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AUTHOR Horton, Robert L.; Hanes, Susan
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ABSTRACT

This bulletin discusses the aspects of curriculum development that relate to environmental education. The first of five sections establishes the need for curriculum development that addresses the emotional, cultural, and sociological factors that influence the curriculum framework in view of the need for educational reform. The second section examines the necessary framework to establish these components within environmental curricula. The third sections presents three curriculum paradigms: Positivism, Phenomenological/Interpretive, and Critical. The strengths and weaknesses of each paradigm are discussed. The fourth section discusses epistemology in environmental curricula. Having established a foundation on what knowledge is or is not, the fifth section discusses the use of metaphor as a link to experiential methods of learning. The document concludes that environmental education is an interdisciplinary process that needs a holistic approach taking into account the individual's values, culture, goals, abilities, and a subjective evaluation of the external situation. (Contains 13 references.) (MDH)

The Environmental Outlook

An informational bulletin from ERIC/CSMEE

Philosophical Considerations for Curriculum Development in Environmental Education

by: Robert L. Horton & Susan Hanes

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What is the purpose of environmental education? Is it to move into new meadows of knowledge, to challenge existing paradigms, and to rock foundations? Or, is it to encourage low risk taking, an obedience to authority, to acquire rote facts, to be subjected to failure, and to acquire appropriate marks?

Curriculum developers, decision makers, and educators must first address these questions if knowledge acquisition is to move to understanding and become the primary objective. The purpose of environmental education must be viewed with respect to individuality, culture, personal history, and the intrinsic motivators as one moves towards higher levels of cognition. It is in these ways that environmental education can fulfill its stated goals and objectives.

The Need For Reform

There is a sense of urgency in the words of reform written three decades ago, reflecting the cry for reform from within our educational system. Much of the disillusionment with education today, and specifically with schools, is the result of academic climates that are impersonal and unrelated to student interests, experiences, and needs. The basic philosophy and methods of traditional education lead to the alienation of children from themselves, alienation from peers and from teachers, and alienation from society.

According to Sergiovanni (1990), a certain disconnectedness and defensiveness characterize the system. The author states that roughly three quarters of a million students who graduate from our high schools are functionally illiterate. Another three quarters of a million students drop out. Among Blacks and Hispanics the dropout rate hovers around 50 percent. The questions that beg answered are, why have almost thirty years passed without significant curriculum reform? What and how should children be taught? Why is the dropout rate increasing? Why is there so much violence in schools? How do we guide children of different cultures into our educational system?

A review of educational literature shows that these are not new queries. Depending upon the climate of the times, pedagogy has tried to address these questions. During the industrial revolution, for example, paradigms reflecting a mechanistic view were applied to educational systems. Efficiency was the key word with the children viewed as raw material to be molded and shaped to adequately fill the needs of an industrialized society. Immigrants were to be "Americanized" to function as cogs in the great industrial machine.

Change is needed to successfully sustain civilization in the 21st century. Yet, the change needs to come perhaps by viewing the comprising parts rather than society as a whole. Individuality, changing norms, and respect for the individual's personal and collective cultures must be considered. Knowledge acquisition must consider the individual's personal reality in relation to the world in which he/she functions. Acquisition of knowledge and the implications for educational reform need to be considered before reform can successfully begin. By looking at the emotional, cultural, and sociological factors that influence the curriculum framework, insight can be gained into individual understanding.

Necessary Considerations For Environmental Curricula

Many schools of thought exist in regard to curriculum development. When developing a curriculum, attention must be given as to the developer's philosophical stance and the curriculum paradigms that are embraced. Schubert (1986)

suggests "Perspectives form the context or background that nourishes the development of a set of beliefs or assumptions." According to the author, philosophy lies at the heart of every curriculum endeavor.

Assuming each developer, educator or teacher functions from a philosophical base, bringing into the developing curriculum, beliefs and ideas based upon a sense of values, expectations, and purpose, it seems appropriate to understand the philosophical framework and intent of the individual. For example, the beliefs one holds about people, the world, and one's self, lead to the development of one's personal perspective about curriculum.

One's philosophical views help to establish the important components within the curriculum. These views are best expressed by taking an eclectic or integrated approach, drawing from Naturalism, Pragmatism, Existentialism, and Phenomenology. Briefly, Naturalism advocates individual development, by not imposing social conformity, and encourages close contact with nature. From the Pragmatist school of thought comes the idea that knowledge can be created through reconstruction of experiences.

The philosophy of Existentialism and Phenomenology is tempered so as not to become contradictory with the Naturalist view. The belief held here is that the world is alienating and the way to deal with existence is to take responsibility for one's life. It then becomes necessary to understand and deal with events in a individual's life from their historical perspective. The goal should be to help the individual realize choice is a key element in developing a life of personal growth. Lifelong learning is also a possibility when choices are realized. To see alternatives, understanding must be gained in regard to self and others. The more information an individual possesses, the greater the number of choices possible.

Paradigms For Curriculum Development

Once a philosophical foundation is established, what follows is the development of a curriculum based upon one of three curriculum paradigms: Positivism, Phenomenological/Interpretive, and Critical. Each of these paradigms is related to a philosophical stance that questions what knowledge is and how it is acquired.

Positivism

The objective of Positivism is to explain, predict, and control. The evaluative methods are based upon "scientific" method with the premise that social sciences and natural sciences are governed by a set of universal laws that recognizes positive facts and observable "objective" phenomena. Researchers are objective observers of events in which relationships are discovered that have always been there. This paradigm is based upon the premise that there is an objective reality that can be fragmented, compartmentalized, and once understood, predicted and controlled.

Knowledge is also viewed as value free and objective. A dualism exists in this respect between the knower and the known. Based upon the objectivity of this premise, political, economic, and societal implications of inquiry are not considered. Lincoln and Guba (1985) summarize this view by listing five assumptions of Positivism.

1. An ontological assumption of a single, tangible reality "out there" that can be broken apart into pieces capable of being studied independently; the whole is simply the sum of the parts.
2. An epistemological assumption about the possibility of separation of the observer from the observed or the knower from the known.
3. An assumption of the temporal and contextual independence of observations, so that what is true at one time and place may under appropriate circumstances also be true at another time and place.
4. An assumption of linear causality; there are no effects without causes and no causes without effects.
5. An axiological assumption of value freedom, that is, that methodology guarantees that results of an inquiry are essentially free from the influence of any value system.

The strengths of the Positivist paradigm are considered in relation to the intent. This perspective is summed as classification, with the intent of prediction and control. No action for societal or political change is implemented. The knowledge gained through this paradigm is a foundation for fields such as biology, zoology, chemistry, and social sciences where classification is the purpose.

The weakness of the Positivist paradigm is that it reduces the complexity of humans. It fragments and compartmentalizes humans and the natural world, and the assumption is made that knowledge is value free. Objectivity is relied upon rather than considering processes such as intuition and insight. Tacit knowledge is disregarded. The stance of objectivity disregards the value system of the researcher/practitioner. In this regard many of the moral, ethical, political, and economic implications are not considered.

Phenomenological/Interpretive

Mental and psychological acts such as thinking, feeling, and perceiving are used to describe and understand human experiences. The experience itself must be studied and the underlying assumption of the phenomenologist is "...that human experiences can be catalogued and described in order to learn how we get meaning from our experiences" (Eichelberger, 1989).

The context, along with one's individual's frame of reference, are taken into consideration. From this perspective, the focus is not on discovering universal laws but on interpreting and understanding experiences. The Phenomenological/Interpretive paradigm functions from the epistemological stance of hermeneutics. Hermeneutics looks at individual and group interpretations of reality within specific content to historical, societal, and cultural factors.

Eichelberger (1989) addressed what is referred to as "bracketing" in which those involved in research attempt to be objective by acknowledging and suspending their own subjectivity and becoming a disinterested observer. Features of the phenomenon are studied in comparison to other experiences. Reality in this paradigm is viewed as constructed, multiple, and holistic. According to Lincoln and Guba (1985), a constructed reality holds an infinite number of constructions that might be made and hence there are multiple realities. Inquiry is grounded in a holistic, divergent, constructed reality. Knowledge acquisition and the political and economical implications of values are acknowledged. These characteristics are seen as strengths within the paradigm.

The weakness of the Phenomenological/Interpretive paradigm is seen in the role of the researcher and practitioner in regard to subjectivity. Although researchers and practitioners "bracket" their personal value theories in an attempt to be objective, the objectivity becomes questionable.

Critical

The premise of the Critical paradigm is advocacy. The purpose is to emancipate people from personal and societal ideologies through their own understanding and actions. In this way, the political and economic implications of value and knowledge acquisition are recognized. If the goal of the Phenomenological/Interpretive paradigm is to understand, and the goal of the Positivist paradigm is to predict and control, then the goal of the Critical paradigm is emancipatory in nature. Change is a key word with this paradigm. The ontological view is much like the Phenomenological/Interpretive paradigm. Reality is constructed, multiple, and holistic. The implication of the power of knowledge is recognized in this advocacy theory, with directiveness toward the oppressed. A premise is making the oppressed aware of situations, choices, and changes through knowledge acquisition.

Some of the strengths of the Critical paradigm are the acknowledgment of the impact of values, that knowledge is not neutral, and the educative process involves both the researcher, practitioner and the members of the group. The goal of emancipation is also seen as a strength. Both the Critical and Interpretive paradigms acknowledge the process of discovery which can include insight and intuition. The Critical paradigm moves away from a causal linear process. This openness to move past the sequential ordering of steps and reliance on laws, gives precedence to a broader view of the society and the interconnections between humans and their particular reality.

As with the Phenomenological/Interpretive paradigm, the primary weakness of the Critical paradigm is the subjectivity of the researcher and practitioner. Also seen as a weakness is the acknowledgment and interaction of the researcher and practitioner bound by moral, political, and economic issues. With the purpose of implementing social change, the empowerment of the researcher could be negative. When trust is given, as in the establishment of the relationship to implement social change, vulnerability results. Vulnerable individuals could be swayed into accepting ideas that are not within their best interests.

Epistemology in Environmental Curricula

Having provided a philosophical position related to curriculum development, the next issue of importance is to define what knowledge is, or is not, from this perspective. Shubert (1986) states, "Epistemology is probably the branch of philosophy that most directly speaks to education." The author suggests six different ways of cognition including Authority, Revelation, Empiricism, Reason, Scientific Method, and Intuition.

To understand the acquisition of knowledge it is necessary to begin with a workable definition. Knowledge can be defined along a whole spectrum of theories from a stance reflecting the behaviorists stimulus response theories (Skinner, 1953) to the humanistic psychologists (Maslow, 1968 Rogers, 1951) or existentialists theories. According to Polanyi (1958), there are two kinds of human knowledge, Explicit Knowledge and Tacit Knowledge. Explicit knowledge relates what is set out in written words or maps, or mathematical formulae. Tacit knowledge relates to recognizing our experience so to gain intellectual control over it (Polanyi, 1958).

The understanding of words and symbols is also a tacit process and is related to our experiences: to view in different ways. According to Polanyi (1958), how we come to hold a piece of knowledge to be true is that we seek to clarify, verify or lend precision to something said or experienced. We move away from a position that is felt to be somewhat problematic to another position that we find more satisfying.

There is a difference between understanding and knowledge. Knowledge relates to aspects that are more concrete whereas understanding reflects a higher level of cognition and is more individualized. Our experience, in effect, is filtered through our own conceptual framework and affects the manner to which the experience is addressed based on previous knowledge, (Boulding, 1956). Hawkins (1985) defines a conceptual framework as the complex matrices of records in the memory, the cognitive maps that are used as references to assess and assimilate new information received through the senses, and systems of attributes and values that are modified continuously in response to external stimuli and internal reasoning.

Each individual's understanding may differ even though the knowledge is the same. Experiences and the conceptual framework are linked. The value of numerous experiences and openness to experience becomes obvious in the production of a broader conceptual framework. Because the framework is comprised of past experiences that are received through the senses and affected by cultural and emotional factors, the individual functions from a personal reality. Limitations may exist in understanding due to the conceptual framework limiting responses, choices, and processes used in problem solving.

Experimental Education and the Environmental Curricula

Having established a foundation on what knowledge is or is not, we can move to a discussion of experiential methods of learning. Priest (1986) states that experiential education requires use of the six senses including intuition. It also includes both cognitive and affective domains. Such an approach of active learning supports the experiential method, based upon the Critical paradigm.

From the work of DuShane (1980), other premises from the Critical paradigm are supported as well. The first assumption DuShane makes is that one of the purposes of education is to grow as a person and to acquire skills necessary to lead a fulfilling life. Education must incorporate a lifelong understanding of the interrelationships between humans and their environment. The internal state of the learner must be taken into account. Intrinsic motivation is seen as a trait to be fostered.

Metaphor

One method to address intrinsic motivation would be the utilization of metaphor in conjunction with experience. The use of metaphor relates to the Critical paradigm through the experiential method, preconscious experience, sources of literature, and new language forms. Sanders and Sanders (1984), elaborates on the use of metaphor as an educational medium. According to these authors, metaphoric education teaches individuals to link concepts and imagination; to express thoughts otherwise unexpressed. Furthermore, metaphoric thought provides an understanding of concepts not possible in the more passive activities of reading and writing.

Affective insight and utilization of both hemispheres is also an effect of metaphoric education. Concept formation becomes an interactive process when metaphor is used. The right hemisphere draws

upon life experiences to create concept understanding, while the left hemisphere uses analytic process, (Sanders and Sanders, 1984).

Another factor in substantiating the use of metaphor relates to the afore mentioned conceptual framework. The conceptual framework helps to form the foundation by which the individual decodes the metaphor. The value of metaphor relates to an individual's perception of reality. Each experience being decoded finds a common experience within the functioning framework to relate to through metaphor. The effectiveness of learning relates then to the uniqueness of the learner.

The link becomes the metaphor, allowing each individual to utilize their own perception of reality. By synthesizing the concepts presented in literature, the importance of external forces may be noted. The uniqueness of the learner in combination with the external forces that help comprise the environment, greatly influences how concepts are linked. External forces, according to Rogers (1951), include establishing an environment that is safe and non-threatening. Rogers also suggests that learning is threatening. If this concept is taken a step further we find the necessity of establishing a humanistic environment. Psychological safety, empathy, supportive, and non-evaluative are all terms used to describe a humanistic environment.

A method of considering knowledge acquisition with regard to one's conceptual framework, taking into account personal history and culture, is presented by Sanders and Sanders (1984) as it applies to education. Metaphoric experiential education is a starting point to implement change. In part, the central theme relates to the conceptual framework.

Through metaphoric experiential education, the student is moved to the abstract level of thinking. It is suggested that metaphoric education be combined with experiential education. By utilizing metaphor and experiential education, the learner can achieve the desired curriculum outcomes through discovery and comparison. Activities might include, for example, an afternoon field trip, backpacking, or establishment of a base camp. One can also incorporate direct utilization of the environment for a full range of studies, classroom presentation of ecosystems, a slide show at a state park, or a month long retreat in which all facets of the environment are used. All the examples can incorporate the use of metaphoric experiential education.

Priest (1986) views such educational programs as including a blend of both environmental and educational branches. Programs indicate a range of experiential or environmental education spanning the spectrum from integration of selected techniques in the classroom to a total curricular program built upon these theories.

Conclusion

People's attitudes toward the environment have gained much attention throughout the past few decades. Many believe that the solutions to our environmental problems lie in science and technology taking a positivistic approach to education, while others advocate responding to environmental problems using a holistic approach. This latter group of investigators look at the total relationship of mind, body, and spirit.

Technology, science, and humans, comprising mind, body, and spirit, cannot be separated. Examples of this notion are embodied in gaia theory, quantum theory, and are espoused by the journal of *Holistic Education*. These controversial theories have found their way into education systems, appearing as a new praxis. Traditional methods of teaching science are being challenged as hands-on, discovery learning and interdisciplinary methods, within a holistic context, are being debated and brought forth for consideration.

In this regard, environmental education is seen not as a separate discipline, but as a process applicable to learning environments. Such a curriculum should contain the most general and abstract kinds of thought, which include the whole range of human experience in conjunction with logical analytical thought, with the objective of fostering new knowledge. Change and risk are affected by our conceptual frameworks in that both involve the potential for loss. The loss need not be viewed as failure, but as a journey into the unknown. The greatest potential for loss is reflected in loss of self or failure of self, a separation from others or a non-acceptance by others.

For an individual to re-evaluate, to reconsider knowledge acquisition within the scope of the curriculum, a new perception of self must be obtained. This perception of self involves a review of one's abilities and a relinquishing of control over others and the environment. An implication remains for the need of a holistic approach to environmental

education and therefore knowledge acquisition that takes into account an individual's values, culture, goals, abilities and a subjective evaluation of the external situation.

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About the author

Robert L. Horton is an Assistant Professor of Science Curriculum Development in the National Center for Science Teaching and Learning at The Ohio State University.

Susan Hanes is a Graduate Research Associate of Environmental Education at The Ohio State University.

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