

What is Sustainability?
The Role of Sustainability as an Organizing Principle in Higher Education

A White Paper with Conclusions and Recommendations
Working Bibliography

Thomas T. Ankersen
Legal Skills Professor and Director, Conservation Clinic, University of Florida Levin College of
Law
2008-2009 Provost's Faculty Fellow for Sustainability

Gabriela Stocks, Ph.D. candidate
University of Florida Department of Anthropology

"I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it,..."

— Justice Potter Stewart¹

I. Introduction

II. Origin and history of the term

a. From adjective – sustainable this and sustainable that – to noun - sustainability

Brundtland, Gro Harlem

1989 Sustainable Development: An Overview. *Development* 2(3):13-14.

III. Characterizing sustainability within the academy

a. Sustainability as discipline

b. Sustainability as a non-discipline (e.g. interdisciplinary, multidisciplinary or transdisciplinary)

Canning, John

2007 Pedagogy as a Discipline: Emergence, Sustainability and Professionalism. *Teaching in Higher Education* 12(3):393-403.

Caviglia-Harris, Jill L., and James Hatley

2004 Interdisciplinary Teaching: Analyzing Consensus and Conflict in Environmental Studies. *International Journal of Sustainability in Higher Education* 5(4):395-403.

Cortese, Anthony

1999 Education for Sustainability: The Need for a New Human Perspective. Boston: Second Nature, Inc.

Filho, Walter Leal, et al.

2007 Higher Education and the Challenge of Sustainability: Problems, Promises, and Good Practice. Soufli, Greece: Environmental Education Center of Soufli.

¹ *Jacobellis v. Ohio* 378 U.S. 184 (1964)(concurring)(Justice Stewart was describing the term "hardcore pornography.")

- Miller, Thaddeus R., et al.
2008 Epistemological Pluralism: Reorganizing Interdisciplinary Research. *Ecology and Society* 13(2).
- Polk, Merritt, and Per Knutsson
2008 Participation, value rationality and mutual learning in transdisciplinary knowledge production for sustainable development. *Environmental Education Research* 14(6):643-653.
- Scholz, Roland W., et al.
2006 Transdisciplinary Case Studies as a Means of Sustainability Learning: Historical Framework and Theory. *International Journal of Sustainability in Higher Education* 7(3):226-251.
- Stauffacher, Michael, et al.
2006 Learning to Research Environmental Problems from a Functional Socio-Cultural Constructivism Perspective: The Transdisciplinary Case Study Approach. *International Journal of Sustainability in Higher Education* 7(3):252-275.
- Warburton, Kevin
2003 Deep Learning and Education for Sustainability. *International Journal of Sustainability in Higher Education* 4(1):44-56.
- Welsh, M. Ann, and Dale L. Murray
2003 The Ecollaborative: Teaching Sustainability Through Critical Pedagogy. *Journal of Management Education* 27(2):220-235.

c. Sustainability as a science

i. "A room of its own": the National Academy of Sciences

- Clark, William C.
2007 Sustainability Science: A Room of its Own. *Proceedings of the National Academy of Sciences of the United States of America* 104(6):1737-1738.
- Clark, William C., and Nancy M. Dickson
2003 Sustainability science: The emerging research program. *Proceedings of the National Academy of Sciences of the United States of America* 100(14):8059-8061.
- Kates, Robert W., et al.
2001 Sustainability Science. *Science* 292:641-642.

d. Sustainability as philosophy

i. Reductionism vs. holism

- Andersen, Hanne
2001 The history of reductionism versus holistic approaches to scientific research. *Endeavour* 25(4):153-156.
- Dent, Eric B.
1999 Complexity Science: A Worldview Shift. *Emergence* 1(4):5-19.
- Edmonds, Bruce
1999 Pragmatic Holism (or Pragmatic Reductionism). *Foundations of Science* 4(57-82):57.
- Gabora, Liane
1999 Complexity From Theory to Practise: An Interview with Bruce Sawhill. *Foundations of Science* 4:95-105.

- Jackson, Michael C.
2006 Creative holism: a critical systems approach to complex problem situations. *Systems Research and Behavioral Science* 23(5):647(11).
- Malanson, George P.
1999 Considering complexity. *Annals of the Association of American Geographers* 89(4):746.
- Verschuren, Piet J.M.
2001 Holism versus Reductionism in Modern Social Science Research. *Quality and Quantity* 35:389-405.
- Walsh, Anthony
1997 Methodological Individualism and Vertical Integration in the Social Sciences. *Behavior and Philosophy* 25(2):121-136.
- Wood, Thomas, and Miguel P. Caldas
2001 Reductionism and Complex Thinking During ERP Implementations. *Business Process Management* 7(5):387-393.

e. Sustainability as ideology

i. "Warm and Fuzzy" – The perils of political correctness

1. The University of Delaware case study

- Kersten, Katherine
2008 Sustainability can be a Warm, Fuzzy Word that Invites Tyranny. *In* Star Tribune. Minneapolis.
- Leo, John
2008 The Worst Campus Codeword. Electronic document, accessed February 20, 2009. http://www.mindingthecampus.com/originals/2008/04/the_worst_campus_codeword.htm
- Wood, Thomas
2008 How Many Delawares: The Communitarian ResLife Movement Princeton: National Association of Scholars.

IV. What is sustainability education?

a. Difference between sustainability education and related pedagogy

i. Environmental studies, environmental education, sustainable development education

ii. Other interdisciplinary programs

b. The Association of Sustainability in Higher Education

- Bonnett, Michael
1999 Education for Sustainable Development: A Coherent Philosophy for Environmental Education? *Cambridge Journal of Education* 29(3):313-324.
- 2006 Education for Sustainability as a Frame of Mind. *Environmental Education Research* 12(3):265-276.
- Clugston, Richard M., and Wynn Calder
1999 Critical Dimensions of Sustainability in Higher Education. *In* Sustainability and University Life. W.L. Filho, ed. Bern: Peter Lang.

- Corcoran, Peter Blaze, Kim E. Walker, and Arjen E. J. Wals
2004 Case Studies, Make-Your-Case Studies, and Case Stories: A Critique of Case Study Methodology in Sustainability in Higher Education. *Environmental Education Research* 10(1):7-21.
- Cortese, Anthony
1999 *Education for Sustainability: The Need for a New Human Perspective*. Boston: Second Nature, Inc.
- Cotton, D.R.E., et al.
2007 Sustainable Development, Higher Education and Pedagogy: A Study of Lecturers' Beliefs and Attitudes. *Environmental Education Research* 13(5):579-597.
- da Costa Lima, Gustavo
2003 O Discurso da Sustentabilidade e suas Implicações Para a Educação. *Ambiente & Sociedade* VI(2):99-119.
- Davis, S.A., et al.
2003 Educating Sustainable Societies for the Twenty-First Century. *International Journal of Sustainability in Higher Education* 4(2):169-179.
- Dawe, Gerald, Rolf Jucker, and Stephen Martin
2005 *Sustainable Development in Higher Education: Current Practice and Future Developments*. Heslington, York: The Higher Education Academy.
- Down, Lorna
2006 Addressing the Challenges of Mainstreaming Education for Sustainable Development in Higher Education. *International Journal of Sustainability in Higher Education* 7(4):390-399.
- du Preez, Nicolaas P., and Maryna Mohr-Swart
2004 An Integrated Approach to Environmental Education: A Case study. *International Journal of Sustainability in Higher Education* 5(1):11-20.
- Eagan, Patrick, Tanya Cook, and Erhard Joeres
2002 Teaching the Importance of Culture and Interdisciplinary Education for Sustainable Development. *International Journal of Sustainability in Higher Education* 3(1):48-66.
- Elliott, John
1999 Sustainable Society and Environmental Education: Future Perspectives and Demands for the Educational System. *Cambridge Journal of Education* 29(3):325-340.
- Filho, Walter Leal
2000 Dealing with Misconceptions on the Concept of Sustainability. *International Journal of Sustainability Education* 1(1):9-19.
- Filho, Walter Leal, et al.
2007 *Higher Education and the Challenge of Sustainability: Problems, Promises, and Good Practice*. Soufli, Greece: Environmental Education Center of Soufli.
- Forshee, Jenn, Les Thiele, and Thomas Ankersen
2008 *Sustainability and Service Learning*. Gainesville: University of Florida.
- Foster, John
2001 Education as Sustainability. *Environmental Education Research* 7(2):153-165.
- Garrard, Greg
2007 Ecocriticism and Education for Sustainability. *Pedagogy: Critical Approaches to Teaching Literature, Language, Composition, and Culture* 7(3):359-383.

- Hayles, Carolyn S., and Sarah E. Holdsworth
2008 Curriculum Change for Sustainability. *Journal for Education in the Built Environment* 3(1):25-48.
- Huckle, John
1993 Environmental Education and Sustainability: A View from Critical Theory. *In Environmental Education: A Pathway to Sustainability*. J. Fien, ed. Pp. 43-68. New York: Hyperion Books.
- Jickling, Bob
1994 Studying Sustainable Development: Problems and Possibilities. *Canadian Journal of Education* 19(3):231-240.
- Jickling, Bob, and Helen Spork
1998 Education for the Environment: A Critique. *Environmental Education Research* 4(3):309-327.
- Jucker, Rolf
2002 "Sustainability? Never Heard of It!" Some Basics We Shouldn't Ignore When Engaging in Education for Sustainability. *International Journal of Sustainability in Higher Education* 3(1):8-18.
- Kagawa, Fumiyo
2007 Dissonance in Students' Perceptions of Sustainable Development and Sustainability: Implications for Curriculum Change. *International Journal of Sustainability in Higher Education* 8(3):317-338.
- Kaivola, Taina, and Liisa Rohweder
2007 Towards Sustainable Development in Higher Education: Reflections. Finland: Ministry of Education.
- Leo, John
2008 The Worst Campus Codeword.
- Martens, Pim
2006 Sustainability: Science or Fiction? Sustainability: Science, Practice, & Policy 2(1).
- McKeown, Rosalyn, and Charles Hopkins
2003 EE != ESD: Defusing the Worry. *Environmental Education Research* 9(1):117.
- Mebratu, Desta
1998 Sustainability and Sustainable Development: Historical and Conceptual Review. *Environmental Impact Assessment Review* 18:493-520.
- Moore, Janet
2005 Seven Recommendations for Creating Sustainability Education at the University Level. *International Journal of Sustainability in Higher Education* 6(4):326-339.
- Muijen, Heidi
2004 Integrating Value Education and Sustainable Development into a Dutch University Curriculum. *International Journal of Sustainability in Higher Education* 5(1):21-32.
- Newport, Dave, Thomas Chesnes, and Angela Lindner
2003 The "Environmental Sustainability" Problem: Ensuring that Sustainability Stands on Three Legs. *International Journal of Sustainability in Higher Education* 4(4):357-363.
- Pepper, Coral Mary
2007 Leading for Sustainability, Murdoch University.

- Perdan, Slobodan, Adisa Azapagic, and Roland Clift
2000 Teaching Sustainable Development to Engineering Students. *International Journal of Sustainability in Higher Education* 1(3):267-279.
- Plant, Malcolm
1995 The Riddle of Sustainable Development and the Role of Environmental Education. *Environmental Education Research* 1(3):253.
- Sauve, Lucie
1996 Environmental Education and Sustainable Development: A Further Appraisal. *Canadian Journal of Environmental Education* 1:7-34.
- 1999 Environmental Education Between Modernity and Postmodernity: Searching for and Integrating Education Framework. *Canadian Journal of Environmental Education* 4:9-35.
- Sherren, Kate
2008 A history of the future of higher education for sustainable development. *Environmental Education Research* 14(3):238 - 256.
- Smyth, John C.
2006 Environment and Education: A View of a Changing Scene. *Environmental Education Research* 12(3):247-264.
- Stables, Andrew, and William Scott
2002 The Quest for Holism in Education for Sustainable Development. *Environmental Education Research* 8(1):53-60.
- Sterling, Stephen
n.d. Sustainable Education: Putting Relationship Back Into Education. *Convergence Magazine*.
- Thomas, Ian
2004 Tertiary or Terminal: A Snapshot of Sustainability Education in Australia's Universities. *In Effective Sustainability Education Conference*. Sydney, Australia.
- Thomas, Ian, and Jennifer Nicita
2002 Sustainability Education and Australian Universities. *Environmental Education Research* 8(4):475-492.
- Tilbury, Daniella
1995 Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research* 1(2):195.
- van Weenen, Hans
2000 Towards a Vision of a Sustainable University. *International Journal of Sustainability in Higher Education* 1(2):20-34.
- von Hauff, Michael, and Peter A. Wilderer
2008 Industrial Ecology: Engineered Representation of Sustainability. *Sustainability Science* 3(103-115):103.
- Warburton, Kevin
2003 Deep Learning and Education for Sustainability. *International Journal of Sustainability in Higher Education* 4(1):44-56.
- Wemmenhove, Roos, and Wouter T. de Groot
2001 Principles for University Curriculum Greening: An Empirical Case Study from Tanzania. *International Journal of Sustainability in Higher Education* 2(3):267-283.

Wood, Thomas

2008 How Many Delawares: The Communitarian ResLife Movement Princeton: National Association of Scholars.

Wright, Tarah S.A.

2002 Definitions and Frameworks for Environmental Sustainability in Higher Education. *International Journal of Sustainability in Higher Education* 3(3):203-220.

V. Universities as complex organizations

a. Complexity theory

i. Self organization and imposition of structure

ii. Stewarded vs. un-stewarded self-organization

Byrne, David

1998 Complexity Theory and the Social Sciences: An Introduction. London: Routledge.

Clippinger, John Henry

1999 The Biology of Business: Decoding the Natural Laws of Enterprise. San Francisco: Jossey-Bass Publishers.

Dent, Eric B.

1999 Complexity Science: A Worldview Shift. *Emergence* 1(4):5-19.

Dooley, Kevin J.

1997 A Complex Adaptive Systems Model of Organization Change. *Nonlinear Dynamics, Psychology, and Life Sciences* 1(1):69-97.

Fuchs, Christian

2002a Concepts of Social Self-Organisation. *In* INTAS Project Report. Vienna: Vienna University of Technology.

—

2002b Social Information and Self-Organisation. *In* Cybernetics and Systems. R. Trappl, ed. Pp. 225-230. Vienna: Austrian Society for Cybernetic Studies.

Fuchs, Christian, Wolfgang Hofkirchner, and Bert Klauninger

2002 The Dialectic of Bottom-Up and Top-Down Emergence in Social Systems. Paper presented at the Problems of Individual Emergence Conference.

Gabora, Liane

1999 Complexity From Theory to Practise: An Interview with Bruce Sawhill. *Foundations of Science* 4:95-105.

Geus, Arie de

1997 The Living Company. Boston: Harvard Business School Press.

Hazy, James K., Jeffrey A. Goldstein, and Benyamin B. Lichtenstein, eds.

2007 Complex Systems Leadership Theory: New Perspectives from Complexity Science on Social and Organizational Effectiveness. Pocklington, UK: ISCE Publishing.

Holland, J.H.

1995 Hidden Order: How Adaptation Builds Complexity. Reading, MA: Addison-Wesley.

Jantsch, E.

1980 The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution. Oxford: Pergamon Press.

Lucas, Chris

2008 Self-Organizing Systems FAQ

- Malanson, George P.
1999 Considering complexity. *Annals of the Association of American Geographers* 89(4):746.
- Maturana, H.R., and F.J. Varela
1987 *The Tree of Knowledge: The Biological Roots of Human Understanding*. Boston: New Science Library.
- Miller, John H., and Scott E. Page
2007 *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton: Princeton University Press.
- Nicolis, G., and I. Prigogine
1977 *Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order Through Fluctuations*. New York: Wiley.
- Norberg, Jon, and Graeme Cumming
2008 *Complexity Theory for a Sustainable Future*. New York City: Columbia University Press.
- Varela, F. G., H. R. Maturana, and R. Uribe
1974 Autopoiesis: The organization of living systems, its characterization and a model. *Biosystems* 5(4):187-196.
- Wheatley, Margaret
1999 *Leadership and the New Science: Discovering Order in a Chaotic World*. San Francisco: Berrett-Koehler Publishers.

VI. Beyond teaching, research and service

a. Should a university's mission be "purposeful" or "deliberately purposeless"?

- Uhl, Christopher, et al.
1996 Sustainability: A Touchstone Concept for University Operations. *Conservation Biology* 10(5):1308-1311.

VII. Sustainability journals

a. An empirical evaluation of content

VIII. Beyond Sustainability...Is there another there out there?