The Role of Cognitive Development in the Sustainability Curriculum

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Sustainability Curriculum

Impact on Sustainability

Level I
Conveyance of knowledge and skills about:
Ecological Sustainability, Economic Sustainability, Resource Management, Energy Conservation and Community-Based Models

Level II
Developing a personal and professional ethos about the same
Level I, Knowledge and skills increase awareness and to some degree motivates individuals into doing “good deeds”

Spike does the right thing
Level II, develops the capacity for individuals to realize the need for a lifelong commitment to sustainability.
It is important that a whole host of college educated individuals lead lives committed to sustainability, but the greatest difference can be made when these same college graduates rise into leadership positions within business, industry and government and promote an organizational ethos that favors sustainability.
Level I Sustainability Curriculum + Level II emphasis on developing higher order cognitive abilities =

Realization “that, despite living in a complex, contingent world, he or she must nevertheless construct personal values and principles for living and make personal commitments to people, causes, and career” (Gardiner 1994)
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D – in Cognitive Ability
William Perry “The Fridge”

www.time.com/time/covers/0,16641,19860127,00.html
William Graves Perry Jr.

- BA, English and Greek
  Harvard University, 1935
- MA, English
  Harvard University, 1940
- Founded the Harvard Bureau of Study Counsel in 1947
- Appointed full Professor of Education at the Harvard Graduate School of Education in 1965

http://www.hno.harvard.edu/gazette/1999/05.27/mm.perry.html
Perry's Scheme Of Cognitive And Ethical Development

- DUALISM
  Division of meaning into two realms: Good vs. Bad, Right vs. Wrong, We vs. They. Right Answers exist somewhere for every problem, and authorities know them. Right answers are to be memorized by hard work.
MULTIPLICITY

Diversity of opinion and values is recognized as legitimate in areas where right answers are not yet known. No judgment can be made among them so "everyone has a right to his own opinion; none can be called wrong."
• RELATIVISM

Diversity of opinion, values, and judgment derived from coherent sources, evidence, logics, systems, and patterns allowing for analysis and comparison. Some opinions may be found worthless, while there will remain matters about which reasonable people will reasonably disagree.
• COMMITMENT

An affirmation, choice, decision (career, values, politics, personal relationship) made in the awareness of Relativism.

• **Multiplicity/Subjective Knowledge:**
  There are conflicting answers; therefore, students must trust their "inner voices", not external Authority.

• **Early Multiplicity:**
  There are 2 kinds of problems:
  - those whose solutions we know
  - those whose solutions we don't know yet

Student's task is to learn *how to find* the Right Solutions.
• **Late Multiplicity:**
  Most problems are of the second kind; therefore, everyone has a right to their own opinion
At this point, some students become alienated, and either retreat to an earlier ("safer") position ("I think I'll study math, not literature, because there are clear answers and not as much uncertainty") or else escape (drop out) ("I can't stand college; all they want is right answers" or else "I can't stand college; no one gives you the right answers. ")

-William J. Rapaport, SUNY- Buffalo

http://www.cse.buffalo.edu/~rapaport/perry.positions.html
What Do Studies Using the Perry Scheme Conclude?

Most first-year students of traditional age are Dualistic thinkers (Sanford 1962)

68% of Miami University (Ohio) first-year students were Dualistic thinkers (Baxter-Magolda 1992a)

27% to 56% of students move only 1/3rd of a Perry position during a semester (the rest moved less than that) (Moore 1991)
Another study found that the change from the first-year to graduation was less than one half of a Perry point (Moore cited in MacGregor 1987)

Relativists made up 2% of the graduating class at Miami (Ohio), one year after graduation this amount increased to 12% (Baxter- Magolda 1992a)
A sample of Rutgers University graduates found no Relativists present (Gardiner 1994)

A sample of engineering students at Penn State, the Univ. of Iowa and the Univ. of Missouri found most first-year students to be Dualistic thinkers and showed little movement after two years of college (Wise, Lee, Litzinger and Marra 2001)
A study of horticultural students at Kansas State University found many upper-division students were still operating at lower cognitive levels on the Perry scheme (Lavis 2005).
The Scientific Method

1. Observation
2. Define Problem
3. Propose Hypothesis
4. Gather Evidence
   - Test Hypothesis
   - Reject Hypothesis
   - Retain Hypothesis
5. Develop Theory

Source: Google Images
Method of Inquiry

• Hypothesis

• Gather evidence through literature review (Evidence on both sides of an argument must be present)

• Interpretation (Weigh the merits of available evidence and state where there are gaps in current information)

• Conclusion (1. Which side, if any, has the strongest evidence and why; 2. If no side prevails, what evidence is lacking to reach a conclusion)

Students must examine the credibility of the evidence and its sources (re: experts in the field vs. journalists) and whether the sources are biased or unbiased (trying to persuade readers to their point of view)
Application to Sustainability

Possible topics for student research papers:

• Is more use of nuclear energy a good alternative to coal-fired power plants?
• Will technology produce clean burning cars before the automobile kills us all?
• What impedes cutting carbon emissions the most? Might of rich nations vs. economic opportunity for developing countries
William S. Moore argues that Collaborative Learning can advance student cognitive development because these learning situations:

- “changes in how learners view and understand knowledge and learning”
- “changes in how learners view themselves and their peers”
- “changes in how learners view the role of the teacher”
"This collaborative process involves ... "normal discourse" of academic disciplines-coming to understand what constitutes a good argument in a given context ... notions of argument, evidence, context and judgment are precisely what is involved in the Perry scheme of intellectual and ethical development. This connection makes the Perry model an ideal global assessment of the impact of collaborative learning environments on students."

- William S. Moore
Moore showcases collaborative learning approaches at:

- Evergreen State College
- Western Washington University
- University of New England
- California State Univ., Dominguez Hills
- Daytona Beach Community College

Gains made using the Perry scheme at each location are discussed
Keen and Baldwin (2004) describe community-based research/service learning projects at Allegheny College (PA) that span the natural and social sciences to analyze water quality, reduce waste in streams and local energy consumption, identify environmental problems and enhance forest management.
Keen and Baldwin conclude that such collaborative learning activities make a “strong contribution to students' cognitive, academic, social, civic and career development.”
Such collaborative learning situations can also reverse “Nature Deficit Disorder” and its impact on Human Sustainability

• Raise the “national conscience” about the environment in the college classroom by integrating environmental education
• Promote physical, psychological and cognitive development of children
• Few opportunities for urban children to connect with nature means disconnection with nature as adults.
Slides of this presentation are available at the CCC Institutional Research’s Special Reports and Analyses web page:

www.coconino.edu/instres/specialreports.htm
Ideas, Questions & Comments
References


Moore, W.S. "My Mind Exploded": Intellectual Development as a Critical Framework for Understanding and Assessing Collaborative Learning
www.evergreen.edu/washcenter/resources/acl/iia.html


