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The National SMET Education Digital Library (NSDL) Program

Joint Workshop on

"Strengthening the Public Information Infrastructure for Science"

April 18, 2001

NIST, Gaithersburg, MD

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Context

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

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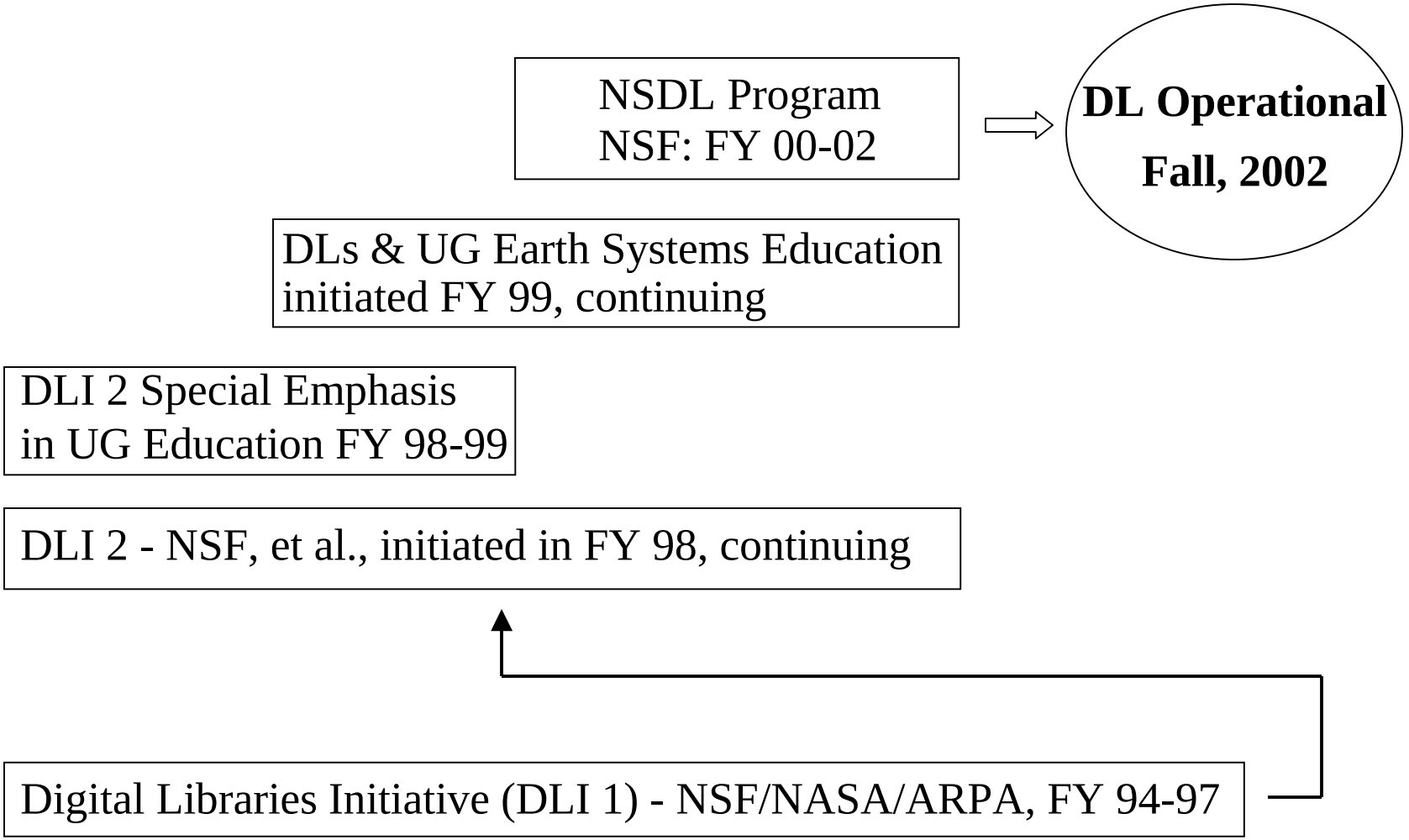
Programmatic History



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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
- *Report of the SMETE Library Workshop* (NSF 99-112), July 21-23, 1998
- *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

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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

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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

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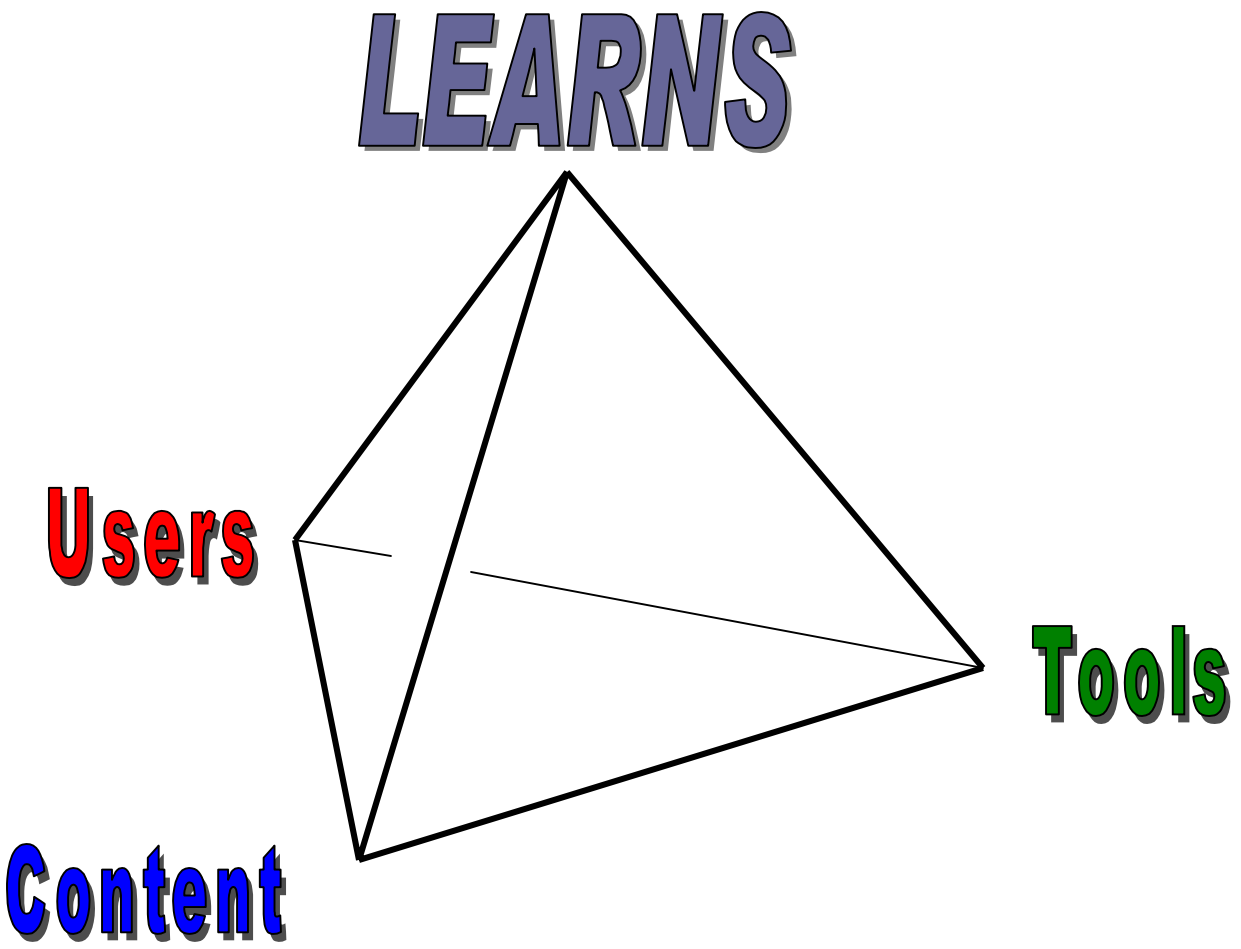

“The network is the library.”

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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; ...

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LEARNS Supports:

Learning communities

Users
(profiles)

Application services

Tools
(protocols)

Customizable collections

Content
(metadata)

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LEARNS Enables:

Environments for

- Communication
- Collaboration
- Creation
- Validation
- Evaluation
- Recognition
- ...

AND

- Discovery
- Stability
- Reliability
- Reusability
- Interoperability
- Customizability
- ...

of Resources

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NSDL Program Information

- **http://www.ehr.nsf.gov/EHR/DUE/programs/nsdl/** (links to background reports and related projects)
- 29 awards in FY00 - abstracts available online
- ~13 awards from FY98, FY99 precursor to NSDL

- *Anticipated deadlines: April 2002*
- ***due-nsdl-program@nsf.gov*** (contact point)

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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

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Overview continued

- Current domains: engineering, life sciences, geosciences, mathematics

- Professional societies involved
- Nascent private sector involvement
- Nascent publisher involvement

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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

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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

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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?

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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?

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Issues/Questions cont.

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

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International dimensions

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

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Issues/Questions cont.

- Intellectual property
- Federal inter-agency coordination and collaboration

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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

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Web-based Education Commission

http://www.hpcnet.org/webcommission

- Congressionally established
- Report recently published
- http://www.webcommission.org/report

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Expectations of NSDL ProgramTracks

- *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

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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

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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

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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

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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

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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

- *"The NSF National Science, Mathematics, Engineering, and Technology Education Digital Library (NSDL) Program: A Progress Report"*, http://www.dlib.org/dlib/october00/zia/10zia.html