

Math and Civic Engagement,
SENCER Summer Institute, July 31, 2015
Victor Donnay, Bryn Mawr College

References:

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- Morris Kline, The Loss of Certainty. Examines history and philosophy of mathematics and its evolution away from a way of providing certain knowledge about the world.
- David JC MacKay, Sustainable Energy – Without the Hot Air,
<http://www.withouthotair.com/> Great book that does all types of interesting calculations to model the potential for scaling up renewable energy use to a national scale. Only requires high school math.
- Jame Zull, The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning. Learning corresponds to changes in the brain - how this perspective impacts education.
- The materials from Mathematics Awareness Month 2013 – Mathematics and Sustainable are achieved and available at:
<http://www.mathaware.org/mam/2013/>
Essays at: <http://www.mathaware.org/mam/2013/essays/>
Sustainability Counts! Educational materials:
<http://www.mathaware.org/mam/2013/sustainability/>
Other Resources: <http://www.mathaware.org/mam/2013/related/>
- Sustainability Improves Student Learning (SISL),
<http://serc.carleton.edu/sisl/index.html>.
Lessons from multiple disciplines on sustainability.
<http://serc.carleton.edu/sisl/discipline.html>
- Cohen, J., Donnay, V., and Hein, C. (Fall 2012). “Multiple Layers of Participation: Working with Student Leaders in Our 360°.” Teaching and Learning Together in Higher Education, 7th issue.
<http://teachingandlearningtogether.brynmawr.edu/archived-issues/s-eventh-issue-fall-2012/multiple-layers-of-participation-working-with-stude>

[nt-leaders-in-our-360°](#).

Article discussing a cluster of three courses all focused on sustainability including my course on Math and Sustainability.

- Victor Donnay, Using Sustainability to Incorporate Service-Learning Into a Mathematics Course: A Case Study, [PRIMUS](#), Volume 23, Number 6, 1 May 2013 , pp. 519-537(19)
- Victor Donnay, Civic Engagement via Differential Equations, UMAP Journal 33.4 (2013) 387-392.
- YouTube video of Logistic Bifurcation Diagram by Jacob Bains:
<https://www.youtube.com/watch?v=ayuuqcOjBnQ>
- TED Ed Climate Change and Tipping Points video by Victor Donnay,
<http://ed.ted.com/lessons/is-our-climate-headed-for-mathematical-chaos-victor-j-donnay>
- Donnay's Math and Sustainability Summer Institute for Teachers.
All materials from this institute available free at:
<https://docs.google.com/document/d/1Ma9wYo83i10OLBf6R8WdYov0pd534n0yZbcObScYMUw/edit>

Education Related:

- How People Learn: Brain, Mind, Experience and School, Bransford, J.D., Brown, A.L., Cocking, R.R.. National Academy Press. Washington, D.C. 1999

Available on line (free), from the National Academics of Science:

http://www.nap.edu/catalog.php?record_id=6160#toc

- How Students Learn: history, mathematics, and science in the classroom, M. Suzanne Donovan and John D. Bransford, editors, National Academy Press. Washington, D.C. 2005.

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- Inside the black box: raising standards through classroom assessment, Paul Black and Dylan Wiliam, 1998. Discussion of the impact of Formative Assessment.

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<http://www.pdkintl.org/kappan/kbla9810.htm>

- Assessment for Learning, P. Black, C. Harrison, C. Lee, B. Marshall, D. Wiliam, Open University Press, 2003. See Chapter 4 for concrete ways to implement formative assessment.
- Classroom Instruction that Works: Research-based strategies for increasing student achievement. Robert J. Marzano, Debra j. Pickering, Jane E. Pollack, 2001 from Mid-continent Research for Education and Learning (McREL)

see <http://www.mcrel.org> and
www.middleweb.com/MWLresources/marzchat.html