The National SMET Education Digital Library (NSDL) Program

Joint Workshop on “Strengthening the Public Information Infrastructure for Science”

April 18, 2001
NIST, Gaithersburg, MD
Context

- ~4000 institutions of higher education (two-year, baccalaureate, comprehensive, doctoral)
- ~16,000 local school districts
- Public, private, for profit
- Continuing education needs
Programmatic History

NSDL Program
NSF: FY 00-02

DLs & UG Earth Systems Education
initiated FY 99, continuing

DLI 2 Special Emphasis
in UG Education FY 98-99

DLI 2 - NSF, et al., initiated in FY 98, continuing

Digital Libraries Initiative (DLI 1) - NSF/NASA/ARPA, FY 94-97

DL Operational Fall, 2002
Background Reports

- Information Technology: Its Impact on Undergraduate Education in Science, Mathematics, Engineering, and Technology (NSF 98-82), April 18-20, 1996
- Developing a Digital National Library for Undergraduate Science, Mathematics, Engineering, and Technology Education, NRC workshop, August 7-8, 1997
- Serving the Needs of Pre-College Science and Mathematics Education: Impact of a Digital National Library on Teacher Education and Practice, NRC workshop, September 24-25, 1998
- Digital Libraries and Education Working Meeting, January 4-6, 1999
- Portal to the Future: A Digital Library for Earth System Education, workshop report, August 8-11, 1999
- The Digital Libraries Initiative: Update and Discussion, ASIS Bulletin, October, 1999
Working Assumptions

- The WWW is the primary medium (for now)
- Content is a mix of “born digital” and analog
- There is no lack of “great piles of ‘stuff’ ”
- There is a need for “piles of great ‘stuff’ ”
- The “unit” of content can and will shrink
- Users will increasingly be creators, and vice versa
- While much of the use will be “free”, there is a need to explore multiple models of sustainability
Vision

A Learning Environments and Resources Network for SMET Education (LEARNS)

• Designed to meet the needs of learners, in both individual and collaborative settings
• Constructed to enable dynamic use of a broad array of materials for learning, primarily in digital format
• Managed actively to promote reliable anytime - anywhere access to quality collections and services, available both within and without the network
“The network is the library.”
LEARNS Connects:

**Users:** students, educators, life-long learners

**Content:** structured learning materials; large real-time or archived datasets; audio, images, animations; primary sources; digital learning objects (e.g. applets); interactive (virtual, remote) laboratories; ...

**Tools:** search; refer; validate; integrate; create; customize; publish; share; notify; collaborate; ...
LEARNS Supports:

Learning communities
Users (profiles)

Customizable collections
Content (metadata)

Application services
Tools (protocols)
LEARNS Enables:

Environments for
• Communication
• Collaboration
• Creation
• Validation
• Evaluation
• Recognition
• ...

AND

• Discovery
• Stability
• Reliability
• Reusability
• Interoperabilityability
• Customizabilityability
• ...

of Resources
NSDL Program Information

- 29 awards in FY00 - abstracts available online
- ~13 awards from FY98, FY99 precursor to NSDL

- Anticipated deadlines: April 2002
- [due-nsdl-program@nsf.gov](mailto:due-nsdl-program@nsf.gov) (contact point)
Overview of FY00 Projects

- 90 proposals requesting ~ $59 M
- 29 projects ~ $14 M
- 6 Core Integration pilot projects
- 13 Collections track projects
- 9 Services track projects
- 1 Targeted Research track project
Overview continued

- Current domains: engineering, life sciences, geosciences, mathematics
- Professional societies involved
- Nascent private sector involvement
- Nascent publisher involvement
Overview continued

• Several formal collaborative projects (more born at PI mtg!)
• All feature multiple PIs
• 11 with explicit K-12 linkages
• 6 with strong potential K-12 links
• Heading towards pre-K to Gray
Nurturing

- Initial PI meeting, 9/22-24/2000
- Collective identity, self-governance
- Working groups formed and a coordinating committee
- Working groups convened 11/1-2
- Tech. infrastructure group meets soon
- IP/Sustainability workshop planned
Issues/Questions

• In what ways will this resource be of value to constituent institutions?
• In what ways can we improve the value of this resource?
• In what ways might this virtual facility become a sustainable resource?
Issues/Questions cont.

• New role for and relationship between librarians and faculty
• Implications for K-12 sector?
• Implications museums and other informal learning venues?
• Implications for graduate programs?
Issues/Questions cont.

• What about non-science, mathematics, engineering, and technology domains?

• International collaborations
International dimensions

• DLI2 has begun international pgm.
• JISC/UK, DFG
• EU, Brazil, Hungary, Korea, Singapore, Finland, Japan, Australia, ...

• ISDL??
Issues/Questions cont.

• Intellectual property

• Federal inter-agency coordination and collaboration
e-Government Project
Governmental Affairs Committee
Senators Lieberman and Thompson

http://www.senate.gov/~gov_affairs/egov/

See entry on “Citizen Services” menu for: Online National Library
Web-based Education Commission

http://www.hpcnet.org/webcommission

- Congressionally established
- Report recently published
- http://www.webcommission.org/report
Expectations of NSDL Program Tracks

- **Core Integration**: to coordinate a distributed alliance of resource collection and service providers, and to ensure reliable and extensible access to and usability of the resulting network of learning environments and resources
- **Collections**: to aggregate and actively manage a subset of the digital library’s content within a coherent theme or specialty
- **Services**: to increase the impact, reach, efficiency, and value of the digital library in its fully operational form
- **Targeted (Applied) Research**: to have immediate impact on one or more of the other three tracks
Core Integration System

• Maintain the premier gateway to the network;
• Supplement and coordinate services developed to enable effective use of and access to the network’s content;
• Provide leadership in the development of standards for including resource collections and services in the network;
• Work with resource collection providers to establish a suite of review systems for inclusion of material;
• Coordinate the formulation of requirements – in conjunction with appropriate standards organizations and/or consortia – for interoperability, reusability, reliability, and stability of resources and services;
• Seek out new resource collections to join fully, or otherwise be affiliated with, the library
Collections

- Discovery of content
- Classification and cataloguing
- Acquisition and/or linking; referencing
- Disciplinary-based themes define a natural body of content, but other possibilities are also encouraged
- Access to massive real-time or archived datasets
- Software tool suites for analysis, modeling, simulation, or visualization
- Reviewed commentary on learning materials and pedagogy
Services

• Help services, frequently asked questions, etc.
• Synchronous/asynchronous collaborative learning environments using shared resources
• Mechanisms for building personal annotated digital information spaces
• Reliability testing for applets or other digital learning objects
• Audio, image, and video search capability
• Metadata system translation
• Community feedback mechanisms
Targeted Research

- Digital library usage studies
- Building and sustaining user communities
- Automated annotation of audio, image, or video resources
- Applications of simulation or virtual world technology for virtual assistants
- User interface construction and implementation
Recent papers

- “Growing a National Learning Environments and Resources Network for Science, Mathematics, Engineering, and Technology Education: Current Issues and Opportunities for the NSDL Program”, http://www.dlib.org/dlib/march01/zia/03zia.html