Pathways Overview   August 2007

The Pathway partners of NSDL represent the core partnerships of the NSDL. We have used the term "NSDL Network" to refer to these multiple partnerships and library building activities that, along with existing and prior NSDL-funded projects, form and define NSDL, enabling it to serve key user audiences in multiple ways.

Pathway and Core Integration activities over the past year are bearing diverse fruits and leveraging the power of the NSDL Network in ways that enhance Pathway stewardship and help contribute to sustainability options. New partnerships and collaborations are forming, expanding opportunities for co-development. Pathway workshops offer multiple models for professional development for faculty and teachers. Pathways have achieved significant technical gains—from the release of new portals and interfaces, to collection integration, to enhancements of user services—and Pathways are exploring cross-collaboration, and the innovative uses of tools and services developed by Core Integration.

Technical advances
Every one of the Pathways have released new portals or have enhanced portal services in the past year, with the exception of ChemEd DLib (first year), who are in the process of developing a new portal that will include the JCE Dlib collections, the American Chemical Society (ACS) collections, the ChemCollective project, and chemistry materials from both NSDL and non-NSDL projects.

Engineering Pathway has implemented Community Sign On (CSO) and integrated NSDL search within their EP search results. Teachers' Domain, MatDL, and ComPADRE are nearing implementation of CSO, along with other NSDL projects like Instructional Architect and Content Clips, while BEN and Math Gateway are beginning to explore CSO requirements and implementation.

Pathways are engaged in strong collection building efforts, integrating both content and context for STEM resources, and refining infrastructure functionality and services needed to manage content, editorial review processes, and user contribution. New collection efforts include supporting effective student use of data sets (ChemEd DLib); introductory undergraduate physics and relativity (ComPADRE); community college topics and courses (AMSER). Middle School Portal publishes both Quick Takes—one page publications highlighting three to four exemplary resources for 'just-in-time' teacher help—and Explore in Depth publications that feature groupings of 20 resources in selected math and science topics, including reviews of the needed content knowledge and related ed standards. Teachers' Domain has expanded its Life and Physical Sciences Collection; is adding indigenous perspectives to selected TD resources; and has created an open access collection that permits use and reuse of resources through a grant from the Hewlett Foundation.

Pathways have contributed time and effort to the Metadata Working Group (MWG), via participation (Rachael Bower/AMSER and Marcia Matyas/BEN) as well as review, discussion, and approval of the recommendations of the MWG. AMSER is developing controlled vocabularies on key concepts in applied math and science; ChemEd DLib is developing taxonomies for general chemistry, organic chemistry, physical chemistry, and video collections.

Math Gateway has had the unfortunate experience of 'software developer failure' with a contractor, causing them to regroup. This has resulted in a re-alignment of the content and services of Math Gateway into the MathDL Pathway—a move that preserves the high quality collections of MathDL and and the services of Math Gateway, and leverages the high recognition and trust in MathDL and the Mathematical Association of American.

Partnership building / Pathway workshop*s*
One of the most successful areas of collaboration and stewardship this year has been the series of Pathway Workshops offered in collaboration with NSDL. Via supplemental funding to Core Integration from the National Science Foundation, Pathways have been able to present a wide variety of workshops that offer diverse professional development models. These workshops bear rich potential for further strengthening the NSDL Network through additional cross-collaborative workshops among multiple Pathways, and their partners, as well as 2nd tier outreach and dissemination by workshop participants. In order of occurrence:

MatDL: September 2006, National Science Foundation, Arlington, VA.
Participants: NSF Materials Research Science and Engineering Centers (MRSECs) directors and staffs, NSF program officers (Division of Materials Research and Division of Undergraduate Education). An opportunity for collaboration between NSF-funded programs; integration of research with education via NSDL and MatDL. *Outcomes:* Subsequent meetings on collaborative opportunities between MatDL and MRSECs at Cornell, MIT, Northwestern, and Princeton have taken place. MatDL has successfully encouraged and trained 25 Research Experiences for Undergraduates (REU) students at these MRSECs in the use of MatDL's Soft Matter Wiki to support their research and communicate their research results. Workshop report: http://www.nsf.gov/mps/dmr/reports.jsp
CI participants: Kaye Howe, Dean Krafft, Eileen McIlvain

Math Gateway: October 2006, Mathematical Association of American (MAA) Conference Center, Washington, DC. Two-day teacher/faculty training workshop in digital library use and NSDL, Math Gateway, MathDL
Participants: 24 college and university math faculty, some who do K12 teacher outreach
Outcomes: Eight local presentations or workshops at regional or area conferences or meetings. NSDL Core Integration supported requests for outreach materials by these workshop participants.
CI participant: Eileen McIlvain

BioSciEdNet (BEN): December 2006, BEN Scholars Program, four-day Leadership Training Institute at the American Society for Microbiology, Washington DC, to promote inquiry-based learning in higher education, and grassroots outreach for BEN, NSDL.
Participants: 21 biological sciences faculty members
Outcomes: Faculty have created learning materials, contributed these to BEN, and devised outreach plans for dissemination of their materials and for 2nd tier outreach via presentations/workshops to colleagues. BEN Scholars website: http://www.biosciednet.org/portal/about/benScholars.php
CI participants: Eileen McIlvain, Mick Khoo, Sarah Giersch

AMSER: March 2007, League for Innovation Conference (community colleges), New Orleans, LA. Three-hour training workshop in conference setting on AMSER and NSDL
Participants: 28 faculty and staff in educational settings
Outcomes: 2nd tier outreach to colleagues by participants either on their own campuses or other settings, using AMSER training materials, presentations, and evaluation materials.
CI participants: Eileen McIlvain, Robert Payo

CSERD: April 2007, Burroughs Wellcome Fund, Research Triangle Park, Durham, NC
Two-day workshop for K12 teachers and program directors to digital libraries, and the resources of CSERD, NSDL, and other Pathways: Math Gateway, BEN, ChemED DL, Engineering Pathway
Participants: 22 educators and/or Student Science Enrichment Program (SSEP) Directors or staff (other-than-school activities program)
Outcomes: request for additional workshops have been received from participants
CI participants: Eileen McIlvain, Sarah Giersch

Engineering Pathway: June 2007, American Society for Engineering Education (ASEE) 2007 Conference, Honolulu, Hawaii. Combined online and in-person workshop for educators and EP Associate Editors, in conference workshop setting; exploration of digital libraries and DL resources and services
Participants: 10 online educators; 12 in–person educators
Outcomes: Associate Editors training; good user feedback

ComPADRE: July 2007, University Corp. for Atmospheric Research Foothills Lab, Boulder, CO
Three and half day workshop for selected physics educators utilizing the physics modeling curriculum of the American Modeling Teachers Association to explore ways to develop and deliver their content via the web.
Participants: Nine physics modeling teachers
Outcomes: Participants received orientation and training in the use of a wiki as a way to organize and deliver curricular content, and explored strategies for further developing content delivery via web-based means, including strand map model.
CI participants: Eileen McIlvain, Susan Van Gundy, John Weatherley

Teachers' Domain: July 2007, WGBH, Boston, MA. NSDL/WGBH Summer Science Forum for public television representatives and educators. Introduction to TD Pathway and NSDL services.
Participants: Representatives from 13 PBS stations, paired with local educational partners they invited (district or school administrators, teachers, education specialists), 26 participants.
Outcomes: Potential for expanded partnership efforts featuring TD and NSDL with public television stations.
CI participant: Robert Payo

Honors and kudos
- Chemistry Comes Alive! Received the Pirelli *Internet*ional Award for best web-based material in chemisty, 2006.
- Shodor and CSERD's Project Interactivate were honored as recipients of the 11th Annual Webby awards by the International Academy of Digital Arts and Sciences, and Shodor received the 2006 Undergraduate Computatonal Engineering and Science Award for National Educaton Excellence at the annual SuperComputeing Conference for High Performance Computing and Networking.
- The Education Program of the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC-Education) has initiated an annual Dr. Robert M. Panoff Student Award for Explorations in Science through Computation. The program recognizes the creative use of computer-based models, simulations, and visualizations as problem-solving tools; high school, undergraduate, and graduate students.

Challenges

1. Sustainability for Pathways
   What is PW marketable value; specific skills or services? What are the lessons learned about sustainability? How does a PW's organizational structure, target audience, community relationships, DL architecture, etc. affect sustainability? What are points of leverage for CI/Management Entity to address? How can PWs sustain a PW as 'product', not 'project' – includes issues of staffing to provide marketing and end-user services; building usage and developing new services and features to engage users; improved coordination across competing project needs and deadlines; formal strategic planning
2. Evaluation – devising evaluation that effectively assesses and demonstrates impact of digital library use for teachers, and for students
3. Outreach and user education: dispel faculty misperceptions about DL use and search/discovery
4. Recognition mechanisms for faculty promotion and tenure (BEN is developing a best resources award as one way to support this, as Engineering has done with its Premier Award).