

Progress Report
Fall 2000–Summer 2003

NSDL

THE NATIONAL SCIENCE DIGITAL LIBRARY





Special thanks to the NSDL Educational Impact and Evaluation Committee, chaired by Tamara Sumner and Sarah Giersch. Working closely with the Core Integration team, and using NSDL usage and study data collected over the past two years, the Educational Impact and Evaluation Committee contributed valuable time and expertise to the development of this first NSDL Progress Report.

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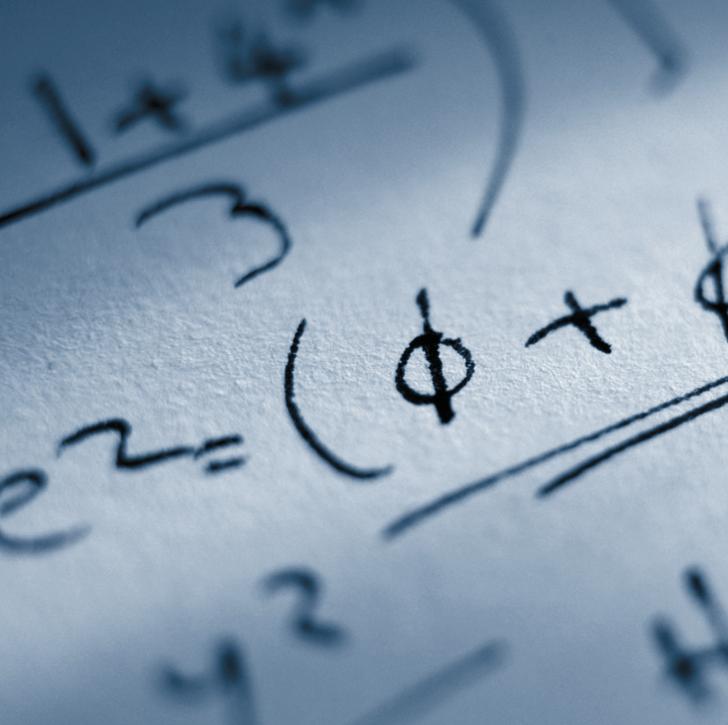
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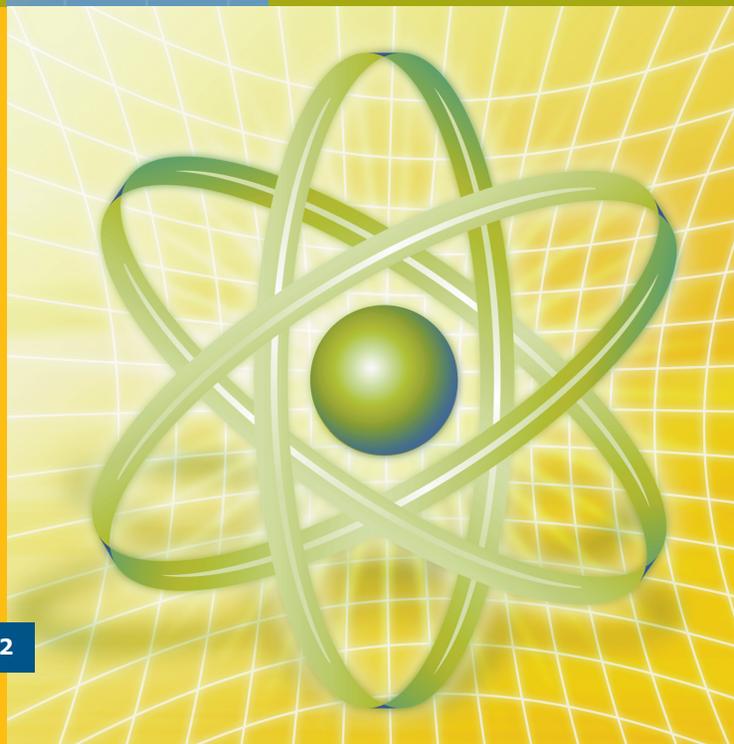
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NSDL will encourage and sustain continual improvements in the quality of STEM education for all students, and serve as a resource for lifelong learning.

—Lee Zia, NSDL Program Officer,
National Science Foundation





About NSDL

The National Science Foundation (NSF) established the National Science Digital Library (NSDL) to catalyze and support continual improvement in the quality of science, technology, engineering, and mathematics (STEM) education. Developed through a cooperative effort of educators, scientists, and content providers, NSDL is envisioned as one of the most comprehensive digital educational networks in the world. Ultimately, NSDL will serve students and teachers at all levels in individual and collaborative settings, and it will function as a center of innovation for digital libraries in the context of learning and science education.



NSDL History

In September 2000, the National Commission on Mathematics and Science Teaching for the 21st Century released its report, *Before It's Too Late: A Report to the Nation*. The commission had been asked to “investigate and report on the quality of mathematics and science teaching in the nation.”

Chaired by Senator John Glenn of Ohio, the commission identified a “pressing national need for high-quality teaching,” which “demands a vigorous, national response that unifies the efforts of all stakeholders in mathematics and science education.” As one of its action strategies, the Glenn Report recommended that

. . . a dedicated Internet portal must be available to teachers so that they can make use of and contribute to an ever-expanding knowledge base about mathematics and science teaching.



Five years earlier, Lee Zia, who was to become the NSDL program officer, noted that most new NSF proposals planned to disseminate project results through web sites. Wanting to capture, organize, and preserve NSF-sponsored resources, he recognized the potential of high-quality content whose value derives, in part, from the hyper- and multimedia environment in which it is delivered.

Building on work supported under the multi-agency Digital Libraries Initiative (DLI), NSF developed the National STEM Education Digital Library program in 1996. The program was conceived as an online network of learning environments and resources for STEM education at all levels. In January 2000, the NSF Directorate for Education and Human Resources' Division of Undergraduate Education issued the first request for proposals to the NSDL program, which focused on four areas: core integration, collections, services, and targeted research.

NSDL Program—Four Areas of Focus



After NSF awarded the first forty-two NSDL grants in fall 2000, a community of researchers, developers, and teachers formed to produce the white paper *Pathways to Progress*, which observed,

The NSDL effort has emerged from the confluence of technological advances, changing educational practice, and a recognition of the fundamental importance of [STEM] education to our highly technological society.

NSDL addresses key objectives of the Glenn Report and continues to catalyze and support continual improvements in the quality of STEM education.

Milestones in NSDL Development

1998

More than seventy researchers, educators, and digital library experts attend the Science, Mathematics, Engineering, and Technology Education Library Workshop held at NSF to explore the idea of a national digital library for undergraduate science, technology, engineering, and mathematics education. The workshop report contains general background information on digital libraries.

1997

Developing a Digital National Library for Undergraduate Science, Mathematics, Engineering, and Technology Education: A Report of a National Research Council Workshop is issued, reiterating the need for a national electronic library for validating and disseminating successful educational practices.

1999

The Digital Libraries and Education Working Meeting is held at NSF, bringing together leaders from selected DLI Phase I Initiative projects, projects funded under DLI Phase II as planning testbeds for applications to undergraduate education, and other projects related to digital libraries and education.

2000

The National Commission on Mathematics and Science Teaching for the 21st Century issues *Before It's Too Late: A Report to the Nation* in September, which recommends a dedicated Internet portal to support mathematics and science teaching.

During the NSDL Program Grantees Meeting (the precursor to the NSDL Annual Meeting) held at NSF headquarters in Arlington, Virginia, new NSDL grantees from more than twenty-five projects nationwide meet for the first time and exchange information about their work. Key issues and priorities are established, and the process for establishing a shared governance structure is launched.

The *NSDL Whiteboard Report*, an e-mail exchange of research news and notes from the NSDL community, begins regular monthly publication.

2001

Pathways to Progress is issued. This collaborative white paper, written by the NSDL community, describes a shared vision for the initial version of NSDL.

The NSDL Annual Meeting 2001 is held in Washington, D.C., bringing together additional new projects and launching several demonstration digital libraries. An interim governance model is established.

2002

Representatives from more than a hundred funded NSDL projects are on hand to celebrate the initial public launch of NSDL.org on December 2 at the NSDL Annual Meeting 2002 in Washington, D.C.

2003

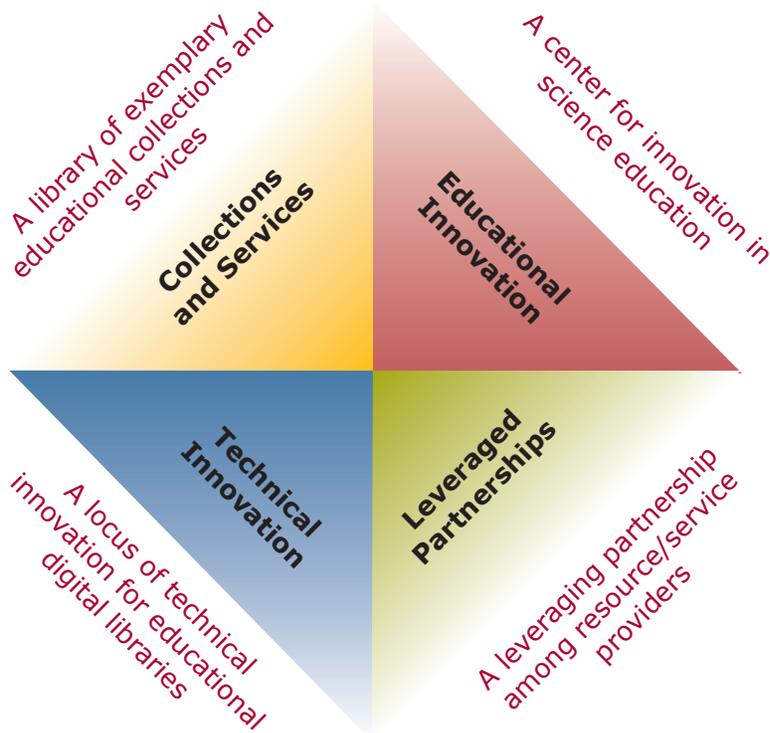
The Educational Impact and Evaluation Committee, in collaboration with the Core Integration team, leads the effort to publish this first NSDL Progress Report.

Priorities for 2002–2003

NSDL's efforts to enhance STEM education can be organized around four broad interdependent areas: Collections and Services, Technical Innovation, Educational Innovation, and Leveraged Partnerships (Figure 1). The strategies and goals inherent in each area define a framework for determining annual priorities as NSDL's focus transitions from establishing the library's initial infrastructure and public presence, to being a responsive resource partner addressing the needs of STEM educators and learners in meaningful ways.

The earliest phases of the NSDL initiative culminated in the initial release of a limited-in-scope but fully functional digital library in December 2002. Its content exceeded 200,000 items, drawn from more than two dozen collections. Preparing for this release dominated much of the 2002 effort. Priorities for 2003 and beyond amplify earlier ones in important ways.

Figure 1: Framework for NSDL Priorities



Collections and Services

Efforts in 2002 focused on assembling a significant amount of educationally useful content, presenting users with accurate characterizations of content, and identifying and highlighting the partners who provide these resources.

The 2003 priority is to begin gaining additional depth and breadth under an explicit collections-development policy. This policy will combine analysis of needs and gaps (based on a phased targeting of specific audiences) with a strategy for capitalizing on opportunities, especially on resources developed by recipients of NSDL grants and by partner libraries.

Technical Innovation

In 2002, the primary technical focus was on integrating collections being developed by NSDL partners. A metadata repository (see page 10) was created, composed of rich descriptions of collections and individual resources in the library.

The 2003 priorities focus on developing a framework for integrating library services provided by NSDL partners. The technical priorities for NSDL recognize that the library increasingly will be an aggregation both of individual collections and of other full-fledged digital libraries that serve targeted audiences with specialized collections and services.

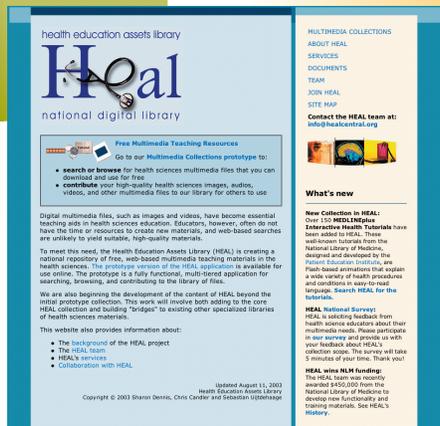
Educational Innovation

Much of the education-oriented effort in 2002 was provided by individual NSDL projects, which exhibited great diversity in disciplines covered, learning contexts, and types of information included, such as

- Gender & Science Digital Library (GSDL) www.gsdli.org
- Health Education Assets Library (HEAL) www.healcentral.org
- The Math Forum www.mathforum.org



GSDL is a cutting-edge project from the Gender & Diversities Institute at The Education Development Center, Inc. In conjunction with the Eisenhower National Clearinghouse, GSDL makes available to users a variety of materials that support equitable learning.



HEAL provides educators with high-quality and free multimedia materials (such as images and videos) to augment health sciences education.



The Math Forum is a leading center for mathematics and mathematics education on the Internet. Math Forum resources, materials, activities, person-to-person interactions, and educational products and services enrich and support teaching and learning in an increasingly technological world.

Educational Innovation (Continued)

Priorities for 2003 emphasize building coordinated relationships between NSDL and organizations that are leading change and innovation in STEM education at various levels. Efforts to support educators will include workshops, CD-ROMs, and other methods that model strategies for integrating NSDL resources into effective pedagogic practice, as well as the creation and dissemination of high-quality communications materials that share NSDL's vision. Leveraging the diversity of the growing NSDL community to increase audience awareness, engagement, and impact will also be of primary importance in the upcoming year.

Leveraged Partnerships

Strong mutually beneficial partnerships within NSDL, and between the library and other entities concerned with STEM education, are vital to the success of NSDL building and implementation. Priorities for 2002 included an emphasis on supporting the 118 NSDL funded projects to enable communication, community-based decision making, and resource sharing. Other efforts focused on cultivating partnerships with the education community and scientific professional societies, as well as commercial content providers such as publishers, software companies, and scientific instrument manufacturers.

Continuing to facilitate collaboration and communication among all NSDL partners is a major priority in 2003. Key areas of community contribution will include developing strategies for sustainability and evaluation that promote an organizational culture centered on NSDL users and their needs.

