2008 NSDL Annual Meeting
Poster Abstracts

#	Category	Title	Author(s); Affiliation	Poster Abstract
1	Pathways	AMSER: The Applied Math and Science Education Repository	Rachael Bower, Edward Almasy Andrea Coffin; UW-Madison, Internet Scout Project	AMSER is the NSDL Pathways project that connects Community and Technical College users to the National Science Digital Library. Come learn about new features and applied math and science resources that were added in 2008 as well as AMSER's partnership with the Advanced Technological Education projects and centers that has resulted in the creation of ATE Central.
2	Pathways	APS Archive Collaborative: Building Tools for Library Partnerships	Marsha Matyas, Melinda Lowy, Amy Feuerstein, and Chadwick Cipiti; American Physiological Society	The American Physiological Society (APS) Archive of Teaching Resources launched in April 2002 as a venue for colleague-to-colleague sharing. Since then, the Archive has grown into a collaborative digital library with resources catalogued by APS and three partners (HAPS, SDB, and NAHSEP). All partners used a common set of review and cataloging tools. In 2008, the Archive is being redesigned with new features for partner customization, expanded partnerships, and easier user access. New administration features allow partners to customize and handle their own submissions and reviews, including automatic email notifications. New submission features include partner-specific disciplines, keywords, special fields, and customized pages. New review features include partner-specific review criteria and forms. New search functions allow database searching via keyword (all text fields and vocabulary lists), advanced search (specific partner libraries and specific vocabularies), and browse (by disciplines, learning resource type and grade level). The personalized “My Archive” retains previous functions (saving searches, saving resources to folders, sharing of folders) while also providing a listing of users’ submissions and allowing users to track submissions through the review process. The new Archive will be open to Google searches; Login for the system will be required only for submissions and “My Archive” features.

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3	Other	Beyond Penguins and Polar Bears: Integrating Science and Literacy in the K-5 Classroom	Jessica Fries-Gaither, Kimberly Lightle; Ohio State University	This poster describes a NSF-funded collaborative project between Ohio State University, the OSU Byrd Polar Research Center, Ohio Resource Center, COSI, Cornell University, and UCAR. The goal of the project is to assist elementary teachers in developing their knowledge of the polar regions and integrating science and literacy instruction through best practices. Six thematic issues of a free, professional development cyberzine (http://beyondpenguins.nsdl.org/) have been published to date. Each issue includes content knowledge, stories of polar research, lesson plans, assessment tools, and multimedia content such as images, podcasts, and digital stories. Collaboration with Content Clips has led to the development of electronic books, sets, and activities that accompany each issue. A project blog (http://expertvoices.nsdl.org/polar) is used to report on current polar news and research findings. The project uses emerging Web 2.0 tools and applications in developing the user interface and is creating an IPY Learning Objects Repository that will allow other developers to tap into a wealth of IPY resources.
4	Targeted Research	Beyond Web Metrics: Data Mining in Educational Digital Libraries	mimi recker, Bart Palmer, Utah State University; Sherry Hsi, The Exploratorium; Kevin Bacon, Hollywood	Longitudinal study of online educational resources and their use has heretofore been expensive to conduct. Because of recent advances in web usage data mining and statistics, digital libraries can track, segment, better understand, and characterize their users on a smaller budget using data that is largely already being collected within the knowledge discovery framework. These data exist in web-server logs, application databases, and third-party user tracking solutions. The focus of this poster is in the practical aspects of the kinds of data, tools, and answers that can come from educational data mining activities. The approaches will be applied to data collected from The Exploratorium and the Instructional Architect.

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5	Services	Building Locally - Linking Globally: Networking Micro-Communities of New Science and Math Teachers Using the NSDL to Advance Instructional Excellence in High Need Schools (DUE 0735011)	Elizabeth Ambos, Elizabeth Ambos, California State University (CSU) Office of the Chancellor; David Andrews and Jaime Arvizu, CSU Fresno; Laura Henriques, CSU Long Beach; Gerry Hanley and Joan Bissell, CSU Office of the Chancellor; Robert Desharnais and Paul Narguizian, CSU Los Angeles; John Ittelson and George Station, CSU Monterey Bay; Ron Hughes, CSU Bakersfield	With funding from the National Science Foundation (NSF), the California State University (CSU) has created support for networks of CSU Robert Noyce Scholars, connecting them to a variety of digital media-based learning objects, lesson plans and other support services. These small teacher networks, termed "micro-communities", are enabled through MERLOT's Institutional Teaching Commons (ITC) program, which the CSU has already established in science education and other disciplinary areas, and which is linked to the extensive collections of NSF's National Science, Engineering, and Mathematics Digital Library (NSDL). The "Build Locally, Link Globally" capabilities of the MERLOT ITC's enable Noyce Scholars and their faculty mentors to: (1) Build a select collection of online science and mathematics learning content and curriculum that is successful in high needs schools, particularly in middle and high schools; (2) Share experiences with instructional applications of NSF's NSDL resources and such tools as effective and engaging "Virtual Courseware" science simulations, designed to solve instructional problems in schools which often have no science or math equipment, supplies, labs or textbooks; (3) Link the CSU Noyce Scholars Teaching Commons to their local school district user communities, enabling Noyce Scholars to share NSDL teaching resources and pedagogy with teacher colleagues; and (4) Provide Scholars with powerful ePortfolio tools to assist them in communicating how they are able to use NSDL resources to meet the challenges of teaching in high need settings and working effectively with under-achieving students, including English Learners.

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6	Targeted Research	Building the NSDL: Reflections on the Impacts of Collaboration on Research and Development	Brandon Muramatsu, Susan Jesuroga, Jesuroga & Associates; Flora McMartin, Broad Based Knowledge; David McArthur, University of North Carolina at Chapel Hill	What are the stories of NSDL? How has NSDL been shaped by its projects & participants? The Reflections research project is collecting essays that 'tell the story' of how NSDL was formed, grew and is continuing to grow. Members of the NSDL community are providing critical analyses, commentary and reflections on what worked and equally importantly what didn't. They are also discussing how participating impacted them, their projects and NSDL. The poster session will present the first essays and commentary we have collected and posted through an Expert Voices blog. We invite the NSDL community to join us in telling your story and reflecting on building NSDL. Write an essay, review an essay or post a comment at http://nsdlreflections.wordpress.com. We'll help you get started.
7	Resource Center	CAUSEweb: A Digital Library for Statistics Instructors	Paul Fields, Dennis Pearl; CAUSE	CAUSEweb.org is a digital library for statistics instructors operated by the Consortium for the Advancement of Undergraduate Statistics Education (CAUSE). CAUSE is a national organization whose mission is to support and advance undergraduate statistics education in four target areas: • Resources, • Professional Development, • Outreach, and • Research. CAUSEweb was launched in 2004 and is now the destination of 7,000 to 9,000 unique visitors per month. CAUSEweb features a searchable annotated listing of more than 2,800 reference articles in statistics education, more than 17,500 high quality resources for teaching statistics, more than 200 fun items (cartoons, songs, jokes, quotes, poems, or videos) for free use by statistics instructors, audio and video recordings from a monthly Webinar series, a regular E-News feature, and a growing collection of refereed items providing the core of the library's holdings. CAUSEweb is a partner in the Math Gateway and the Pedagogical Services for Digital Libraries initiative. In addition, the CAUSEweb editorial board also serves as the statistics community of the Multimedia Educational Resource for Learning and Online Teaching (MERLOT).

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8	Pathways	Chemical Education Digital Library (ChemEd DL)	Jon Holmes, John W. Moore; Journal of Chemical Education	ChemEd DL, a Pathways project of NSDL, aims to provide an online library experience devoted to the teaching and learning of chemistry. In addition to providing information about chemistry education resources and tools to discover those resources, we provide social networking tools to foster community development, content management tools to organize the content of the library, and course management tools to deliver the content and assess learning in a educational setting. ChemEd DL intends to communicate chemistry in an engaging manner that provokes curiosity and excitement while at the same time providing accurate and current chemical information. ChemEd DL Textbook Tables of Contents links library content with publishers textbooks in a manner accessible to even novice learners of chemistry. Connecting the world's largest scientific professional organization, American Chemical Society, the world's premiere peer-reviewed Journal of Chemical Education, and the innovative tools of The ChemCollective, with NSDL, ChemEd DL provides its patrons a world-class digital library intent on teaching chemistry to the world.

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9	NA	CK-12: next generation textbooks	Lindsay Cazel; CK-12 Foundation	CK-12 Foundation, a non-profit organization founded in January 2007, aims to reduce the cost of textbook materials for the K-12 market both in the US and worldwide, while empowering teacher practitioners to generate their own content. Using a collaborative and web-based compilation model manifested through open resource content as an adaptive textbook, CK-12 intends to pioneer the generation and distribution of high quality, educational web texts in traditional print and online medium. The content generated by CK-12 and its community will serve as source material for a student's learning and provide an adaptive environment, scaffolding the learner's journey as he or she masters a standards-based body of knowledge, as well as passion-based learning. Initially, CK-12 has commissioned a baseline archive of STEM resources through a combination of author donations, licensing partnerships, incentives for community-based authorship, and university collaborations. CK-12 operates under the Creative Commons Attribution-Share Alike license, which grants freedom to anyone to use and reuse its core materials. Our solutions will enable all students to access and obtain an education around the globe. Collaborate with others in your area of expertise to share your knowledge with the next generation.

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10	Pathways	Computational Science Education Reference Desk	Patricia Jacobs, Robert Panoff, Dave Joiner, Scott Lathrop; Shodor	The Computational Science Education Reference Desk (CSERD), a Pathways project of the National Science Digital Library, aims to help students learn about computational science and to help teachers incorporate computational science and the use of innovative technologies into the classroom. Over the past year, CSERD has engaged key partners to leverage its computational science resources. Collaborations such as the SCXY Conference, HPC University, the Liberal Arts Computational Science Initiative, and the ECU Resources for Teaching allow it to serve a wider community of educators and students. A recent three year partnership between CSERD, SCXY, and the National Computational Science Institute (NCSI) is allowing for the review, enhancement, and creation of objects in CSERD and NSDL occurring in summer workshops and the SCXY program from 2007-2009.
11	Core Integration	Consider the Source: First Year Report	Michael Luby; Columbia University	In 2007 NSDL Core Integration embarked on a project to connect research articles, teaching, and Web 2.0 functionality in the multifaceted Library network. Two models were conceived as alternative takes on a research paper-based educational learning space. "Classic Articles in Context," to focus on landmark papers and "Timely Teaching," to address current work in "hot" areas of science. This poster will outline the project after one year's time
12	Targeted Research	Customized Math Forum	Beverly Woolf; University of Massachusetts; Stephen Weimar, The Math Forum @ Drexel	Digital libraries should not be one size-fits-all. In this research, the choice of problem and selection of hints in Math Forum was customized for individual students. The system reasoned about which problems to present, evaluated student skills and then decided which problems were ideal for each student's skill level, too difficult or too easy, based on presumed student knowledge and cognitive and learning need. The project showed that students prefer to work with the customized version of Math Forum and would return more often to this version.

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13	Services	CWIS: Turnkey Collection Development Software	Rachael Bower, Edward Almasy; UW-Madison, Internet Scout Project	CWIS is software created to assemble, organize, and share collections of data about resources which conforms to international and academic standards for metadata. CWIS was specifically created to help build collections of Science, Technology, Engineering, and Math (STEM) resources and connect them into NSF's National Science Digital Library, but can be (and is being) used for a wide variety of other purposes. Come learn about upgrades to Scout's CWIS software and the newest features and tools.
14	Other	Developing a Review Rubric for Online Educational Resources	Sarah Holsted, NSDL Core Integration; Heather Leary, Mimi Recker; Utah State University	The democratization of content creation via ubiquitous Internet tools and infrastructure (Anderson, 2006) has fueled an explosion of user-generated content in the commercial and educational markets. With the ease of creating this content, it often falls outside the usual peer review processes employed by publishers and professional societies. Funding agencies such as the National Science Foundation (NSF) are actively seeking ways to integrate teachers and learners into the education cyber-infrastructure (Computing Research Association, 2005). Accountability to different government levels for K12 education is forcing the need to identify the value and quality of online resources that are used in the classroom. The Digital Libraries go to School project at Utah State University runs professional development workshops for teachers instructing them on how to use the Instructional Architect, the National Science Digital Library, and other online content to design learning activities for their classrooms. One component of the project is to develop a measure and approach for reviewing the quality of teacher-created online learning resources. The process of creating an IA Review Rubric will be described as well as the current study using in-service teachers to test the use and feasibility of the rubric.

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15	NA	DLESE Sustainability Planning: A Model for NSDL	Mary Marlino, Tamara Sumner, Karon Kelly, and Michael Wright, Digital Learning Sciences; e-Science and NCAR Library, NCAR	For the past eight years we have been operating the Digital Library for Earth System Education (DLESE – www.dlese.org), with generous funding from the Geoscience Directorate of the National Science Foundation (NSF). Like all good things, grants from the NSF end at some point; in DLESE's case, in Fall 2007. We were tasked with developing and implementing a sustainability plan that will ensure that DLESE users will continue to have open access to the educational resources and collections in the library for the "foreseeable future." DLESE is a large, geoscience education community undertaking involving scientists, educators, and library builders from many institutions across the nation. The goal of this grassroots, community-led project is to provide searchable access to high-quality, online educational resources for K-12 and undergraduate Earth system science education (Marlino et al., 2001). As leaders of the DLESE Program Center (DPC) at the University Corporation for Atmospheric Research (UCAR), we were charged with developing and operating the library's core technical infrastructure, accessioning and maintaining collections, supporting library use in educational settings, supporting the library's community governance processes, and ensuring program continuity across the distributed technology and collection building efforts. Sustaining open access educational digital libraries, particularly those based on distributed development models, presents unique challenges and opportunities. In this poster, we will briefly describe these challenges and opportunities, and present the processes and strategies that we developed to address them. We reflect on our experiences to date to highlight which of these processes and strategies may be applicable to other digital library sustainability efforts and to NSDL in particular.

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16	Services	Engaging Afterschool Educators with NSDL from the Exploratorium	Sherry Hsi; Exploratorium	The Exploratorium in partnership with CalSAC (California School-Aged Consortium) has created and offered different professional development workshops for after school program leaders and educators using a combination of hands-on materials and online resources from NSDL. The goal of the workshop was to both introduce digital libraries as a source for STEM learning activities (especially for researching activity extensions and "Going Further" ideas) as well as prepare afterschool educators in how to do inquiry-based science and encourage creative expression with kids in after school programs. Workshop participants did not need extensive science knowledge or facilitation skills to join. Using the CalSAC trainee network, outreach specialists equipped with training and materials served as disseminators STEM learning resources from the NSDL. The outcomes of the project include a website of resources for after school audiences, a DVD of activity videos, and a partnership model for professional development and outreach to afterschool educators.

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17	Core Integration	Engaging with NSDL: Building Capacity, Supporting Practice, and Providing Outreach and Dissemination	Eileen McIlvain; National Science Digital Library (NSDL)	By leveraging collaborations among a variety of well-established education stakeholders, NSDL harnesses the technical and social aspects of the educational cyberinfrastructure it has built to empower communities, and community-driven enhancements in STEM teaching and learning. This poster features some of the tools, services, activities, and outreach opportunities available via NSDL and its community of projects--Pathways, Services, and Targeted Research: * avenues of dissemination for the outcomes and research of other NSF funded programs * audiences that can serve as testbeds for innovative resources and practices * capacity-building outreach and professional development opportunities for faculty and teachers * opportunities to integrate research in educational settings *collaborative activities supporting the adoption, implementation, and integration of educational innovations into the workflows and teaching and learning practice of undergraduate faculty and students * avenues for addressing the preparation of K12 educators
18	Pathways	Engineering Pathway: The Computing & Engineering Education Wing of NSDL	Alice M. Agogino, Joe Tront, Jackie Sullivan; UC Berkeley	The education of our future engineering workforce has never been more critical than it is today — as engineers are essential to harness the spirit of innovation to create solutions to the worldwide challenges facing people and our planet. Serving as the engineering education wing of the NSDL, the Engineering Pathway (EP) recently redesigned its website to better engage the next generation by incorporating findings and recommendations from the recent National Academy of Engineeering study, Changing the Conversation. Its new Engineering Pathway logo connotes movement and adventure — paths that provide opportunities to learn, connect, create, dream, design and do. The tagline messages encourage the use of EP resources to “shape the future” and “turn ideas into reality.” And new images, representing numerous library resources, picture diverse people engaged in myriad engineering activities. Engineering Pathway is proud to introduce its redesign in support of a more public-friendly engineering education

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				message. To support learning for broad and diverse communities, with audiences from elementary school through lifelong learners, the K-Gray Engineering Pathway provides a "one stop shopping" portal of comprehensive engineering education resources within the greater NSDL. The EP digital library provides customized pedagogical engineering information and resources for various audiences and activities. EP features include: – Targeted grade-level engineering curriculum searches tailored for K-12 teachers – Aggregation of the most significant K-12 engineering learning resources in one place – Through TeachEngineering, access to state-to-state educational content standards alignment for K-12 curricular resources – Resources for K-12 teacher professional development – Resources for teachers, counselors, parents and students to learn about becoming an engineer – Disciplinary communiy pages for all undergraduate and graduate ABET-acredited computing and engineering disciplines – Information on ABET accreditation criteria and exemplars – Best practices for teaching engineering courses in higher education – Resources and learning tools for engineering college students – Information and resources on diversifying the engineering profession – Seamless access for NSDL users through community single sign-on – Premier Award for excellence in engineering education courseware – Premier Curriculum Award for K-12 engineering – Daily events feed on engineering innovations for every day of the year – Engineering education "Today in History" blog with highlights to EP resources – Annotated textbooks with links to student and faculty educational resources in EP Stop by our exhibit booth to learn more, or visit EngineeringPathway.org

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19	Pathways	Ensemble: Enriching Communities and Collections to support Education in Computing	Richard Furuta, Lillian N. Cassel, Lois M. Delcambre, Edward A. Fox, and others; Texas A&M University	Ensemble will add a computing pathway to the existing set of NSDL Pathways, and is expected to begin development in October 2008. The computing pathway will support the full range of computing education communities, provide a base for the development of programs that blend computing with other STEM areas (e.g., X-informatics and Computing + X), and produce digital library innovations that can be propagated to other NSDL pathways. Creation of this pathway now is of great importance to computing educators. The computing communities, including computer science, computer engineering, software engineering, information science, information systems, and information technology, continue to evolve rapidly. However, production of graduates is far below the number needed to meet the projections of jobs in that sector through 2016. A focused computing pathway will address the diversity and complex interactions across the computing communities; Ensemble will provide much needed support for the many distinct yet overlapping educational programs in computing and their associated communities.
20	Pathways	HPC University	Scott Lathrop, David Joiner, Jonathan Stuart-Moore, Valerie Gartland; University of Chicago	High Performance Computing (HPC) University is a Virtual Organization of people and institutions committed to preparing knowledgeable & skilled HPC professionals, researchers, educators, and students. HPC University uses CSERD/NSDL for its infrastructure.

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21	Services	Increasing Participation in the NSDL – Transforming a Nation-wide Evaluation Instrument for Use by NSDL Pathways Projects and Collections	Glenda Morgan, Flora McMartin Ellen Iverson Josh Morrill Alan Wolf; George Mason University	We discuss the process of refining a survey instrument designed to gather information on faculty members use of digital libraries and collections. The new tool, being designed in conjunction with a number of Pathways projects will be able to be used by owners and managers of digital collections to understand their users.
22	Services	IntegraL: A Lightweight Integration System of Heterogeneous Digital Library Collections and Services	Min Song, Michael Bieber Eric Koppel; New Jersey Institute of Technology	IntegraL is a digital library system demonstrating a lightweight system integration technique for digital library collections and services. Digital library systems generally require integration with minimal or no changes to their code. IntegraL users see a totally integrated environment. They use their digital library system just as before. They also see extra link anchors. Selecting one generates a list of links to relevant meta-information (structural, content-based and knowledge-sharing relationships, and metadata). IntegraL generates the vast majority of supplemental link anchors and meta-information links automatically through the use of relationship rules. This paper presents the concept of meta-information, describes the IntegraL infrastructure and architecture supported by single sign-on authentication middleware, and explains how systems can integrate into the infrastructure. This research's primary contribution is providing a relatively straightforward, sustainable infrastructure for integrating digital library collections and services.

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23	Pathways	Isovera Digital Library	Sergey Demidenko, Cal Collins, Shakib Mostafa; Isovera	In 1999, AAAS along with 11 other professional organizations established the BiosciEdNet (BEN) Collaborative funded by NSF as an NSDL Pathway. The BEN Collaborative consists of 24 partners working together to provide an array of peer-reviewed materials to the scientific community. The BEN portal was developed to aggregate educational resources from contributing partners' digital libraries. The IsoveraDL initiative was taken to resolve the challenges most digital libraries faced: difficulty of maintenance costs, high start-up costs, insufficient metadata management, and poor peer-review systems. IsoveraDL's goal is to provide customizable digital library software that is easy to install yet robust enough to handle complex tasks in a cost effective manner. With the adaptation of IsoveraDL organizations are able to better manage their resources, provide higher quality content, and share resources seamlessly. Within the last year the focus for IsoveraDL has been shifted towards improving system performance and knowledge dissemination. Accomplished performance enhancements measures include server-side caching, database indexing, and query optimization. Wiki pages have been developed for IsoveraDL and BEN Technology. IsoveraDL Wiki contains documentation, specifications, downloads, instructions and news updates for IsoveraDL. BEN Technology Wiki contains comprehensive guides for both technical and nontechnical personnel involved with any of the BEN technology.

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24	Services	Making an Impact in the Classroom: Teacher Experience with Reviewed NSDL Resources	Francis Molina, Page Keeley, Joyce Tugel, and Ted Willard; AAAS Project 2061	To determine teacher experience with NSDL resources that we have reviewed for alignment to K-12 content standards and instructional quality, we selected a small cadre of middle school science teachers from three states (FL, LA, ME) and invited them to examine the beta version of the PRISMS web site (prisms.mmsa.org) to peruse the reviews and try out one or more of the resources. The site contains reviews of and links to resources in six categories: astronomy; biological structure and function; earth; ecology; energy, force, and motion; and matter. Teachers reported unanimously that their students responded very positively to the resources, that the resources provided strong support for their instruction, and that they would be very likely to use the PRISMS resources again in the future. They also either agreed or strongly agreed that the reviews--all accessible via nsdl.org or the PRISMS web site--were useful and that the resources were well aligned with their respective states' science curriculum standards. We plan to extend the project's accomplishments by developing a service that will train NSDL Pathways in determining the content alignment and instructional quality of selected resources using research-based criteria developed at AAAS Project 2061.
25	Pathways	MatDL: The Materials Digital Library Pathway	Laura Bartolo, Sharon C. Glotzer; Donald R. Sadoway; James A. Warren; Matthew John M. Krane; Adam C. Powell IV; Krishna Rajan; Diane Geraci; Vinod K. Tewary; Cathy S. Lowe; Kent State University	MatDL Pathway (http://matdl.org) assumes stewardship of significant content and services to support the integration of research and education in the materials community. MatDL is a consortium of organizations including: Kent State University, MIT, National Institute of Standards and Technology, University of Michigan, Purdue University, and Iowa State University, and focuses on serving materials undergraduate and graduate students, educators, and researchers. In addition to providing a Repository, MatDL offers the materials community: 1) tools to describe, manage, exchange, archive, and disseminate data among national and international government-funded materials collaborations (teams, centers, and institutes); 2) services and content for virtual labs; 3) workspace for open access development of

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				computational materials modeling and simulation tools; and 4) workspace for collaborative development of core undergraduate materials teaching resources. MatDL is expanding its collaborations across the materials community through joint efforts with the ChemCollective (CCLI Phase 2) and professional societies such as the international Minerals, Metals & Materials Society (TMS). A primary goal of MatDL is to help integrate research and education. By offering materials educators convenient access to relevant, shared learning resources based on research, both teaching and learning within materials and cognate disciplines are positively impacted.
26	Pathways	Math and Science Middle School Portal	Kimberly Lightle; Ohio State University	The NSDL Middle School Portal (http://msteacher.org) continues to evolve with new publications and functionalities. Users can still read Explore in Depth, Quick Takes, the Connecting News blog, search and browse, and register for email notification of new content in both math and science. In addition, MSP is capitalizing on Web 2.0 tools to promote interactivity, collaboration, and knowledge sharing among its users. The focus of the project is for users of MSP resources to increase their content knowledge in the areas of science, mathematics, technology, and developmentally appropriate pedagogy; easily locate and identify exemplary, standards-based resources for teaching and learning; more effectively integrate technology into their existing teaching practice; and develop an increased understanding of Web 2.0 tools and how such tools can enhance teaching and learning.

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27	Pathways	Mathematical Sciences Digital Library	Lawrence Moore; The Mathematical Association of America	The Mathematical Sciences Digital Library (MathDL) is now the Mathematics Pathway Project supported by the Mathematical Association of America (MAA). MathDL combines an earlier NSDL collections project of the same name with the earlier version of the MAA's pathway, Math Gateway. The new project features a Search over fourteen MathDL partners, daily features of Math in the News and on this day (in mathematics), and online access to award winning articles that have appeared in the MAA's three print journals. MathDL also introduces a new online publication, Loci. Loci combines three earlier MAA online publications: The Journal of Online Mathematics and its Applications, Digital Classroom Resources, and Convergence, an online magazine devoted to the use of the history of mathematics in the teaching of mathematics.
28	NA	Math Images: Using Engaging Pictures for Education	Gene Klotz; The Math Forum @ Drexel	The CCLI-funded Math Image project is building a website that features a stream of beautiful images related to math and science. Viewers click on an image to find out more about the image and the mathematics behind it—in the form of text, interactive exhibits, exchanges with experts (perhaps even the image's creator). We see the Math Image site as a source for student class projects, for example writing explanatory and pedagogical materials about the images, or creating interactive learning modules for them. The site should be a classroom resource in school and college environments. And whether on a computer lab, faculty, teacher, or home computer screen, the site may turn a student's cursory glance into real interest in the subject. Next summer, students will expand the site with more images from the vast array available, and by creating text and interactive online materials about the images. The site is based on MediaWiki software, as is Wikipedia. The Math Image Wiki will be part of the NSDL Wiki.

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29	Pathways	MicrobeLibrary.org Peer-review Model: It Takes a Village to Sustain a Digital Library	Jean Kayira, Jean Kayira and Kelly Gull, Education Department; American Society for Microbiology	MicrobeLibrary (ML) founders envisioned, "The proposed library is analogous to an electronic journal of peer-reviewed scientific articles for the research community. The ML will be an electronic journal of peer-reviewed educational resources for the teaching community." As intended, one of the underlying principles of ML is the requirement that all resources submitted to the library are subjected to peer-review. The ML has seven distinct collections which range from visual images and animations with detailed legends, classroom and laboratory exercises, newsmagazine articles, reviews of education materials and the Journal of Microbiology & Biology Education (JMBE). Collection submissions are reviewed by five editorial committees made up of standing members and ad hoc reviewers. In all, nearly 200 microbiology and biology educators volunteer as potential reviewers throughout an annual review cycle. Each ML collection has its own submission process and review criteria. Resources are reviewed for scientific accuracy and instructional value using defined rubrics created for each collection. The review process is rigorous. For example, the acceptance rate for submissions to the curriculum collection, visual collection and JMBE is 40%, 80%, and 37% respectively. However, in a departure from most review processes, ML editors work very closely and openly with authors, helping them with specific suggestions to improve their submissions and offering the opportunity for resubmission and reconsideration. At present, ML boasts of nearly 2500 peer-reviewed resources contributed to and reviewed by a community of biology educators world wide. Over 10 years later, the original founders' vision of ensuring quality resources in ML continues.

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30	Other	MicrobeWorld Public Outreach	Chris Condayan; American Society for Microbiology	The poster presents how the American Society for Microbiology leverages Web 2.0 technologies to promote the science of microbiology to the public and provided educational resources for all levels. The presentation will demonstrate the effectiveness of non-traditional public outreach through blogs, podcasts, video, websites, and RSS feeds. In 3 years the American Society for Microbiology has been recognized with numerous awards for its MicrobeWorld program.
31	Core Integration	NCore: A Framework for Semantic Digital Library Cyberinfrastructure	Carol Minton Morris, Aaron Birkland, Jim Blake, Tim Cornwell, Dean Krafft, Chris McAuliff, Lynette, Rayle; Cornell University	NCore provides a compelling suite of services and tools that allow users to blog, create wikis, harvest, search, and catalog. These features are combined with a track record of support for a large, production digital library demonstrated in the National Science Digital Library (NSDL) use case. The NCore suite serves as both a model for digital library architectures and implementations, and as an open source platform on which digital library users, developers, information managers and decision makers can build their own production systems. The NCore vision of "users as contributors" aims to power a new generation of collaborative, community-driven digital libraries that integrate with the tools, technology, infrastructure, social, information networks of the World Wide Web into the future. This poster presents NCore technology and standards and how they are used by the NSDL community.

#	Category	Title	Author(s); Affiliation	Poster Abstract
32	Pathways	New Collections on ComPADRE	Bruce Mason, Lyle Barbato Wolfgang Christian Ramon Torres-Isea Taha Mzoughi David Winch; AAPT/Univ. of Oklahoma	ComPADRE, the physics and astronomy NSDL Pathway, has developed several new resource collections over the past year. This poster describes these efforts. In collaboration with the NSF-funded Open Source Physics project, a new collection of simulation and modeling resources are now being hosted on the ComPADRE infrastructure. The Open Source resources and tools are designed to support upper division physics courses and active student learning. The Advanced Labs collection has been developed to support upper division experimental labs in physics. It includes reference articles, lab manuals, and community resource sharing. The Introductory Physics collection provides resources for the different types of college-level introductory physics courses. It makes connections to education research and between resources on similar topics. The uComp collection has been designed to promote the integration of computational physics resources into the undergraduate curriculum. The collection will include computational curricula and tools.
33	Core Integration	NSDL Collection System	Jonathan Ostwald, Katy Ginger; UCAR/Digital Learning Sciences	The NSDL Collection System (NCS) is an NCore tool to catalog and manage thematic collections of metadata within an NCore repository. The NCS supports cataloging with a full-featured metadata editor that is able to handle essentially any metadata format (including NSDL_DC), and that incorporates the CAT (Content Assignment Tool) to help catalogers assign educational standards to resources. Distributed and collaborative work is supported through configurable collection work flow processes, and through a role-based permission system. The NCS incorporates web services (for both ingest and search), as well as OAI services, enabling it to perform in a wide variety of digital library applications. Currently, the NSDL Project uses the NCS to manage collections metadata for every NSDL collection. Additionally, about 20 out of 150 plus NSDL collections are directly managed in the NDR via the NCS.

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34	Targeted Research	NSDL Curriculum Customization Service	John Weatherley, Tammy Sumner Lynne Davis Holly Devaul; Digital Learning Sciences (DLS)	The NSDL Curriculum Customization Service (CCS) brings the Science Curriculum Implementation Guides developed by the Denver Public Schools into an on-line collaborative personalization environment. The on-line space provides methods to explore the concepts, standards and learning goals in the Guides and tools to enable teachers to customize curriculum, create personalized lesson plans, and share and discover contributions made by others. The CCS incorporates NSDL education resources and is built on top of NCore components including the NSDL Collection System and the Strand Maps.
35	Services	NSDL Science Literacy Maps	Sharon Clark, John Weatherley, Sharon Clark, Faisal Ahmad, Lynne Davis, Qian-yi Gu, Tamara Sumner; NSDL/UCAR	The NSDL Science Literacy Maps are an interactive graphical interface that helps K-12 educators and learners understand the relationships between science concepts and to find associated educational resources. The interactive maps are generated through a Web 2.0 API that lets developers embed the maps in their own Web sites and display educational resources and other information in the maps. The maps illustrate learning goals for different grades, and the relationships between goals, for K-12 students across a range of science, technology, engineering, and mathematics (STEM) disciplines. New features for this year include the addition of AAAS Atlas of Science Literacy Volume II maps and student misconceptions research.
36	Other	Online Psychology Laboratory - Phase 2	Maureen McCarthy; American Psychological Association	This poster will provide information about the next phase of the Online Psychology Laboratory.

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37	Pathways	Quantitative Social Science Digital Library: Teaching Quantitative Reasoning with Social Science Data	Lynette Hoelter, John P. DeWitt (SSDAN, University of Michigan) George Alter (ICPSR, University of Michigan) William Frey (SSDAN, University of Michigan and Brookings Institution); University of Michigan	The new Quantitative Social Science Digital Library (QSSDL) will promote quantitative literacy by helping instructors to use real data in classes. The goal is to infuse quantitative reasoning throughout the social science curriculum and to bridge the gap between substantive courses and classes in methodology and statistics. Two key components of the developing pathway are the Social Science Data Analysis Network and the Online Learning Center at the Inter-university Consortium for Political and Social Research. Both of these resources provide data extracts, online analysis tools, student exercises, and other materials that help instructors integrate data from the census, opinion polls, and advanced social science surveys in their courses. The QSSDL project will provide comprehensive links to these materials and other resources promoting quantitative literacy, such as teaching modules, social science data sources, applications for statistics and mapping, and research on teaching and learning. Teaching materials will be linked to the Pedagogy in Action service at the Science Education Resource Center. The primary audience for the project will be students and faculty in disciplines such as sociology, political science, economics, geography, and social psychology. The poster describes these aims, presents illustrative teaching materials, and introduces the partners in the QSSDL project.
38	Targeted Research	Superimposing a Strand Map over a Database Lecture	Lois Delcambre, David Archer, Susan Price, Uma Murthy, Ed Fox, Lillian (Boots) Cassel; Portland State University	In an earlier project, we experimented with: (1) authoring a strand map to describe ten learning objectives (benchmarks) in a single database course topic (the topic of normalization), connecting each benchmark to relevant lecture slides and textbook material, and (3) gathering questionnaire data from five successive offerings of the database class. This poster presents our results from this preliminary study.

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39	Pathways	Teachers' Domain Pathway	Ted Sicker; WGBH Educational Foundation	Teachers' Domain, the pathway for digital media STEM resources, will highlight its latest developments, including the launch of a new infrastructure, new content collections, the College Edition, updated standards correlations, and training and dissemination efforts.
40	NA	Text Mining Educational Metadata	Anne Diekema, Steven A. Rowe, Blythe A. Bennett; Utah State University	The poster describes exploratory work that studies the use of existing standards metadata to determine standard equivalency. In other words, based on standards that have been assigned to resources we attempt to find which standards are highly correlated and might be equivalent. Equivalent standards can be used in standard crosswalks to reduce the standard assignment efforts in digital libraries and online repositories.
41	Services	The NSDL and IA go to School	mimi recker, Andrew Walker, Heather Leary, Brooke Robertshaw, Kristy Bloxham, Bart Palmer; Utah State University	The poster describes findings from an NSDL grant (0434892), aimed at helping educators integrate NSDL and Web resources into their classroom practices. Guided by a view of 'teaching as design', we have developed a flexible teacher professional development model that can be implemented within a range of workshop formats, including sustained (6-8 hours), overview (1 hour), abbreviated (4 hours), online, and train-the-trainer (TTT). Using problem-based learning, the workshop helps participants learn to use the NSDL and the Instructional Architect (IA.usu.edu; IA.nsdl.org) to increase their design capacity with online learning resources. The workshop implementations use mixed-methods, continuous evaluation to document impact of workshops on participant knowledge, behavior, and attitudes.

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42	Core Integration	The Physics Geeks Game: A 3D Mash Up of Education, Digital Libraries & Social Networking	Susan Dreher, Rob Lane; Columbia University	The Virtual Learning Worlds team, part of the NSDL's Core Integration team at Columbia University, is winding up a yearlong effort to integrate 3D virtual world technologies with educational material and digital resources to create a unique learning experience entitled Physics Geeks. Physics Geeks is a serious game designed to teach core physical science principles through authentic 3D environments and provide a gateway to related NSDL digital resources. The game will be disseminated initially through Facebook, the social networking site boasting 60 million active users. Quiz scores and geek level are displayed on a player's Facebook profile page right next to their friends', creating an incentive to score well and attain the highest levels. The final product represents a collaboration between the VLW project team at Columbia University, the comPADRE Physics pathway and Teacher's College.
43	Pathways	The Science and Math Informal Educators (SMILE) Pathway	Erin Van Rheenen, Darrell Porcello, Lawrence Hall of Science; Sherry Hsi, the Exploratorium; The Exploratorium	The Science and Math Informal Educators (SMILE) pathway is creating on online collection of STEM activities for out-of-school educators working with children from diverse backgrounds. The poster will describe the project's objectives and first-year milestones, as well as its target audiences, library architecture, and user interface. SMILE is an NSF-funded collaboration among national science museums, including UC Berkeley's Lawrence Hall of Science, the Exploratorium, New York Hall of Science, Science Museum of Minnesota, and Children's Museum of Houston.

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44	Services	Using Animal Sounds and Videos to Teach Physics: a Collaborative Curriculum Development Effort	Colleen McLinn; Cornell Lab of Ornithology, Macaulay Library	As part of outreach efforts for Macaulay Library's digital library of animal behavior, Cornell Lab of Ornithology scientists have partnered with New York State teachers to develop K-12 lessons integrating physics and biology. Since 2006, teacher-researcher teams have been developing, testing, and implementing modules that use cutting-edge questions about animal behavior to teach standards about sound, light, and motion. The goals are to broaden participation in physics, develop new models of collaboration between education specialists and science content specialists, and increase the educational value and usage of our digital library. We report on strategies for using rich media at different stages of the inquiry cycle, and lessons learned from involving teachers as content creators.
45	Services	Web Publishing with Content Clips	Lois McLean, Rick Tessman; McLean Media	Content Clips is a free online service for organizing and adding context to multimedia resources from distributed digital libraries (http://www.contentclips.com). The system architecture supports a variety of media formats including images, audio, video, text, and Flash. The public Content Clips resource collection includes both individual clips and aggregated sets and activities. Registered users also can create and save their own personal sets and activities and add clips from other sites. The system framework now supports new applications that can bypass the login requirement and allow access to resources via a guest link. This poster will show how teachers can use the Content Clips service and how two NSF projects are taking advantage of its system features for web publishing applications. In one case, McLean Media is building STEM Stories, a free digital collection that tells the personal stories of women scientists, past and present (Research on Gender in Science and Engineering). Team members from the Beyond Penguins and Polar Bears ezine for elementary teachers are also collaborating with McLean Media to assemble multimedia resources for each monthly issue (http://beyondpenguins.nsdl.org).

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46	Services	Enhancing the ChemEd DL with a Wikihyperglossary	Robert Belford; University of Arkansas at Little Rock; John Moore, Dan Berleant, Jon Holmes, Michael Bauer, Shane Sullivan and Kyle Yancey	The goal of this project is to create a Wikihyperglossary (WHG) for the Chemical Education Digital Library (ChemEd DL). The WHG design we base this project on automates the markup of digital text documents and web pages by linking words within the document to semantically useful content in the ChemEd DL. Submitted documents are processed through server side scripting that returns a marked up document with links to the records associated with the terms in the glossary database. The content of these records may be textual or multimedia and through AJAX (Asynchronous JavaScript and XML) is returned to the user without ever leaving the marked up document. By varying read/write permissions of the individual record fields some of them can be collaboratively developed over the internet (wiki-fields) while others can extract information and multimedia digital objects from the ChemEd DL, or other external online information resources. The WHG also connects every word or sequence of words in the document to a search engine through a JavaScript Automated Search (JAS) process which can be modified by both clients and administrators. A client side MyWHG interface is being developed that will allow the public to decide which components of the ChemEd DL will be connected to a document. We will present a prototype WHG, our vision of how it will be integrated with the ChemEd DL and how it will benefit teachers, students and online seekers of information in general.

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47	Services	MAISON: Middleware for Accessible Information Spaces on NSDL	K. S. Candan, H. Sundaram, H. Davulcu, M.L. Sapino, T. Hedgpeth,S.Toufeeq Ahmed, Mike Blazer, Mijung Kim, Shruti Gaur, Hardik Doshi, Vishal Shah, J.W. Kim; Arizona State University	The principal motivation of this project is to improve participation to NSDL (National Science Digital Library) by teachers, librarians, and learners who are blind. The Middleware for Accessible Information Spaces on NSDL (MAISON) will enhance the accessibility of NSDL, its internal and external resources existing services (such as strand maps of educational benchmarks), and community tools (such as bogs, wikis and RSS news feeds). This poster focusses on the design of the CSIP-A service architecture for serving accessible strand maps.