**Sustainability Improves Student Learning: Resources List**

**This resource collection is a work in progress developed by the Department of Education funded initiative “Sustainability Improves Student Learning in STEM.” This initiative consists of over 50 members of 11 different STEM disciplinary societies in the U.S. working to advance education for a sustainable future. More information can be found here:** [**www.aacu.org/pkal/sisl**](http://www.aacu.org/pkal/sisl)

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# A. Sustainability in the College Curriculum

## A1. General resources on teaching for a sustainable future

**Sustainability: The ultimate liberal art**

Frank Rhodes

Section: The Chronicle Review  
Volume 53, Issue 9, Page B24, 2006.

<http://chronicle.com/article/Sustainability-the-Ultimate/29514/>

**Building Concepts of Sustainability into the Undergraduate Curriculum**

Curriculum for the Bioregion Initiative, Washington Center, Evergreen State College,

<http://www.evergreen.edu/washcenter/resources/upload/Integrating_Sustainability_Across_the_Curriculum.pdf>

**1. "Add-a-course"** approach. A good step! But, important topics are often isolated in elective status or into one disciplinary lens, e.g., sustainability just as a dimension of, or a sidebar to environmental studies.

**2. Re-orientation of majors, minors, or general education curricula.** The current driver for sustainability is the development of global understandings and competence or the involvement of students in civic engagement. Rich sites for learning are, of course, freshman seminars and senior capstone experiences.

**3. Interdisciplinary curricula** – Either through new, added courses, or through curricular learning communities that link or cluster 2-3 classes during a given term and enroll a common cohort of students.

**4.** The addition of **community-based learning** or **service-learning** to existing classes, that grounds theory in practice.

**Engaging Students in Big Questions**

Aaron Brower, University of Wisconsin-Madison, Center for Teaching and Learning, 2010.

<https://tle.wisc.edu/node/1088>

**Sustainability Site Guide from SERC (Science Education Resource Center):**

<http://serc.carleton.edu/serc/site_guides/sustainability.html>

**Education for a Sustainable Future**

Debra Rowe, *Science*, July 20, 2007, *Vol. 317 no. 5836 pp. 323-324*

**S**ustainability is a lens through which increasing numbers of individual colleges and universities, as well as national organizations, are collectively examining and acting upon our shared world systems ([1](http://www.sciencemag.org/content/317/5836/323.full?ijkey=ufVXDh1P./8wA&keytype=ref&siteid=sci#ref-1), [2](http://www.sciencemag.org/content/317/5836/323.full?ijkey=ufVXDh1P./8wA&keytype=ref&siteid=sci#ref-2)). In the United States, a national trend has begun, but much more needs to be done.

<http://www.sciencemag.org/content/317/5836/323.full?ijkey=ufVXDh1P./8wA&keytype=ref&siteid=sci>

**Higher Education as A Change Agent for Sustainability In Different Cultures and Contexts**

Stephens, Jennie C. & Maria E. Hernandez & Mikael Rom‡n & Amanda C. Graham & Roland W. Scholz. 2008." International Journal of Sustainability in Higher Education, v9n3 (2008): 317-338.  Purpose - The goal of this paper is to enhance consideration for the potential for institutions of higher education throughout the world, in different cultures and contexts, to be change agents for sustainability. <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

**[Education for Sustainability: Guides for Teaching and Learning](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fr20.rs6.net%2ftn.jsp%3fllr%3dypfrgybab%26et%3d1108952305391%26s%3d717%26e%3d001Q8CUHPoE-6AX9DoBrqBxguq04AD37U68Eof4N6Lt_5F2DSkgoc40q1C6jy85cAgPNRJsThaTjQyYGucicLQvdefIFpL0PR3icz48r9MD2zJb8X25dV_LjQx_1skRZzkA6HKjUHvivl4UQYGYpI--5i4Z_h952pcrxdm4ANaL5JadoHGnU6nd6OzOroPFNhg3CUK3FP-3wyz90LAfCSpibXO2CPvRL3zeK6uO45E2SLI%3d" \t "_blank)**  
In an effort to provide a framework for enhancing teaching and learning in sustainability, the Sustainability Team at the University of Gloucestershire (UK) has released two installments of its Education for Sustainability (EfS): Guides for Teaching and Learning series. [A Guide for University Managers on Needs and Opportunities](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2finsight.glos.ac.uk%2fsustainability%2fEducation%2fDocuments%2fEfS%2520Managers%2520Guide%2520NEW%2520Sept2011.pdf" \t "_blank) explores strategic needs, benefits and the potential for EfS in the curriculum and in partnership with external organizations. [A Guide for Educators on Teaching and Learning Approaches](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2finsight.glos.ac.uk%2fsustainability%2fEducation%2fDocuments%2fEfS%2520Educators%2520Guide%2520FINAL%25207July11.pdf" \t "_blank) provides orientation on the aims and principles of EfS to inform curriculum development work.

**Climate Literacy and Energy Awareness Network (CLEAN)**

<http://cleanet.org/index.html>

The CLEAN project, a part of the National Science Digital Library, provides a comprehensive collection of climate science and climate literacy resources for students in grades 6-16 and informal citizen learners. The overarching goal of the CLEAN Pathway project is to introduce standards-aligned "civic science" materials to promote responsible energy use and planetary stewardship for a sustainable future.

**New Earth Archive**

<http://neweartharchive.forumotion.com/>

A database in progress, cataloguing consciousness-raising books and videos for students and citizens relevant to climate and socioeconomic change.

Resources and publications from United Nations University’s Education for Sustainable Development program: <http://www.ias.unu.edu/sub_page.aspx?catID=108&ddlID=186>

Stevenson R, Brody M, Dillon J, Wals A (eds.) 2012**. [International Handbook of Research on Environmental Education](http://www.amazon.com/International-Handbook-Research-Environmental-Education/dp/0415892392/ref=sr_1_1?s=books&ie=UTF8&qid=1332501926&sr=1-1" \t "_blank).** Routledge: London.

Johnston LF 2012**. Higher Education for Sustainability: Cases, Challenges, and Opportunities from Across the Curriculum.** Routledge: London.

Book series ‘**Higher Education for Sustainability’**, edited by Gerd Michelsen, VAS-Verlag: Bad Homburg

Zandvliet DB (ed.) 2010. **Diversity in Environmental Education Research.** Sense Publishers: Boston.

Leal Filho W (ed.) 2009**. Sustainability at universities – opportunities, challenges and trends.** Lang: Frankfurt am Main.

Jones P, Selby D, Sterling SR (eds.). **2010.** Sustainability education: Perspectives and practice across higher education. Earthscan: London, Sterling, VA

[Gough](http://www.amazon.com/Stephen-Gough/e/B001HOFG20/ref=ntt_athr_dp_pel_1" \t "_blank) S, Scott W. 2008. **Higher Education and Sustainable Development: Paradox and Possibility (Key Issues in Higher Education)**. Routledge: London.

## A2. Courses that teach sustainability

**147 Practical Tips for Teaching Sustainability**

Connecting the Environment, the Economy, and Society

William M. Timpson, Brian Dunbar, Gailmarie Kimmel, Brett Bruyere, Peter Newman, and Hillary Mizia

[**http://www.atwoodpublishing.com/books/245.htm**](http://www.atwoodpublishing.com/books/245.htm)

[Environmental Literacy and Sustainability as Core Requirements: Success Stories & Models](http://www.ncseonline.org/EFS/DebraRowe.pdf), Rowe.

from Teaching Sustainability at Universities, series ed. Leal Filho, Walter, Peter Lang, NY, NY, 2002.

**Association for the Advancement of Sustainability (**[**AASHE**](http://www.aashe.org/)**)**

[Curriculum resources](http://www2.aashe.org/resources/curriculum.php) for courses that address sustainability.

## A3. Courses that teach climate change

**Climate Change Education Modules** (all disciplines)

National Council for Science and the Environment

Using NASA data, modules have been developed for use in general education courses on climate change that colleges and universities across the country can readily adopt and adapt. The modules were developed as part of the [Climate Change Education Initiative](http://e2ma.net/go/6970398377/208468762/219665318/1401437/goto:http:/ncseonline.org/Climate/) by NCSE's [Council of Environmental Deans and Directors](http://e2ma.net/go/6970398377/208468762/219665319/1401437/goto:http:/ncseonline.org/CE) and funded by a NASA Global Climate Change Education grant. All discipline scan include climate change information in their teaching.

<http://ncseonline.org/climate/cms.cfm?id=3818>

**Academic Guidance Document**

Signatories to the American College and University Presidents’ Climate Commitment have committed to take “actions to make climate neutrality and sustainability a part of the curriculum and other educational experiences for all students.” This guidance document, *Education for Climate Neutrality and Sustainability*, is designed to identify some of the best practices across higher education and to provide resources.

<http://www.presidentsclimatecommitment.org/resources/guidance-documents/academic>

# B. Learning Outcomes for Courses

**Sustainability Learning Outcomes**

Lists of sustainability “big ideas,” sustainability skills, and sustainability habits of mind

Curriculum for the Bioregion Initiative, Washington Center, Evergreen State College,

<http://www.evergreen.edu/washcenter/resources/upload/Integrating_Sustainability_Across_the_Curriculum.pdf>

**Learning Outcomes for Sustainable Development In Higher Education**

Svanstršm, Magdalena & Francisco J. Lozano-Garcia & Debra Rowe. 2008. International Journal of Sustainability in Higher Education, v9n3 (2008): 339-351.

Discusses “the commonalities that can be found in learning outcomes (LOs) for education for sustainable development in the context of the Tbilisi and Barcelona declarations and across different countries. The commonalities include systemic or holistic thinking, the integration of different perspectives, skills such as critical thinking, change agent abilities and communication, and finally different attitudes and values.”

<http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ808628&ERICExtSearch_SearchType_0=no&accno=EJ808628>

**ACPA College Student Educators International**

Sustainability Taskforce Student Learning Outcomes

A chart with seven learning outcomes (not discipline specific). See the first column

<http://www.myacpa.org/task-force/sustainability/docs/Learning_Outcomes_Sustainability_Map.pdf>

# C. Pedagogies and Learning Activities

**Deep Learning Strategies in Education for Sustainability across disciplines:**

Marshall, S. (2010). Re-Imagining Specialized STEM Academies: Igniting and Nurturing Decidedly Different Minds, by Design. *Roeper Review*, 32(1), 48-60. doi:10.1080/02783190903386884

“A personal vision and conceptual design for reimagining specialized science, technology, engineering, and mathematics (STEM) academies designed to nurture *decidedly* *different* STEM minds and ignite a new generation of global STEM talent, innovation, and entrepreneurial leadership. This design enables students to engage actively in the authentic work, modes of inquiry, and practices that distinguish four STEM learning cultures, environments, and communities: (a) Inquiry and Research Laboratory and Interdisciplinary Learning Center—develops disciplinary, interdisciplinary, and inquiry-based thinking; (b) Innovation Incubator and Design Studio—ignites innovative and design-based thinking; (c) Global Leadership and Social Entrepreneurship Institute—nurtures change leadership and systems-based thinking; and (d) Leadership, Innovation and Knowledge (LINNK) Commons—connects the knowledge, innovation, leadership resources, and networks of the global STEM commons to collaboratively solve complex problems that advance both the new STEM frontier and the human future.”

**Problem-based Case Learning**

The Getting Started Guide is designed to explain to interested faculty how to begin the process of learning, designing, and implementing PBCL in their classrooms. <http://www.makinglearningreal.org/prodev2.html>

**Integrating Project-based Learning throughout the Undergraduate Engineering Curriculum**

Savage, R. N., Chen, K. C., & Vanasupa, L. 2007, Journal of STEM Education: Innovations & Research, 8(3/4), 15-27.

“…In the United States, the National Academy of Engineering has underscored the need for these changes and has established a center to facilitate systematic reform of engineering education… [1]. The Accreditation Board for Engineering and Technology has modified their accreditation criteria to place an emphasis on project-based learning (problem solving) and self-directed learning which supports life-long learning [2]… a common theme is to emphasize the creative elements of engineering through the integration of project-based learning (PBL) experiences. …gives students a contextual environment that makes learning relevant and focused. Solving the problem drives learning, rather than the traditional “teach by telling” lecture format…”

**Science Education for New Civic Engagements and Responsibilities (SENCER)**

“SENCER improves science education by focusing on real world problems and, by so doing, extends the impact of this learning across the curriculum to the broader community and society.”

[www.sencer.net](http://www.sencer.net)

**What works in Facilitating Interdisciplinary Learning in Science and Mathematics** <https://secure.aacu.org/source/Orders/index.cfm?section=unknown&task=3&CATEGORY=AS&PRODUCT_TYPE=SALES&SKU=PKALWORKS&DESCRIPTION=&FindSpec=&CFTOKEN=84612314&continue=1&SEARCH_TYPE>=

**Connected Math Project**

Michigan State University, for K-12 with implications for higher education.

<http://www.phschool.com/cmp2/> and <http://connectedmath.msu.edu/>

**Affective Learning:**

Shephard, Kerry. 2008. "[Higher Education for Sustainability: Seeking Affective Learning Outcomes](http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Shephard-Affective_Learning_Outcomes.pdf" \t "_blank)," International Journal of Sustainability in Higher Education, v9n1 (2008): 87-98.  [Purpose - The purpose of this paper is to interpret aspects of education for sustainability in relation to educational theories of the affective domain (values, attitudes and behaviours) and suggest how the use of these theories, and relevant experience, in other educational areas could benefit education for sustainability. Design/methodology/approach - An analysis based on a literature review of relevant educational endeavours in affective learning. Findings - This paper suggests that most teaching and assessment in higher education focus on cogitative skills of knowledge and understanding rather than on affective outcomes of values, attitudes and behaviours. Some areas of higher education, however, have effectively pursued affective outcomes and these use particular learning and teaching activities to do so. Key issues for consideration include assessing outcomes and evaluating courses, providing academic credit for affective outcomes, key roles for role models and designing realistic and acceptable learning outcomes in the affective domain. Practical implications - Educators for sustainability could use this relevant theoretical underpinning and experience gained in other areas of education to address the impact of their own learner-support activities. Originality/value - Educators have traditionally been reluctant to pursue affective learning outcomes but often programmes of study simply fail to identify and describe their legitimate aims in these terms. This paper emphasises the application of a relevant theoretical underpinning to support educators' legitimate aspirations for affective learning outcomes. It will also help these educators to reflect on how the use of these approaches accords with the liberal traditions of higher education.] Description from <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

Sipos, Yona & Bryce Battisti & Kurt Grimm. 2008. " [Achieving Transformative Sustainability Learning: Engaging Head, Hands and Heart](http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Sipos+Transformative_Sust_Edu.pdf" \t "_blank)," Journal of Sustainability in Higher Education, v9n1 (2008): 68-86.  [Purpose - The current UN Decade of Education for Sustainable Development echoes many scholars' calls to re-envision education for sustainability. Short of a complete overhaul of education, the paper seeks to propose learning objectives that can be integrated across existing curricula. These learning objectives are organized by head, hands and heart - balancing cognitive, psychomotor and affective domains. University programs and courses meeting these learning objectives exhibit an emergent property here termed transformative sustainability learning (TSL). Findings - The paper finds: advancement of head, hands and heart as an organizing principle by which to integrate transdisciplinary study (head); practical skill sharing and development (hands); and translation of passion and values into behaviour (heart); development of a cognitive landscape for understanding TSL as a unifying framework amongst related sustainability and transformative pedagogies that are inter/transdisciplinary, practical and/or place-based; creation of learning objectives, organized to evaluate a course or program's embodiment of TSL. Originality/value - By enabling change within existing structures of higher education, the paper complements and contributes to more radical departures from the institution. The work to date demonstrates potential in applying this learning framework to courses and programs in higher education.] Description from <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

**Progressive Pedagogy Model for Project Based Service Learning:**

Abstract: This article explores the use of a new teaching and learning model that incorporates diverse progressive teaching methods to create an innovative tool for educators. The Partnership For Learning Model (PFLM), was created specifically for service learning students, community partners,and faculty with a carefully choreographed series of classroom exercises This model, along with its corresponding exercises and assignments, may be applied to a wide range of professional, academic courses that will enhance student's life skills and provide real world benefits for the communities where it is used.

**Multiple Teaching and Learning Methodologies:**

Kaiser, F. G. & Fuhrer, U. (2003). Ecological Behavior’s Dependency on Different Forms of Knowledge, Applied Psychology: An International Review. Supports the need for STEM and/or education for sustainability to engage in multiple teaching and learning methodologies for personal and societal sustainable behavior.

**The Environmental Literacy Framework**

An Earth Systems approach to teaching environmental literacy. The material at this site is intended to promote an extended conceptual framework for environmental literacy that covers the major Earth systems: atmosphere, hydrosphere, geosphere and biosphere. Each of these comprises an environmental literacy science unit; a fifth unit, Energy, provides unifying concepts that capture the dynamic nature of the Earth systems. Each of these units was developed from an underlying set of essential principles derived from earlier literacy efforts of other groups of science and education professionals*.*

[http://andrill.org/education/c2s2/ELF\_Essential\_Principles.html](http://andrill.org/education/c2s2/ELF_Essential_Principles.html" \t "_blank)

**Partners for community based learning**

<http://climatecommunities.us/about.html>

 Climate Communities is a national coalition of cities and counties that is educating federal policymakers about the essential role of local governments in developing new approaches to create livable communities, reduce energy use and curb greenhouse gas emissions. Climate Communities is working with local governments to ensure that federal policies provide strong incentives and resources for local clean energy and sustainability actions

**Structuring activities around newspaper articles**

<http://serc.carleton.edu/nnn/teaching_news/examples.html>

Examples are provided to illustrate the variety of study questions one can devise around a single newspaper article. One should consider these examples not necessarily as student activities that can be quickly brought into class, but rather as models for instructors to create their own case studies of current, relevant, and thought provoking news articles. Can easily be adapted for sustainability topics.

**Quantitative Writing Examples from the National Numeracy Network**:

<http://serc.carleton.edu/nnn/quantitative_writing/examples.html>

Quantitative writing (QW) requires students to grapple with numbers in a real world context, to describe observations using numbers, and to use the numbers in their own analyses and arguments. Good quantitative writing assignments ask students to do more than compute an answer. In addition, they ask students to draw conclusions based on numerical or other quantitative evidence, which is either supplied or which the students must develop.

The **National Wildlife Federation has over 600 sustainability case studies** from innovative higher education campuses across the U.S. spanning more than a decade. It is searchable by topic, year and school, and includes information on each college’s project goals, successes, challenges, funding strategies and project leaders: **[http://www.nwf.org/campusecology/resources/yearbook/](http://www.nwf.org/campusecology/resources/yearbook/" \t "_blank)**

**Community Works Institute: Curriculum Resource for Service Learning and Sustainability**

http://communityworksinstitute.org/cwpublications/index.html

# D. Sustainability Resources by Discipline

## Biology

The National Association of Biology Teachers (NABT) has infused sustainability into a number of their activities and communications.

* [Letter from Association President](http://www.aashe.org/dans/LetterfromPres.April.pdf.pdf) (PDF)
* [Journal Editorial](http://www.aashe.org/dans/EditorialApril.pdf.pdf) (PDF)
* [Journal Article](http://www.aashe.org/dans/EnviromentDickins.pdf.pdf) (PDF)
* [E-newsletter](http://www.aashe.org/dans/documents/NABTENewsletter.pdf) (PDF)
* The National Association of Biology Teachers (NABT) released an official statement on the teaching of sustainability issues. You can find the statement [here](http://www.nabt.org/websites/institution/index.php?p=520).
* The May issue of *The American Biology Teacher* featured sustainability as a dominant theme. The table of contents can be found [here](http://www.nabt.org/websites/institution/index.php?p=30).
* NABT highlighted [teaching resources](http://www.nabt.org/websites/institution/index.php?p=178) related to this issue.

**A New Biology for the 21st Century**

National Academies, 2009

http://www.nap.edu/openbook.php?record\_id=12764

**Vision and Change in Undergraduate Biology Education: A View for the 21st century**

An AAAS initiative sponsored by NSF

http://visionandchange.org/

***BioScience***: Published monthly by the American Institute of Biological Sciences, includes articles about research findings and techniques, advances in biology education, professionally written feature articles about the latest frontiers in biology, discussions of professional issues, book reviews, news about AIBS, a policy column (Washington Watch), and an education column (Eye on Education). Roundtables, forums, and viewpoint articles offer the perspectives of opinion leaders and invite further commentary. Sustainability is a frequent topic of articles. Recent articles include:

* *Socioenvironmental Sustainability and Actionable Science*, a Viewpoint by Margaret A. Palmer, director of the National Socio-Environmental Synthesis Center. http://www.jstor.org/stable/full/10.1525/bio.2012.62.1.2
* *Sustainability Challenges of Phosphorus and Food: Solutions from Closing the Human Phosphorus Cycle*, by Daniel L. Childers, Jessica Corman, Mark Edwards, James J. Elser. http://www.jstor.org/stable/full/10.1525/bio.2011.61.2.6
* *What Does It Mean to Successfully Conserve a (Vertebrate) Species?* Kent H. Redford, et al. http://www.jstor.org/stable/10.1525/bio.2011.61.1.9

**EcoEd Digital Library**: The Ecological Society of America's EcoEd Digital Library (EcoEdDL) is a forum for scientists and educators to locate and contribute peer reviewed resources for 21st century undergraduate ecology education. Many resources have a sustainability focus.

## Business

* The Association to Advance Collegiate Schools of Business (AACSB) maintains an [Ethics & Sustainability Resource Center](http://www.aacsb.edu/resources/ethics-sustainability/default.asp) with numerous tools, publications and other resources.
* [The Association to Advance Collegiate Schools of Business (AACSB) Sustainability Conference](http://www.aacsb.edu/Sustainability/index.html): Sustainable business has become a strong standard across industries, not just in terms of being "green" but also by being socially and ethically responsible. Learn more about sustainable business and AACSB's work in this area through this sustainability conference. More information is here.
* The [**Aspen Institute**](http://www.aspeninstitute.org/)**:** [2008-2009 *Guide to Socially Responsible MBA Programs*](http://www.bkconnection.com/ProdDetails.asp?ID=9781576756669). The new global guide provides an overview of how MBA programs bring environmental, social, and ethical issues management into their curricular and extracurricular programs.
* [The AACSB Sustainability Conference](http://www.aacsb.edu/sustainability/index.html) combines a diverse group of experts and educators to discuss elements of sustainable business, corporate social responsibility, ethics, and special initiatives to implement effective changes at business schools and corporations.
* **Principles for Responsible Management Education** ([PRME](http://www.unprme.org)) provide framework for academic institutions to advance corporate social responsibility through the incorporation of universal values into curricula and research. The PRME is coordinated by a Steering Committee constituted of the Association to Advance Collegiate Schools of Business (AACSB International), the European Foundation for Management Development (EFMD), the Aspen Institute's Business and Society Program, the European Academy for Business in Society (EABIS), the Graduate Management Admission Council (GMAC), the Globally Responsible Leadership Initiative (GRLI), Net Impact and the United Nations Global Compact.
* [Beyond Grey Pinstripes](http://www.beyondgreypinstripes.org/) is a biennial survey and alternative ranking of business schools. Our mission is to spotlight innovative full-time MBA programs that are integrating issues of social and environmental stewardship into curricula and research.

Sustainability oriented business-teaching materials and resources:

* International Federation of Accountants - [Sustainability Framework](http://web.ifac.org/sustainability-framework/overview)
* [CasePlace](http://www.caseplace.org/) - resource for up-to-date case studies, syllabi and innovative MBA teaching materials on business and sustainability— from corporate governance to sustainable development.
* [World Business Council for Sustainable Development](http://www.wbcsd.org/) - (WBCSD) is a CEO-led, global association of some 200 companies dealing exclusively with business and sustainable development
* [BELL Teaching Case Studies](http://www.wri.org/publication/bell-teaching-case-studies) -   BELL teaching cases explore sustainability related business challenges and capture business decisions that identify environmental challenges as business development opportunities.
* Natural Step Case studies
  + [Scandic Hotels](http://www.thenaturalstep.org/en/system/files/Scandic+Hotels+Case+Study_Dec+2008.pdf)
  + [The Co-operators](http://www.thenaturalstep.org/en/system/files/The_Co-operators_TNScasestudy.pdf)
* [Center for Sustainable Systems – case studies](http://css.snre.umich.edu/makeframe.php?content=4_1_NewPubs)
* [Entrepreneurs for Sustainability - Success Stories](http://www.e4sustainability.org/stories/stories.htm)
* [Net Impact](http://www.netimpact.org/)
* [2008 Guide to Social & Environmental Issues in Graduate Business Programs](http://www.netimpact.org/displaycommon.cfm?an=1&subarticlenbr=2288)

## Chemistry

* [Sustainability Statement](http://www.aashe.org/dans/documents/c6_sust_state2007Jul15.pdf) signed by [C6](http://www.sfc.fr/C6.html) (the six national chemistry organizations from around the world) C6 is made up of [ACS](http://www.acs.org/) (USA), [CSJ](http://www.csj.jp/index-e.html) (Japan), [GDCh](http://www.gdch.de/) (Germany), [KNCV](http://www.kncv.nl/) (Netherlands), [RSC](http://www.rsc.org/) (England) and [SFC](http://www.sfc.fr/) (France).

American Chemical Society:

* [Green Chemistry Educational Resources](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=1444&use_sec=false&sec_url_var=region1&__uuid=f1cefa0d-1055-4609-9f78-11a75a243f87) -links to books, online resources and downloadable activities
* [Green Chemistry Summer School 2008](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=1441&use_sec=false&sec_url_var=region1&__uuid=d84858fe-d961-4625-ae44-044b83836937) – links to presentations
* [Schools with Green Chemistry Programs](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=1440&use_sec=false&__uuid=f5bb1e95-0aa0-4412-95db-eeadfd497460)
* [Policy Statement to Promote Science & Environmental Stewardship](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=621&use_sec=false&sec_url_var=region1)
* [Statement on the Sustainability of the Chemical Enterprise](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=1906&use_sec=false&sec_url_var=region1)
* [ACS President’s Pledge Support For Sustainable Development](http://pubs.acs.org/cen/news/85/i30/8530news1.html)

Textbooks that incorporate green chemistry/sustainability topics:

* [*Chemistry in Context*](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=560&use_sec=false&sec_url_var=region1), non-majors undergraduate chemistry text published by ACS. 7th edition has new opening chapter, “Chemistry for a Sustainable World.”
* [*Chemistry for Changing Times*](http://www.pearsonhighered.com/academic/product/0,,0132280841,00+en-USS_01DBC.html)*,* non-majors undergraduate chemistry text published by Pearson/Prentice Hall

New England Green Chemistry Challenge

<http://www.epa.gov/region1/greenchemistry/>

Great Lakes Green Chemistry Network: http://www.glgc.org/

Beyond Benign ([www.beyondbenign.org](http://www.beyondbenign.org)): Their vision is to revolutionize the way chemistry is taught to better prepare students to engage with their world while connecting chemistry, human health and the environment.

## Design

* [Embedding Ecodesign and Sustainability in Mainstream Design Curriculum](http://www.ecodesigncentrewales.org/education) .

## Engineering

10xE (a.k.a Factor-Ten Engineering) is a project of Rocky Mountain Institute, which aims to help engineers, architects and their clients attack resource-intensive design problems such as manufacturing processes, buildings and vehicles using RMI's whole-system principles, in order to produce fundamentally better results. 10xE currently offers design principles and a growing set of case studies - many of them derived from Rocky Mountain Institute's experience base.

* [Factor Ten Engineering Design Principles](http://www.rmi.org/rmi/Library/2010-10_10xEPrinciples)
* Factor Ten Engineering Case Studies
  + [Autodesk AEC Headquarters and Integrated Project Design](http://www.rmi.org/rmi/Library/2010-16_AutodeskCaseStudy)
  + [Factor Ten Engineering Website](http://www.10xe.com)

American Society for Engineering Education:

* [Board of Directors Sustainability Statement](http://www.asee.org/about-us/the-organization/our-board-of-directors/asee-board-of-directors-statements/sustainable-development-education)
* [Statement of Sustainability](http://www.aashe.org/dans/documents/SustainabilityatASEE.doc)
* Engineers [Forum](http://www.asee.org/papers-and-publications/blogs-and-newsletters/engineers-forum-on-sustainability) on Sustainability

 American Society of Civil Engineers:

* [ASCE Committee on Sustainability](http://www.asce.org/PPLContent.aspx?id=7235)
* [Education for Professional Practice](http://www.asce.org/professional/educ/)
* [http://www.asce.org/sustainability/](https://mail.aacu.org/owa/redir.aspx?C=cc40bced79c44effb82c0059be4cdf6e&URL=http%3a%2f%2fwww.asce.org%2fsustainability%2f" \t "_blank)
* [Policy Statement 418 - The Role of the Civil Engineer in Sustainable Development](http://www.asce.org/Content.aspx?id=8475)
* [Civil Engineering and Sustainability Resources](http://www.asce.org/ProgramProductLine.aspx?id=7085)
* [Sustainability Resources](http://www.asce.org/PPLContent.aspx?id=30338)
* [Developing e-Learning Materials for Sustainable Construction Management](http://www.heacademy.ac.uk/projects/detail/esd_construction)
* [Sustainability in engineering educational materials database](http://www.csengin.org/library.htm)
* [Syllabi about sustainability in engineering](http://www.csengin.org/benchmark.htm)

Searchable database: [http://www.engineeringpathway.com/ep/](https://mail.aacu.org/owa/redir.aspx?C=cc40bced79c44effb82c0059be4cdf6e&URL=http%3a%2f%2fwww.engineeringpathway.com%2fep%2f" \t "_blank)

Course modules, etc.  Keyword search on “sustainability” returns many materials

## Environmental Science

David Orr. 2010. **Hope is an imperative, the essential David Orr** <http://books.google.com/books/about/Hope_Is_an_Imperative.html?id=XbZt9meH8pEC>

[Journal of Industrial Ecology](http://www3.interscience.wiley.com/journal/118902538/home)

of particular interest to those interested in life cycle assessment

## Geosciences

**InTeGrate - Opportunities for Participation and Collaboration**

InTeGrate ([http://serc.carleton.edu/integrate/index.html](https://mail.aacu.org/owa/redir.aspx?C=cc40bced79c44effb82c0059be4cdf6e&URL=http%3a%2f%2fserc.carleton.edu%2fintegrate%2findex.html" \t "_blank)) is a 5 year, community effort to improve geoscience literacy and build a workforce that is prepared to tackle environmental and resource challenges. The project includes many opportunities for participation and collaboration for geoscientists as well as those from natural science, social science and the humanities.  There are several current opportunities to join the project including suggesting module topics (and recommending authors), applying for the assessment team, and participating in one of four upcoming workshops.

**Teach the Earth**

The SERC portal for Geoscience Educators

Teaching materials, including about energy, carbon footprint, climate change, climate literacy, and public policy. Also more general approaches to teaching sustainability.

<http://serc.carleton.edu/teachearth/site_guides/sustainability.html>

## Humanities

* [A Network for Sustainable Development Education in the Humanities](http://www.heacademy.ac.uk/projects/detail/esd/esd_network_humanities)
* [ASU Institute for Humanities Research focus on Humanities and Sustainability](http://ihr.asu.edu/ihr-sustainability)

## Law

* [The Essential and Growing Role of Legal Education in Achieving Sustainability](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1471344)

## Mathematics

      Interdisciplinary approaches with math:

* [The Mathematical Association of America](http://www.maa.org/mtc/)
* [Tennessee Institute for Environmental Modeling](http://www.tiem.utk.edu/)

     Textbooks on math and the environment published by MAA:

* [Mathematical Modeling for the Environment](https://www.maa.org/EbusPPRO/Bookstore/ProductDetail/tabid/170/Default.aspx?ProductId=698) (by Charles Hadlock)
* [Environmental Math in the Classroom](https://www.maa.org/EbusPPRO/Bookstore/ProductDetail/tabid/170/ProductId/695/Subsystem/INV/ProductCode/EMC/Default.aspx) (by Ben Fusaro & Pat Kenschaft, eds.)
* [Math for the Environment](http://www.colorado.edu/math/earthmath/) (by Marty Walther)

2013 is going to be devoted to the Mathematics of Planet Earth <http://www.crm.umontreal.ca/Math2013/en/>

DIMACS website <http://dimacs.rutgers.edu/> contains lots of information related to sustainability.

## Psychology

* APA Report: [Psychological Factors Help Explain Slow Reaction to Global Warming](http://www.apa.org/releases/climate-change.html)
* [Research about influencing sustainability behaviors](http://www.psychologymatters.org/environment.html) - *Psychology Matters*
* [Teaching concepts of Sustainability](http://www.aashe.org/dans/documents/PsychologyTeacherNetworkSpring2007Newsletter.pdf): *Psychology Teacher Network Newsletter* Spring 2007 (page 21)
* [Society's Grand Challenges - Insights from Psychological Science](http://www.apa.org/science/GCBooklets.html)  
  *The Science Directorate has put together three booklets: Prolonging  
  Vitality, Global Climate Change, and Health Disparities.  Each booklet  
  describes how psychological science is already contributing and will  
  continue to play a large role in addressing each of these challenges.*
* [Sustained efforts for sustainability](http://www.apa.org/monitor/mar07/soe.html) by Dr. Cynthia Belar (APA Monitor)
* [Teaching Psychology for Sustainability: A Manual of Resources](http://www.teachgreenpsych.com/index.html)
* [International Association for Applied Psychology](http://www.psy.gu.se/iaap/envpsych.htm)
* US: [APA Division 34 Population & Environmental Psychology](http://apa34.cos.ucf.edu/)
* US: [Environmental Design Research Association](http://www.edra.org/)
* Int’l: [International Association for People-Environment Studies](http://www.iaps-association.org/)
* Int’l: [International Association of Applied Psychology, Division of Environmental Psychology](http://www.psy.gu.se/iaap/envpsych.htm)
* “This is Psychology”: Video on Climate Change from the American Psychological Association: http://www.apa.org/news/press/video/this-is-psychology/climate-change.aspx

**Psychology of Sustainable Behavior**

Tips for empowering people to take environmentally positive action

September 2009

Minnesota Pollution Control Agency

<http://www.pca.state.mn.us/index.php/component/option,com_docman/task,doc_view/gid,12949>

**Teaching Psychology for Sustainability – A Resource Manual** <http://www.teachgreenpsych.com/tg_overview.html>

**Teaching Sustainability in Introduction to Psychology from Psychology Teacher Network at the American Psychological Association** <http://www2.aashe.org/dans/documents/PsychologyTeacherNetworkSpring2007Newsletter.pdf>

**Inspiring Action: The Role of Psychology in Environmental Campaigning and Activism**. Psychologists for Social Responsibility and Friends of the Earth have released a new report of a joint workshop co-sponsored in September 2010. It explores the role that psychology -- especially the psychology of human identity -- can play in environmental and social campaigns and communications for transformative change.

http://www.psysr.org/about/programs/climate/projects/activism/

## Religion

* [AAR Focus on Sustainability](http://www.aashe.org/dans/docs/AAR_Focus_on_Sustainability.pdf)
* [AAR Board Sustainability Narrative](http://www.aashe.org/dans/docs/AAR%20Board%20Sustainability%20Narrative.doc)
* [AAR syllabus project website](http://www.aarweb.org/Programs/Syllabus_Project/default.asp)
* [Forum on Religion and Ecology](http://www.religionandecology.org/)

## Sociology

American Sociological Association:

* [Environmental Sociology](http://envirosoc.org/)
* [Graduate Programs in Environmental Sociology and Environmental Studies](http://envirosoc.org/gradprograms.php)
* [Environmental Sociology Scholarly Journals](http://envirosoc.org/journals.php)

**Social Science Library: Frontier Thinking in Sustainable Development and Human Well-Being.** A project of [The Global Development And Environment Institute (GDAE)](http://asitssgdae.ase.tufts.edu/ssl/cgi-bin/library.exe?e=p-01000-00---off-0SSL--00-1--0-10-0---0---0prompt-10---4-------0-1l--11-en-9999---20-about---00-3-1-00-0-0-11-1-0utfZz-8-00&a=p&p=GDAE)  
at Tufts University in conjunction with the UN Decade for Education for Sustainable Development. The library is found here: <http://asitssgdae.ase.tufts.edu/ssl/cgi-bin/library.exe>

# E. Sustainability Resources – General

## Books

**Cradle-to-Cradle**

William McDonough, Michael Braungart, North Point Press, 2002

**Hope is an imperative, the essential David Orr**

David Orr, 2010

Other books by David Orr: <http://www.davidworr.com/books.html>

**Our Common Journey, A Transition Toward Sustainability**

Board on Sustainable Development, Policy Division

National Research Council

NATIONAL ACADEMY PRESS, Washington, D.C.

<http://www.nap.edu/openbook.php?isbn=0309067839> (free to read online)

**Sustainability: A Comprehensive Foundation**: open source textbook by a team at a University of Illinois (November 2011) [http://cnx.org/content/col11325/latest/](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fcnx.org%2fcontent%2fcol11325%2flatest%2f" \t "_blank)

**Teaching Sustainability/Teaching Sustainably**

Edited by [Kirsten Allen Bartels](http://stylus.styluspub.com/Books/AuthorDetail.aspx?id=20666),[Kelly A. Parker](http://stylus.styluspub.com/Books/AuthorDetail.aspx?id=20667)

<http://stylus.styluspub.com/Books/BookDetail.aspx?productID=287198>

**Social Responsibility and Sustainability**

Multidisciplinary Perspectives Through Service Learning

Edited by [Tracy McDonald](http://stylus.styluspub.com/books/AuthorDetail.aspx?id=20509)

<http://stylus.styluspub.com/books/bookdetail.aspx?productid=215008>

**Govern Green: Driving your organization’s commitment to sustainability.**

**Peter A. Soyka, 2011**

Should the environment be on your board’s agenda? Yes, regardless of your organization’s mission. But “governing green” is more than simply the right thing to do. Rethinking fundamental practices that affect the environment, directly or indirectly, can improve your organization’s operational efficiency, reduce costs, raise morale, and enhance your organization’s image. Providing a step-by-step approach to create an organizational culture that supports a deep commitment to sustainability, this book suggests appropriate entry points for board involvement. It explains how to formulate a vision and strategy, develop a sustainability policy, review investments, and provide oversight. <http://www.boardsource.org/Bookstore.asp?Item=1228>

**Environmental Issues: An Introduction to Sustainability**

Robert McConnell and Daniel C. Abel, 2008 (Prentice-Hall)

## Organizations

**NSTA Position Statement on Teaching Science and Technology in the Context of Societal and Personal Issues**

<http://www.nsta.org/about/positions/societalpersonalissues.aspx>

**Association for the Advancement of Sustainability in Higher Education (AASHE)**

Working Groups, Resources, and Participating Associations

[www.aashe.org/dans](http://www.aashe.org/dans)

**American Association for the Advancement of Science (AAAS)**

[Forum on Science and Innovation for Sustainable Development](http://sustainabilityscience.org/)

An online community that facilitates information exchange and discussion among groups of individuals, institutions, and networks engaged in the field of science and technology for sustainability

[Science Careers in Sustainability](http://www.aaas.org/programs/centers/sd/careers.pdf)

[Survey of University-Based Sustainability Science Programs](http://sustainabilityscience.org/content.html?contentid=1484)

[Center for Science, Technology and Congress](http://www.aaas.org/spp/cstc/stc/)

[Climate Resources](http://www.aaas.org/news/press_room/climate_change/)

[Sustainable Development](http://www.aaas.org/programs/centers/sd/)

**Disciplinary Associations Network for Sustainability** [**http://dans.aashe.org/content/resources**](http://dans.aashe.org/content/resources)

**The National Academies**

**Our Common Journey, A Transition Toward Sustainability**

Board on Sustainable Development, Policy Division  
National Research Council

NATIONAL ACADEMY PRESS, Washington, D.C.

<http://www.nap.edu/openbook.php?isbn=0309067839> (free to read online)

The National Academies recently created the Network for Emerging Leaders in Sustainability ([NELS](http://sustainability.nationalacademies.org)), an organization for early-career professionals who are interested in building bridges with peers in DC-area agencies and organizations.  The Network includes leaders with diverse backgrounds and expertise, from natural resource management to energy policy to public health.  NELS members share a common interest in taking a multidisciplinary approach to sustainability challenges, considering the economic, environmental, social, and cultural dimensions of these problems.

Send an email to [sustainability@nas.edu](mailto:sustainability@nas.edu) to sign up for a newsletter that catalogues on a monthly basis the sustainability activities at the National Academies. Also see the main webpage at <http://sustainability.nationalacademies.org/>

**National Science Foundation**

**Toward a Science of Sustainability**

Report from Toward a Science of Sustainability Conference

Airlie Center ~ Warrenton, Virginia

November 29, 2009 – December 2, 2009 <http://www.nsf.gov/mps/dms/documents/SustainabilityWorkshop2009Report.pdf>

**Planet Forward** (<http://planetforward.org/>) is where experts and engaged citizens come together to find solutions to our shared challenges, specifically in the areas of energy, climate and sustainability.  They have created a dynamic public square, curating the best ideas and innovations from scientists, business leaders, advocates, students and government leaders. They are based at the Center for Innovative Media at the George Washington University where we engage with students and faculty from the university as well as others across the country and the world. They collaborate with a diverse group of organizations in order to bring you the best ideas and to bring them to the world.

AACC (American  Association of Community College’s) **Sustainability Education and Economic Development Resource Center**. ([www.theSeedCenter.org](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fwww.theSeedCenter.org" \t "_blank)) – has curricular materials, skills and competencies, career pathways and more.

**The Biomimicry Institute** (<http://biomimicryinstitute.org/>) promotes learning from and then emulating natural forms, processes, and ecosystems to create more sustainable and healthier human technologies and designs.

The International Research Institute in Sustainability (IRIS) invites you to discover the new website of the UNESCO supported project: **Linking Culture, Education and Sustainability: Good Practices and Experiences from Around the World**:

http://insight.glos.ac.uk/sustainability/Education/unescoculture/Pages/default.aspx

Launched in September 2010, the project aims to collect, analyse and share learning experiences that articulate cultural, socio-economic and environmental dimensions of sustainability. It was established as a contribution to the UN Decade in Education for Sustainable Development (2005-2014).

The project website offers an opportunity for policy-makers and practitioners to learn about the Culture/ESD interface as an emerging field of practise and research.It showcases a wide range of projects from across the globe, that are rich in details and innovative in terms of how they have integrated cultural diversity components in ESD.

## Journals

**Journals from the Resources page of the Disciplinary Associations Network for Sustainability:**

|  |
| --- |
| *Solutions* is a nonprofit print and online publication devoted to showcasing bold and innovative ideas for solving the world's integrated ecological, social, and economic problems. *Solutions* is a hybrid peer-reviewed journal and popular magazine – [www.thesolutionsjournal.com](http://www.thesolutionsjournal.com) |
| From AAAS, [this resource lists](http://sustainabilityscience.org/document.html?type=journal) a selection of journals that frequently cover topics of interest to the science and technology for sustainable community.  **Sustainability**  <http://www.mdpi.com/journal/sustainability>  *Sustainability*, is a international and cross-disciplinary, scholarly, Open Access journal of environmental, cultural, economic and social sustainability of human beings, which provides an advanced forum for studies related to sustainability and sustainable development. It is published by Molecular Diversity Preservation International (MDPI) online monthly.  **Sustainability: Science, Practice, & Policy** <http://ejournal.nbii.org/>  *Sustainability: Science, Practice, & Policy* (SSPP) is a peer-reviewed, open-access journal that provides a platform for the dissemination of new practices and for dialogue emerging out of the field of sustainability. The *e-Journal* fills a gap in the literature by establishing a forum for cross-disciplinary discussion of empirical science as well as practice and policy developments related to sustainability. *Sustainability* facilitates communication among scientists, practitioners, and policy makers who are investigating and shaping nature-society interactions and working towards sustainable solutions.  **Sustainability: The Journal of Record** <http://www.liebertpub.com/products/product.aspx?pid=252>  *SUSTAINABILITY:* *The Journal of Record* meets the needs of the rapidly growing community of professionals in academia, industry, policy, and government who have the responsibility and commitment to advancing one of the major imperatives of this young century.    The Journal provides the information and resources to foster collaboration, between sustainability managers, educators, corporate executives, administrators, policy makers, economists, and technology innovators who have the mandate to address and move forward the imperatives of the preservation and sustainability of global resources.  **Journal of Agriculture, Food Systems, and Community Development** <http://www.agdevjournal.com/>  The *Journal of Agriculture, Food Systems, and Community Development* is an online, international, peer-reviewed publication focused on the practice and applied research interests of agriculture and food systems development professionals and scholars.  **The Journal of Sustainable Product Design** <http://www.cfsd.org.uk/journal/>  *The Journal of Sustainable Product Design* is a peer-reviewed, multi-disciplinary journal that focuses on the theoretical,  methodological and practical dimensions of sustainable and eco-product  and service design and development. The journal is published four times each year and is supported by an international Editorial Board. The editors welcome contributions that are based on solid research, as well as ‘blue sky’ and ‘out of the box’ thinking. The journal provides a forum for leading-edge thought and new ideas.  **Journal of Sustainability Education**  <http://www.journalofsustainabilityeducation.org/>  *The Journal of Sustainability Education* serves as a forum for academics and practitioners to share, critique, and promote research, practices, and initiatives that foster the integration of economic, ecological, and social-cultural dimensions of sustainability within formal and non-formal educational contexts.  **The International Journal of Environmental, Cultural, Economic and Social Sustainability** <http://onsustainability.com/journal/>  *The International Journal of Environmental, Cultural, Economic and Social Sustainability* creates a place for the publication of papers presenting innovative theories and practices of sustainability. The journal is cross-disciplinary in its scope, a meeting point for natural and social scientists, researchers and practitioners, professionals and community representatives. *The International Journal of Environmental, Cultural, Economic and Social Sustainability* is peer-reviewed, supported by rigorous, criterion-referenced article ranking and qualitative commentary processes, ensuring that only intellectual work of significance is published.  **Journal of Sustainable Development** <http://ccsenet.org/journal/index.php/jsd/>  *Journal of Sustainable Development* (JSD) is a peer-reviewed journal, published by Canadian Center of Science and Education. The journal publishes research papers in the fields of environmental science, environmental technologies, environmental economics and policy, ecology and sustainable development. The journal is published in both printed and online versions. The online version is free access and download.  **International Journal of Sustainability in Higher Education (IJSHE)**  <http://www.emeraldinsight.com/ijshe.htm> IJSHE is the world's first fully-refereed journal on the theory and practice of sustainable development in higher education.  Since over 600 universities worldwide have committed themselves towards sustainability by signing international agreements and convention such as the Bologna Charter, The Halifax Declaration, the Talloires Declaration and the Copernicus Charter for Sustainable Development (signed to date by over 240 European universities), this journal shall be of special interest to them.  **Ecology and Society** <http://www.ecologyandsociety.org/about/policies.php#focus>  Ecology and Society is an electronic, peer-reviewed, multi-disciplinary journal devoted to the rapid dissemination of current research.  **The Electronic Journal of Sustainable Development** <http://www.ejsd.org/public/about> The Electronic Journal of Sustainable Development is a biannual, peer-reviewed journal, available online at no charge. This multidisciplinary journal, will address the issue of 'sustainable development' and how it can be achieved. It publishes scholarly articles in the realms of public policy, science, economics and the law as they relate to the concept of sustainable development and its various facets (i.e. human well-being, economic growth, environmental quality, natural resource use and management, innovation, and technological change).  **International Journal of Sustainability Communication: Research and Practice for a Sustainable Future** <http://www.ccp-online.org/en/index.php>  "International Journal of Sustainability Communication: Research and Practice for a Sustainable Future" is a peer-reviewed, multilingual e-journal for sustainability communication. IJSC – the title stands for its particular focus in the current debate on sustainable transformation processes.  The open access journal offers a communication platform for researchers and practitioners to approach strategies for urging questions regarding the future. Connecting science and practice, the editors publish scientific papers and reports of projects and initiatives. For this reason, the e-journal creates a trans- and interdisciplinary portal for social and  educational scientists, economists, media and communication scientists, and  communication practitioners (e.g. mediation, public relations, consulting,  educational institution).     **Journal of Cleaner Production** <http://www.elsevier.com/wps/find/journaldescription.cws_home/30440/description#description>  The *Journal of Cleaner Production* serves as an interdisciplinary, international forum for the exchange of information and research results on the technologies, concepts and policies designed to help ensure progress towards sustainable societies. It aims to encourage industrial innovation, new and improved products, and the implementation of new, cleaner processes, products and services. It is also designed to stimulate the development and implementation of prevention oriented governmental policies and educational programmes.   [Sustainability Accounting, Management and Policy Journal](http://listmanager.emeraldinsight.com/t/14475/3871874/3522/0/)  **Greenhouse Gas Measurement & Management**  <http://www.earthscan.co.uk/JournalsHome/GGMM/tabid/102397/Default.aspx>  *Greenhouse Gas Measurement and Management* brings together information on the application of methods and techniques to estimate, measure, account and audit greenhouse gases, with experiences on their management and control. This includes experiences in implementing market-based instruments (such as the clean development mechanism and joint implementation) to achieve emission reduction objectives at all levels.  **Community Works Journal**  <http://www.communityworksinstitute.org/cwjonline/index.html>  *Community Works Journal* is published by Community Works Institute in support of teaching practices that build community. The Journal features essays and reflections along with curriculum overviews that highlight the importance of place, service, and sustainability to a relevant and meaningful education. |

**Websites**

Sustainable Energy without the hot air: <http://www.withouthotair.com/>

Earth: The operator’s manual: <http://earththeoperatorsmanual.com/>

# F. Assessment

Boud, David & Nancy Falchikov. 2006. "[Aligning Assessment with Long-Term Learning](http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Boud+Assessment+Long-term_Learning.pdf" \t "_blank)," Assessment & Evaluation in Higher Education, v31n4 (Aug 2006): 399Ð413. [Assessment in higher education is commonly held to contribute to feedback to students on their learning and the certification of their achievement. This paper argues that this short-term focus must be balanced against a longer-term emphasis for learning-oriented assessment to foster future learning after graduation. The paper proposes that students need to become assessors within the context of participation in practice, that is, the kinds of highly contextualised learning faced in life and work. It discusses the kinds of practices that are needed to refocus assessment within higher education courses to this end.] Description from <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

Savage, R. N., Chen, K. C., & Vanasupa, L. 2007. “Integrating Project-based Learning throughout the Undergraduate Engineering Curriculum” *Journal of STEM Education: Innovations & Research*, 8(3/4), 15-27. Retrieved from EBSCO*host*.

From the Abstract: “…In the United States, the National Academy of Engineering has underscored the need for these changes and has established a center to facilitate systematic reform of engineering education… [1]. The Accreditation Board for Engineering and Technology has modified their accreditation criteria to place an emphasis on project-based learning (problem solving) and self-directed learning which supports life-long learning [2]… a common theme is to emphasize the creative elements of engineering through the integration of project-based learning (PBL) experiences. …gives students a contextual environment that makes learning relevant and focused. Solving the problem drives learning, rather than the traditional “teach by telling” lecture format…”

Segalas, J. & D. Ferrer-Balas & K.F. Mulder. 2008. "[Conceptual Maps: Measuring Learning Processes of Engineering Students Concerning Sustainable Development](http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Segalas+-Conceptual_Maps+Engg_Students+Sustainability.pdf" \t "_blank)," European Journal of Engineering Education, v33n3 (Jun 2008): 297-306. [In the 1990s, courses on sustainable development (SD) were introduced in technological universities. After some years of practice, there is increased interest in the evaluation of the most effective ways for teaching SD. This paper introduces the use of conceptual maps as a tool to measure the knowledge acquired by students when taking a Sustainability course...Moreover, the correlation between the learning outcomes the pedagogical techniques used in each course may indicate the effectiveness of the pedagogical strategies in education for sustainable development] Description from <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

Nicol, David J. & Debra Macfarlane-Dick. 2005. "[Formative Assessment and Self-regulated Learning: A Model and Seven Principles of Good Feedback Practice](http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Nicol+Formative_Learning.pdf" \t "_blank)," Studies In Higher Education, (2005). [The research on formative assessment and feedback is re-interpreted to show how these processes can help students take control of their own learning Ð i.e. become self-regulated learners. This reformulation is used to identify seven principles of good feedback practice that support self-regulation...The research underpinning each feedback principle is presented and some examples of easy-to-implement feedback strategies are briefly described. This shift in focus, whereby students are seen as having a proactive rather than a reactive role in generating and using feedback, has profound implications for the way in which teachers organise assessments and support learning.] Description from <http://phobos.ramapo.edu/~vasishth/Learning_Outcomes/Learning_Outcomes_Biblio.htm>

[**Examples of Bioregional Quizzes**](http://www.evergreen.edu/washcenter/resources/upload/Examples_of_Bioregional_Quizzes.doc)  
These bioregional quizzes can be used as they are or can inspire the creation of other quizzes at <http://www.evergreen.edu/washcenter/pResources.asp?pid=62>

Presentation on Evaluating Community Based Programs, Author: Christine Maidl Pribbenow, Wisconsin Center of Education al Research, August 2011

Website of environmental sustainability measurement tools:

<http://www.conpsychmeasures.com/CONPSYCHMeasures/areas.html#Attitudes>

**Enriching and Evaluating Sustainability Education**

Larry E. Erickson, Wendy Griswold, Keith Hohn and Oral S. Saulters

Journal of Sustainability Education

May 10, 2010

“Transformative learning theory is used together with other methods to evaluate some of the sustainability education activities.”

<http://www.jsedimensions.org/wordpress/content/enriching-and-evaluating-sustainability-education_2010_05/>

**AAC&U VALUE Rubric on Civic Engagement** <http://www.aacu.org/value/rubrics/pdf/civicengagement.pdf>

## Green/Sustainability Knowledge & Skill Statements

The goal of this U.S. Department of Education funded project is to incorporate green- and sustainability-related knowledge and skills standards into the existing National Career Clusters™ Framework. These standards followed a format used in the 2008 Knowledge and Skills Statements and represent an addendum to the statements.

<http://www.careertech.org/career-clusters/green/green.html>

**Personal & Social Responsibility Inventory**

AAC&U has partnered with the Research Institute for Studies in Education (RISE) at Iowa State University to make available to the higher education community the Personal and Social Responsibility Inventory (PSRI), a campus climate survey developed through the AAC&U initiative, *Core Commitments: Educating Students for Personal and Social Responsibility*.

<http://www.psri.hs.iastate.edu/>

# G. Audience Research, Marketing and Outreach

["Integral Communications for Sustainability"](http://s3.amazonaws.com/usp_site_uploads/resources/119/Barrett_Brown_Communicating_Sustainability_Kosmos.pdf) by Barrett Chapman Brown

Seeking to Save the Planet, With a Thesaurus by John M. Broder   
To build support for legislation, environmental marketers are literally changing the terms of the climate debate.

The American Psychological Association has published material on Shaping Pro-Environmental Behaviors: <http://www.apa.org/research/action/shaping.aspx>

**Inspiring Action: The Role of Psychology in Environmental Campaigning and Activism**. Psychologists for Social Responsibility and Friends of the Earth have released a new report of a joint workshop co-sponsored in September 2010. It explores the role that psychology -- especially the psychology of human identity -- can play in environmental and social campaigns and communications for transformative change.

http://www.psysr.org/about/programs/climate/projects/activism/

Media Strategies for Sustainability <http://sites.google.com/site/campussustainmedia/resources>

Other resources gathered by the U.S. Partnership for Education for Sustainable Development:

<http://www.uspartnership.org/main/show_passage/17>

# H. Online Toolkits

**Community Based Approach to Education for Sustainability: Developing a New Generation of Leaders Through School-Based Programs Linked to Sustainability Issues**, ed. Andrea Deri, Institute for Sustainable Communities, November 2001. <http://www.iscvt.org/who_we_are/publications/Education%20for%20Sustainability%20Guidebook.pdf>

From [www.servicelearning.org/toolkits](http://www.servicelearning.org/toolkits):

[**High Quality Instruction That Transforms: A Guide to Implementing Quality Academic Service-Learning**](http://www.servicelearning.org/library/resource/8993) (K-12)  
Bringing together resources from RMC Research, the National Service-Learning Clearinghouse, and input from educators, this guide provides the step-by-step process to creating a high quality K-12 service-learning experience as well as resources and teacher and student worksheets. Based in part on the information contained in the K-12 Service-Learning Project Planning Toolkit, this guide explores many of the Standards for Quality Practice in greater depth, and provides more examples of service-learning projects taking place in classrooms around the country.

[**Service-Learning in Community-Based Organizations: A Practical Guide to Starting and Sustaining High-Quality Programs**](http://www.servicelearning.org/library/resource/8543) (CBO)  
This guide is a first effort to apply the 2008 quality standards for service-learning in a practical guide for community-based organizations. It provides practitioners of community-based service-learning with tips, tools, and techniques they need to start making a positive difference in many people's lives by providing high-quality opportunities for youth to serve and learn.

[**Faculty Toolkit for Service-Learning in Higher Education**](http://www.servicelearning.org/library/resource/7120)(HE)  
The materials in the toolkit are divided into ten units designed to aid faculty in every step of planning, designing, and implementing service-learning programs into their curriculum and institutions as well as program evaluation and assessment. Each unit includes tips and in-depth content information about the topic presented and most units include case studies providing "real life" experiences for readers to learn from.

McMartin, Flora, Iverson, Ellen, Wolf, Alan, Morrill, Joshua, Morgan, Glenda & Cathryn Manduca. (2008). The use of online digital resources and educational digital libraries in higher education. International Journal on Digital Libraries 9:65–79

**Education for Sustainable Development Toolkit (2002)**

<http://www.esdtoolkit.org/resources/web_esd.htm>

**Sustainability Toolkit from Australian Learning and Teaching Council Limited**

http://sustainability.edu.au/resources/teaching-toolkit

# I. K-12 Resources on Sustainability

Connecting Service-Learning to the Curriculum: A Workbook for Teachers and Administrators -3rd EDITIONIncluding a NEW section on Education for Sustainability and expanded set of exemplars. A comprehensive approach to using Education for Sustainability as an overarching goal and learning focus with service-learning as the strategy.

For: K-12 Schools; Higher Education; Community Partners; Parents & Homeschoolers

In the bookstore at: [www.communityworksinstitute.org](http://www.communityworksinstitute.org/)

Sustainability Curricula - [www.facingthefuture.org](http://www.facingthefuture.org) related to state standards in math, science social studies, etc.

Project Lead the way <http://www.pltw.org/> - preparing students for problem solving of societal challenges k-12 focus but some higher education implications

Education Commission of the States – standards on civic engagement

[www.rmcresearchcorporation.com](http://www.rmcresearchcorporation.com) – Shelley Billig

Sherman, D. (2008) Sustainability, what’s the big idea? A strategy for transforming the higher education curriculum. Sustainability 1(3) 188-195.

<http://www.aashe.org/files/documents/other/WhatsTheBigIdea_Sherman.pdf>

[The Guide to Education for Sustainability](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fsustainableschoolsproject.us2.list-manage1.com%2ftrack%2fclick%3fu%3dff76ba0e81f441fedf01c58d2%26id%3d9b3a5638b3%26e%3d2af05b27e1" \t "_blank). First released in 2004, under the title The Vermont Guide to Education for Sustainability, this new version is updated to reflect the changing field of EFS and to share new strategies that we've developed over time.

[Healthy Neighborhoods/Healthy Kids Guide](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fsustainableschoolsproject.us2.list-manage2.com%2ftrack%2fclick%3fu%3dff76ba0e81f441fedf01c58d2%26id%3d3b7fd99680%26e%3d2af05b27e1" \t "_blank)This civic engagement and service-learning framework has been used across K-12 grade levels as well as community settings, and is now implemented both nationally and internationally.

[Education for Sustainability Starter Kit](https://mail.aacu.org/owa/redir.aspx?C=0f8b86a82fbf4a4093efd760345628d7&URL=http%3a%2f%2fsustainableschoolsproject.us2.list-manage.com%2ftrack%2fclick%3fu%3dff76ba0e81f441fedf01c58d2%26id%3db4e6299dc7%26e%3d2af05b27e1" \t "_blank)**.** This professional development tool prepares educators and schools to start using sustainability as an integrating theme, and to catalyze school change with efficient use of existing resources through a series of self-guided learning opportunities.

Changing Planet. NBC Learn, in partnership with the National Science Foundation, explores the impact that climate change is having on our planet. See videos here: http://www.nbclearn.com/portal/site/learn/changing-planetFor related lesson plans, check the back of each Cue Card, or visit the [**Windows to the Universe**](http://www.windows2universe.org/earth/changing_planet/changing_planet.html) project team at the National Earth Science Teachers Association.

[http://www.teachengineering.org/](https://mail.aacu.org/owa/redir.aspx?C=cc40bced79c44effb82c0059be4cdf6e&URL=http%3a%2f%2fwww.teachengineering.org%2f" \t "_blank)

Activities for engineering; generally K-12 targeted

# J. Civic, Personal, and Social Responsibility

Brown, Don “Universities and the Need to Address Global Climate Change”, March 2011, <http://rockblogs.psu.edu/climate/2011/03/universities-and-the-need-to-address-global-climate-change-across-disciplines-and-programs.html>

Colby, Anne and Thomas Ehrlich, Elizabeth Beaumont, and Jason Stephens, 2003. Educating Citizens: Preparing America’s Undergraduates for Lives of Moral and Civic Responsibility, Carnegie Foundation for the Advancement of Teaching, Jossey-Bass, San Francisco, CA.

Quotes below are from “Diversity and Democracy: Civic Learning for Shared Futures”, Associations of American Colleges and Universities, Washington DC, Vol. 14, No.1, Winter 2011

“It is important for the institutional culture to help students think about what they want to be like as individuals, as professionals in their fields, and as citizens as well as to engage them habitually in socially responsible behaviors through providing opportunities, incentives, and structures for that behavior. “ (pg. 29)   
Colby, Anne, and William M. Sullivan. 2009, “Strengthening the Foundations of Students’ Excellence, Integrity, and Social Contribution.” Liberal Education 95 (1) 22-29

“AAC&U’s Personal and Social Responsibility Inventory (PSRI)… revealed that faculty, students, academic administrators, and student affairs professionals “strongly agree” …that education for personal and social responsibility should be a major focus of college.” When counting respondents who strongly agree, the percentages were 53 to 88 percent. Including respondents who somewhat agree, the percentages “soar to a near-universal consensus (92-99 percent).”

Dey, Eric, and Associates. 2009, Civic Responsibility: What is the Campus Climate for Learning? Washington, DC: Associations of American Colleges and Universities.

Linking Colleges to Communities: Engaging the University of Community Development (2007): http://www.community-wealth.org/\_pdfs/news/recent-articles/07-07/report-linking.pdf

Resources on how students have become involved in sustainability action projects: <http://www.aashe.org/resources/general-resources-campus-sustainability/student-resources>

**College civic engagement outcomes table, broken into domains**.  
[http://activecitizen.tufts.edu/downloads/learning\_outcomes\_13.pdf](http://activecitizen.tufts.edu/downloads/learning_outcomes_13.pdf" \t "_blank)

**AAC&U VALUE Rubric on Civic Engagement**

[http://www.aacu.org/value/rubrics/pdf/civicengagement.pdf](http://www.aacu.org/value/rubrics/pdf/civicengagement.pdf" \t "_blank)

**A Brief Review of the Evidence on Civic Learning in Higher Education**

(distributed at the Association of American Colleges & Universities Annual Meeting in conjunction with the release of A Crucible Moment: College Learning & Democracy’s Future)

<http://www.aacu.org/civic_learning/crucible/documents/CivicOutcomesBrief.pdf>

**A Crucible Moment: College Learning & Democracy’s Future: A Call to Action and Report from The National Task Force on Civic Learning and Democratic Engagement**

<http://www.aacu.org/civic_learning/crucible/>

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<http://www.psri.hs.iastate.edu/>