joyously with the natural world” (Van Matre & Johnson, 1998, p. 1). Based on the belief that education is a key to enabling our societies to lessen their impact on the systems of life on our planet, earth education takes a holistic approach to education, with a clear focus on changing peoples’ individual and collective behaviors and actions. Earth education was designed to be an alternative to traditional environmental education, as will be explained in this article. The article begins with an explanation of how earth education was developed and the organization that was created to do that work. The next section provides a description of the programmatic approach used in earth education and looks at the key components of the earth education approach. Four earth education programs have been published; they are summarized, along with a description of the long-range plans for programs for all ages. Research conducted on earth education programs follows. Finally, the conclusion looks at new developments and what the future holds.

Background

Steve Van Matre is the founder of earth education and Chair of the international non-profit organization the Institute for Earth Education. Van Matre grew up in Indiana, United States, in a small city that afforded him easy access to natural places. He developed a love for nature at an early age. While he was a university student studying American history, the Towering Pines summer camp, in the north woods of Wisconsin, hired him to run their nature study program. The foundation for earth education was laid during his summers in that position.

Frustrated by the lack of personal connection to nature that he so frequently saw in the campers he encountered in the late 1960s and early 1970s, Van Matre created the Acclimatization program to help the young people develop a love affair with nature. A major focus of Acclimatization was on developing sensory awareness, breaking down the barriers to connections with the natural world that people in our societies too often have in place. In addition, Acclimatization focused on key ecological concepts and behaviors. The program was revolutionary in nature education, which until then had focused on identification and classification. The unique aspect of Acclimatization was what Van Matre and colleagues call “magic,” an intangible atmosphere that permeates the entire experience. Van Matre wrote two books, *Acclimatization* (Van Matre, 1972) and *Acclimatizing* (Van Matre, 1974), published by the American Camping Association. *National Geographic* magazine published an article on the camp and Acclimatization in the April 1974 issue.

The ideas of Acclimatization attracted a great deal of interest among educators, curriculum developers, naturalists, camp directors, and many others. In 1976, Van Matre and his colleagues formed a non-profit organization, Acclimatization Experiences Institute (AEI). Van Matre began conducting numerous workshops for outdoor leaders, camp personnel, and the U.S. National Park Service, across the United States and Canada. He also left Towering Pines and became a professor of environmental education and interpretation at George Williams College in Chicago.

With the development of environmental education in the 1970s, interest in applying Acclimatization ideas to education led to the development of the first complete program, Sunship Earth (Van Matre, 1979). Piloted in outdoor schools in Oregon, Sunship Earth is a five-day residential program that helps upper elementary students learn to be better passengers and crew members of our “Sunship”—our planet, which is like a spaceship powered by sunlight energy. The main components of the program are ecological understandings, feelings, and behavior change. Of course, magic is also essential.

In the early 1980s, Sunship Earth began to be offered by environmental centers in several places in the United States, Canada, and the United Kingdom. AEI supported their work through training workshops and by supplying some of the program materials. AEI did not receive any financial support from government agencies or private foundations; all income came from the sale of books and program materials, as well as workshop fees and small individual donations. Centers wanting to offer Sunship Earth bought a program

package from AEI that included materials required for the program as well as permission to use the name and offer the program.

Interest in Acclimatization continued to grow in the 1980s. Van Matre began doing an annual international tour to introduce his work in many other parts of the world. Several dozen people from across the United States and Canada, and from several other countries, who were interested in helping the work develop further became associate members of AEI. Work began on ideas for additional education programs to span the human lifespan.

In 1984, Acclimatization became earth education. The change was made to reflect the development of education beyond summer camp programs and to contrast the work with environmental education, which, in the view of Van Matre and his colleagues, had strayed from its initial purpose. The AEI changed its name to the Institute for Earth Education (IEE).

Over the next three decades, work continued on the development of new earth education programs. Interpretive design and contemplation are recent additions to the work of the IEE. At the time of writing (2020), Van Matre still leads workshops and gives speeches across the world. The IEE is an international organization with headquarters in Cedar Cove in the southeast of West Virginia. For further information, see the IEE's website.

Programmatic Approach

An important contribution of earth education to the field of environmental learning is the emphasis on a programmatic approach. Beginning in the 1970s, much of environmental education took an infusion approach, which, rather than creating new programs or classes, infused environmental messages and activities into existing curriculum and subjects. Dozens of activity guides were produced to provide a wide range of activities that teachers and outdoor leaders could pick from to insert as they saw fit. Van Matre was vocal in pointing out the futility of that piecemeal approach, noting that we would never adopt such a strategy with anything we thought was vitally important.

In contrast, the programmatic approach of earth education values holistic and coherent educational experiences with clear outcomes in mind and organized strategies to accomplish them. The Institute of Earth Education (IEE) describes a program as a series of carefully crafted, focused, sequential, cumulative learning experiences designed with specific outcomes in mind (Van Matre, 1990). The approach is based on the idea that we are ultimately striving to change the ways we live our lives so as to reduce environmental impact and increase positive connections with the natural world. In order to achieve that, a systematic approach is needed, one that includes ecological understanding, feelings, and processing.

Components of Earth Education Programs

There are three major components of all earth education programs: building understandings of key ecological concepts, developing feelings of connection to the natural world, and processing the experiences to apply them to participants' lives. In addition, magic is a fundamental ingredient in all earth education programs.

Understandings

Helping people develop understandings of important ecological concepts is an integral part of all earth education programs. The focus is on the big picture ideas rather than on the details or on numbers or facts. Identification (naming and labeling) is avoided. The Big Four ecological concepts are: (1) flow of energy, (2) cycling of materials, (3) interrelationships, and (4) change over time. These four were selected because they are fundamental concepts that help people understand how the systems of life work and provide a basis for understanding environmental problems and issues.

The I-A-A (Inform-Assimilate-Apply) learning model is used in earth education programs. "Inform" is for taking something in, whether through observation, reading, or listening. "Assimilate" refers to doing something with that information, in order to make it fit with other experiences and prior learning. "Apply" means to use it. Essentially, this learning model is a reaction to what too often happens in education: learners taking in a great deal of information without doing much with it and rarely actually using it. For real learning to happen, these three stages are all essential.

The Big Four concepts are very abstract. Energy flowing cannot be observed, matter cycling can be only partially glimpsed, interrelationships can be difficult to see, and change is often difficult to grasp, particularly long term change. Bringing these abstract concepts into the concrete for learners is a hallmark of earth education programs. Physical representations, analogies, and active learning all contribute to this effort. For example, to bring the abstract concept of photosynthesis into the concrete in Sunship Earth, learners crawl into a giant leaf and become workers in the Food Factory, handling the ingredients of water and air and using sunlight energy to produce food for all life.

Feelings

The Acclimatization work clearly demonstrated that developing feelings of affinity to and care for the natural world takes careful planning. Simply taking people to a nice natural area is not enough. Earth education programs have specific activities to help people develop feelings.

For example, in the Earthkeepers program (Van Matre & Johnson, 1988), there are four activities that focus on feelings. Earthwalk emphasizes observation as an alternative to a traditional nature walk. Discovery is the aim of the E. M.'s Diary activity. Magic Spots

provide learners with solitude experiences in the natural world, developing nonverbal skills. Finally, immersion is the goal of Seasons.

Processing

For experiences to be truly powerful and long-lasting, learners must process what those experiences mean for them in their daily life. Too often in educational experiences outside the classroom, little thought is given to this important part of learning. “Follow-up” activities that the teacher may or may not do with students is frequently all there is. Earth education programs include a “follow-through” component that is an integral part of the program. For instance, in Earthkeepers there are four “KEYS” to becoming an Earthkeeper. K (knowledge) and E (experience) activities take place away from school at the Earthkeepers Training Center during three days that form the initial, springboard experience. The “follow-through” part of the program consists of Y (yourself), which focuses on lessening personal impact and deepening feelings at home and school, and S (sharing), which focuses on helping family, friends, and younger children.

Processing learning as it is taking place is also important. In Sunship III (Van Matre & Johnson, 1998), young adolescents work in small “sharing circle” groups throughout the program to talk with each other about what they are experiencing, what they think about it all, and how it relates to their lives at home and school. The sharing circles meet initially before beginning the program and then two or three times each day during the three-day springboard experience. They continue weekly back at school during the remainder of the school year as the participants help each other with the “follow-through” part of the program, the Quest, seeking truth, adventure, and harmony.

Magic

Magic is just as vital a part of earth education as it was in Acclimatization. A hallmark of earth education is the way this elusive element is subtly woven throughout the experiences. Earth education programs are designed to be “magical learning adventures” for participants. Secrets revealed along the way, a sense of discovery, active participation, storylines, and well-crafted activity materials all contribute to this. Each program is designed with one or more “hookers,” experiences created to entice the learners, to pull them rather than push them into full participation. In Rangers of the Earth (Van Matre & Farber, 2005), notes from “Rangers” along with a riddle to solve contribute to this sense. In Earthkeepers, the mysterious character E. M. invites the learners to become Earthkeepers.

Equally important are “organizers” that help learners hold onto what they learn and use it later. Mnemonic devices, such as KEYS for Earthkeepers, help them keep track of the program while also helping to build the sense of magic; for each of the four parts of the program, each participant earns a key that opens a locked box to revel one of the secret meanings of “E. M.,” the initials of the mysterious character.

There are other important elements that also enable the sense of magic and adventure to permeate the programs. Two of the most important are: the care with which the learners interact with participants and the natural world, and the way the activities flow from one to the next to form a coherent whole rather than being a series of unrelated activities.

Earth Education Programs

Long-Range Plan

The IEE has set a goal of developing model programs for the entire human lifespan. Some of the programs have been published and are being offered, sometimes in many different countries around the world. As of 2020, others have had extensive development but are not yet published, while some are still in the raw idea stage.

Earthborn (ages 0–3) is only in the idea stage. Earthlings (ages 3–5) is partially developed and has had some very limited piloting. Nature's Family (ages 6–8) is also partially developed but has not yet been piloted. Lost Treasures (ages 8–9) is fully developed and has had limited piloting. Earthkeepers and Rangers of the Earth (ages 10–11) are published, as are Sunship Earth (ages 10–12) and Sunship III (ages 13–14). Earthways (ages 16–19) is partially developed but has not yet been piloted. Earthbound (adults) is partially developed and some components have been piloted. Brief descriptions of the four published programs follow.

Sunship Earth

The original earth education program, Sunship Earth (1979) is a five-day program that teaches seven core ecological concepts (energy flow, cycling, diversity, community, interrelationships, change, and adaptations) along with developing feelings of care for the natural world. Learners leave at the end of the experience with personal commitments to break environmental bad habits and form new, positive habits. Highlights of Sunship Earth include "concept paths" on which learners engage in a series of highly engaging activities, and a story line of the concepts as secrets of life that young people discover and share with others.

Earthkeepers

The most widely offered earth education program, Earthkeepers (1988) includes the Big Four concepts taught in outdoor, participatory activities, the four feelings activities, and the follow-through component described in the "Components of Earth Education Programs" section. Highlights of Earthkeepers include a clear and compelling story line for the entire program, the excitement of earning keys and unlocking secrets, the mystery of E. M., and the direct connections of the concepts and experiences to life at home and school.

Rangers of the Earth

Using the same activities as Earthkeepers, Rangers of the Earth (2005) has a different organizing story and a different structure. Rather than beginning with a three-day springboard experience followed by program completion at home and school, Rangers consists of five phases: a one-day experience away from school, work back at school and at home, another day away from school, more work at home and school, and a closing synthesis. A highlight of Rangers is the way the learning and application are iterative.

Sunship III

Sunship III (1998) is designed for young adolescents who are at a key stage of life, preparing to become adults and taking on more and more personal responsibility and freedom to make personal choices. The Big Four concepts are a key part of the program, but, while still fully participatory, the activities explore the concepts in more sophisticated ways and explicitly apply them to our daily lives. Highlights of Sunship III are the sharing circles described in the "PROCESSING" section, the direct and honest appeal to the participants to engage in the "magic" of the program, and the community involvement aspects of the Quest.

Research on Earth Education

Research on earth education programs (Earthkeepers, Sunship Earth, and Sunship III) has often examined the impact on students' cognitive (knowledge), affective (feelings), and conative (action) domains. The cognitive domain refers to students' understanding of key ecological concepts taught through the programs, while the affective has been operationally defined as the overarching umbrella of environmental perceptions (developing positive feelings for the natural world). The conative domain addresses positive environmental action, which is often indicative of general environmental behavior. While research on earth education programs has been quite extensive in many countries around the world, earlier studies were often compromised by a lack of sound methodological practices (Martin, 2003). As a result, the majority of these studies found some or no impact on students and a poor relation among the cognitive, affective, and conative domains.

Early research on earth education programs has consistently shown gains in student understandings of ecological concepts (e.g., Bires, Johnson, & McFaddden, 1982; Cancilla, 1983; Farnbank, 1993; Keen, 1991; Martin, 2002; Park, 1997; Turner, 2001; Van Wissen, 1992). However, for perceptions, the results have not been as conclusive (Martin, 2003). Changes toward pro-environmental perceptions, from pre- to post-program, were found in some studies (e.g., Bires et al., 1982; Black, 1998; Cancilla, 1983; Greenall-Gough, 1990; Park, 1997; Van Wissen, 1992). Other studies, however (e.g., Keen, 1991; Martin, 2002; Mulligan, 1989; Payne, 1981), found no statistically significant changes as a result of these programs. Reasons for the discrepancies could relate to the fact that many of these

studies were not peer reviewed and few used valid and reliable measurement instruments with good theoretical frameworks (Martin, 2003).

Assessing participants' behavioral change is another important component of evaluating earth education programs, though it can be the hardest domain to research (Black, 1998). Despite its importance, most studies have failed to examine participants' environmentally benign behavior, while those that did relied primarily on self-reported behavior through interviews or participant observations through a third party (teachers, parents, or both). Despite the difficulties, a small number of studies found some evidence that earth education programs could have a positive impact on participants' environmental behavior after program completion (Black, 1998; Bosse, 2000; Martin, 2002; Mess, 2000; Rowbotham, 1983).

Since the late 1990s, however, a series of well-developed studies have found substantial and consistent evidence of the impact of earth education programs, and this evidence has been published in peer-reviewed journals. In contrast with earlier studies, these studies used valid and reliable measurement instruments with good theoretical frameworks, such as the Two Major Environmental Values (2-MEV) model (Bogner & Wilhelm, 1996; Bogner & Wiseman, 2002, 2006) and the New Ecological Paradigm (NEP) scale (Dunlap, Van Liere, Mertig, & Jones, 2000). The employment of more sound methodological practices provided more successful measures of the impact of earth education on the three domains and shed more light on their relationship to each other.

Examining a number of the studies carried out during the 21st century, it is evident that earth education programs demonstrated consistent statistically significant impact on students' conceptual understandings (Činčera & Johnson, 2013), environmental perceptions (Činčera & Johnson, 2013; Johnson & Manoli, 2008, 2011; Manoli, Johnson, & Dunlap, 2007; Manoli et al., 2014), and behavior (Johnson & Činčera, 2015; Manoli et al. 2014). In addition, when examining the relationships between environmental perceptions and positive environmental behaviors, it is evident that there is a strong correlation between the two domains (Johnson & Činčera, 2015; Manoli et al., 2014).

During an evaluation study of Earthkeepers when it was implemented in the Czech Republic for the first time, Činčera and Johnson (2013) found that the process was very challenging and demanding for the staff of the center; however, it was very rewarding as well. Students and teachers, meanwhile, expressed a high level of program satisfaction and reported long-lasting effects on school performance. Finally, students' ecological knowledge and attitudes were positively impacted by the program. A second international study, by Manoli et al. (2014), also examined the impact of the Earthkeepers program on children's ecological understandings, environmental values, and behavior. Similarly, the analysis showed gains in students' understanding as well as significant changes toward more pro-environmental values and behavior. Interviews with students confirmed the quantitative results and verified students' behavior. Behavioral changes were also found by Johnson and Činčera (2015). The study explored the relationship between attitudes and behavior among Earthkeepers participants before and after the program. The re-

searchers concluded that students with greater attitudinal changes, as a result of the program, enacted more positive environmental behaviors. Some of these behavioral changes continued one year later.

Since environmental perceptions are closely correlated with environmental behavior, and if the purpose of environmental learning is to help develop environmentally literate citizens, it is crucial for educational programs to address these perceptions. In their study, Johnson and Manoli (2008) examined the effects of the Sunship Earth program on environmental perceptions of fifth and sixth grade students in the United States. They compared children who had participated in the program with a control group who had not, and their results showed a statistically significant change toward more pro-environmental perceptions in the Sunship Earth participants; the control group exhibited no such change. In addition, perceptions were stable over time for a smaller sample of students. Similar results were found in a second study by Johnson and Manoli (2011). During a four-year-long study, they found statistically significant changes in environmental attitudes of program participants, but not for a control group. The Earthkeepers program was also used to address changes in environmental worldviews. Using the NEP scale for children, Manoli et al. (2007) found statistically significant changes in students' environmental worldviews.

Not all research on earth education programs has focused on the cognitive, affective, and conative domains, however. For example, Felix and Johnson (2013) investigated the follow-through by Earthkeepers teachers. Using interviews with teachers and document analysis as well as student outcome data, they described key characteristics and elements that enable teachers to build on the follow-through component of Earthkeepers in meaningful ways and to show how that influenced their students.

New research on earth education programs is focusing on, among other things, the relationships between the cognitive, affective, and conative domains. Recent theoretical models such as the Competence Model for Environmental Education (Roczen, Kaiser, Bogner, & Wilson, 2013) are providing new frameworks for examining the experience of learners in these programs.

Conclusion

Earth education has been in existence since 1984, with another 15 years of Acclimatization before that. What is the future of earth education? The Institute for Earth Education (IEE) has identified three related but distinct pillars for the future: education, interpretive design, and contemplation. With the education pillar already described, here we briefly explain interpretive design and contemplation.

Interpretive Design

Beginning with his work for the National Park Service in the 1970s, Van Matre has worked on alternative approaches to interpretation. This work has led to the framing of "interpretive design" as a new way of creating experiences for the public. The book *Interpretive Design and the Dance of Experience* (Van Matre, 2009) defines interpretive design as the craft of enriching the experience of leisure visitors with places established for the public good. Van Matre has led interpretive design workshops in several countries in recent years. Interpretive design has become the second of three pillars for the IEE.

Contemplation

The IEE's third pillar is contemplation. Based on activities in both Acclimatization and earth education that helped people take time to consider their relationship with the natural world, recent work has focused on designing contemplative experiences for adults. Van Matre conducts workshops on contemplation in which he engages participants in activities that will likely become part of larger contemplative experiences for the IEE.

Future

As a small, international, non-profit organization with no government or foundation support, the IEE has always lived close to the edge. Its success is due to the energy and commitment exhibited by Van Matre along with a small group of dedicated volunteers. For the organization to continue, a new generation of earth education leaders is needed. While many new people are continually attracted to the work, it will take time for those interested in the organization itself to develop and assume leadership roles. Regardless of what the future of the IEE will be, earth education as a programmatic approach to environmental learning will continue to have an impact as an alternative model and through its innovative programs. If environmental learning is taken up as a serious response to the many environmental crises we face now and in the future, earth education will be ready to contribute.

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