THE ENGINEERING AND STRUCTURE OF ENVIRONMENTAL ADULT EDUCATION

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ABSTRACT

Environmental Education (EE) is a process in which individuals gain awareness of their environment and acquire knowledge, skills, values, experiences, and also the determination, which will enable them to act - individually and collectively - to solve present and future environmental problems.

EE is a complex process, covering not just events, but a strong underlying approach to society building as a whole. EE provides people with the awareness needed to build partnerships, understand NGO activities, develop participatory approaches to urban planning, and ensure future markets for eco-business (UNESCO, Tbilisi Declaration, 1978, in environmental education [1]). In conjunction with this issue comes Environmental adult education which brings an ecological perspective to studies of adult learning by concretizing the interconnections between people's experiences of environmental deterioration and recognition of the destructive powers of the global economy. Environmental adult education for community sustainability situates local knowledge within a global pedagogy and activism of survival [2]. This paper discusses the following issues: adult learning theory, the concept, structures and engineering of environmental education, the benefits of environmental learning.

Key words: environmental education, adult education, adult learning.

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1. ADULT LEARNING THEORY:

Learning can be defined formally as the act, process, or experience of gaining knowledge or skills. In contrast, memory can define the capacity of storing, retrieving, and acting on that knowledge. Learning helps us move from novices to experts and allows us to gain new knowledge and abilities [3].
She continued that, Learning strengthens the brain by building new pathways and increasing connections that we can rely on when we want to learn more. Definitions that are more complex add words such as comprehension and mastery through experience or study.

Physiologically, learning is the formation of cell assemblies and phase sequences. Children learn by building these assemblies and sequences. Adults spend more time making new arrangements than forming new sequences. Our experience and background allow us to learn new concepts.

Conner, 2007[3], said that at the neurological level, any established knowledge (from experience and background) appears to be made up of exceedingly intricate arrangements of cell materials, electrical charges, and chemical elements. Learning requires energy; re-learning and un-learning requires even more. We must access higher brain functions to generate the much-needed energy and unbind the old.

Our discussion here assumes learning, from the most fundamental to complex, to be any increase in knowledge, memorizing information, acquiring knowledge for practical use, abstracting meaning from what we do, and a process that allows us to understand.

Remarkably, people can learn from the moment of birth. Learning can and should be a lifelong process. Learning shouldn't be defined by what happened early in life, only at school. We constantly make sense of our experiences and consistently search for meaning. In essence, we continue to learn.

Though humans like the familiar and are often uncomfortable with change, the brain searches for and responds to novelty. "Ah-ha!" you may think. "That's why I hated freshman English. No novelty!"

Rote learning frustrates us because the brain resists meaningless stimuli. When we invoke the brain's natural capacity to integrate information, however, we can assimilate boundless amounts.

Conner, 2007, added, Another "Ah-ha!"? This may explain why sometimes a tough class, one you never thought you would get through, was one of your all-time favorites.

Western society once believed adults didn't learn. Even today, if you ask a group why adults cannot learn, it may surprise you how many begin answering the question without challenging the premise. Unfortunately, many adults deny themselves what should be one of the most enriching parts of life because they assume they can't learn.

We can learn from everything the mind perceives (at any age). Our brains build and strengthen neural pathways no matter where we are, no matter what the subject or the context. In today's business environment, finding better ways to learn will propel organizations forward. Strong minds fuel strong organizations. We must capitalize on our natural styles and then build systems to satisfy needs. Only through an individual learning process can we re-create our environments and ourselves[3].

Speck (1996) notes that the following important points of adult learning theory should be considered when professional development activities are designed for educators:

- "Adults will commit to learning when the goals and objectives are considered realistic and important to them. Application in the 'real world' is important and relevant to the adult learner's personal and professional needs.
- Adults want to be the origin of their own learning and will resist learning activities they believe are an attack on their competence. Thus, professional development
needs to give participants some control over the what, who, how, why, when, and where of their learning.

- Adult learners need to see that the professional development learning and their day-to-day activities are related and relevant.
- Adult learners need direct, concrete experiences in which they apply the learning in real work.
- Adult learning has ego involved. Professional development must be structured to provide support from peers and to reduce the fear of judgment during learning.
- Adults need to receive feedback on how they are doing and the results of their efforts. Opportunities must be built into professional development activities that allow the learner to practice the learning and receive structured, helpful feedback.
- Adults need to participate in small-group activities during the learning to move them beyond understanding to application, analysis, synthesis, and evaluation. Small-group activities provide an opportunity to share, reflect, and generalize their learning experiences.
- Adult learners come to learning with a wide range of previous experiences, knowledge, self-direction, interests, and competencies. This diversity must be accommodated in the professional development planning.
- Transfer of learning for adults is not automatic and must be facilitated. Coaching and other kinds of follow-up support are needed to help adult learners transfer learning into daily practice so that it is sustained." (pp. 36-37)[4].

2. PREVIOUS STUDIES

Chawla and Louis study, 2007[5]
This article reviews four bodies of research that shed light on how to promote active care for the environment in children and youth: research on sources of proenvironmental behavior, socialization for democratic skills and values, the development of a personal sense of competence, and the development of collective competence. The article begins with an overview of studies of formative childhood experiences reported by environmental activists and educators, followed by correlational and experimental studies with young people regarding factors associated with their taking action for the environment. Because behaviors with the largest potential benefits for the environment require political engagement, the article also reviews experiences associated with young people’s interest and engagement in public issues. Action for the environment in the home or in public arena like schools and communities requires a personal sense of competence and a sense of collective competence, or confidence in one’s ability to achieve goals by working with a group. Therefore experiences that promote the development of these assets are summarized as well. The conclusion compares major findings in these different fields and discusses implications for environmental educators.

Walter study, 2009[6]
This article offers a typology of philosophical traditions in environmental education for adults, based on five philosophical perspectives of adult education described by Elias and Merriam. These five traditions are liberal, progressive, behaviorist, humanist, and radical adult environmental education, respectively. A summary of each philosophy’s main tenets, including the aims of education, beliefs about the nature of learners, the role of educators, and instructional strategies and assessment of learning is given in the article. Limitations of the
typology are also discussed. Prominent examples from the environmental movement and adult environmental education practice in North America are then presented to illustrate each philosophy. The article ends with a discussion of directions for future research and implications for practice.

Rinfret study, 2010[7]
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3. THE CONCEPT OF ENVIRONMENTAL ADULT EDUCATION:
The aim of environmental adult literacy is to challenge scientific knowledge as the fundamental structure of learning, and to revalue people's experiential knowledge. A transformative ecological understanding of lifelong learning reconnects humans with nature and fosters social dialogue and action [2]. Environmental education is a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978, in environmental education)[8].

Environmental adult education enhances critical thinking, problem-solving, and effective decision-making skills, and teaches individuals to weigh various sides of an environmental issue to make informed and responsible decisions. Environmental education does not advocate a particular viewpoint or course of action.

The components of environmental education are:

- Awareness and sensitivity to the environment and environmental challenges
- Knowledge and understanding of the environment and environmental challenges
- Attitudes of concern for the environment and motivation to improve or maintain environmental quality
- Skills to identify and help resolve environmental challenges
- Participation in activities that lead to the resolution of environmental challenges

Environmental adult education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp, 1969, in environmental education)[9]. Kansas association for conservation and environmental education discussed the concept of environmental education they stated that Environmental education may best be defined as a process directed at creating awareness and understanding about environmental issues that leads to responsible individual and group actions. Successful environmental education focuses on processes that promote critical thinking, problem solving, and effective decision-making skills. Environmental education utilizes processes that involve students in observing, measuring, classifying, experimenting, and other data gathering
techniques. These processes assist students in discussing, inferring, predicting, and interpreting data about environmental issues.

**Environmental education is not environmental information**

Environmental information is providing facts about specific environmental issues or problems. This may be accomplished through news releases, informational brochures, bulletins, videos, or other media techniques. It is often geared toward the general public instead of targeting a specific group or audience. Information can be very useful to the highly motivated individual who is concerned about a specific topic or issue and can be a critical element of environmental education.

**Environmental education is not environmental advocacy**

Quality environmental education concentrates on the educational process. It is non-biased and science-based. Environmental educators may consider themselves environmental advocates in their personal lives. However, in their role as environmental educator they must remain neutral; there is no room for personal beliefs to take center stage. It is important for environmental educators to remember which role they are in when working with an audience.

Environmental problems and issues are complex and there are not simple answers. Often there are many possible solutions or no obvious solution at all. It is through the processes of quality environmental education that students can sort through the frequently biased, emotional, and propagandized elements of environmental issues, weighing various sides of an issue in order to make informed, balanced, and responsible decisions [10].

4. The benefits of adult environmental education

In a world where it is increasingly challenging to get students interested in classroom lessons, EE offers an enriching way for both adult learners and teachers to connect their appreciation of the natural world to academics. Environment-based education emphasizes specific critical thinking skills central to “good science”—questioning, investigating, forming hypotheses, interpreting data, analyzing, developing conclusions, and solving problems (National environmental education foundation, 2015). The national environmental education foundation provided more benefits of environmental education as follows: Environmental education emphasizes cooperative learning (i.e., working in teams or with partners), critical thinking and discussion, hands-on activities, and a focus on action strategies with real-world applications. As a result, students who study EE develop and practice the following leadership skills:

- Working in teams
- Listening to and accepting diverse opinions
- Solving real-world problems
- Taking the long-term view
- Promoting actions that serve the larger good
- Connecting with the community
- Making a difference in the world.

Sometimes traditional instruction, such as lecturing, is the most practical approach to covering broad content. But when adult learners learn through a problem- or project-based approach—a key strategy in environment-based education—they gain a better understanding of what they learn, they retain it longer, and they take charge of their own learning—key skills for success in our data-driven, rapidly changing world.

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A case in point: the experience of a student who moved from a traditional school to one focused on EE. “I’ve learned a lot more [here] than I ever did at my old school,” he said. “There, they spoon-fed you. Here, they leave [learning] up to you, and that makes it easier to learn, and to want to learn more. Adults can be uninterested in learning —especially if they think that what they’re learning is not relevant to their everyday lives. But tap into their interests—for example, as environmental education does, with its emphasis on the living world and hands-on activities—and learners suddenly get excited [11].

5. CONCLUSION

Institutions that adopt environmental education as the central focus of their academic programs frequently demonstrate the following results:

- Reading, science, social studies, and mathematics scores improve.
- Learners develop the ability to transfer their knowledge from familiar to unfamiliar contexts.
- Learners “learn to do science” rather than “just learn about science.”
- Classroom discipline problems decline.
- All learners have the opportunity to learn at a higher level.

Environmental educators often find that learners who fail in traditional school settings can succeed when the natural outdoor environment becomes the learners’ classroom. For example, learners who learn best by doing can be as successful as learners who learn best through lectures and books [11].

REFERENCES:

[1] Environmental education, gdrc.org