NSDL

THE NATIONAL SCIENCE DIGITAL LIBRARY

2010 Collections Assessment: What's In NSDL???

Library Scope and Goals

Library scope: support teaching and learning of STEM concepts, and research on STEM learning

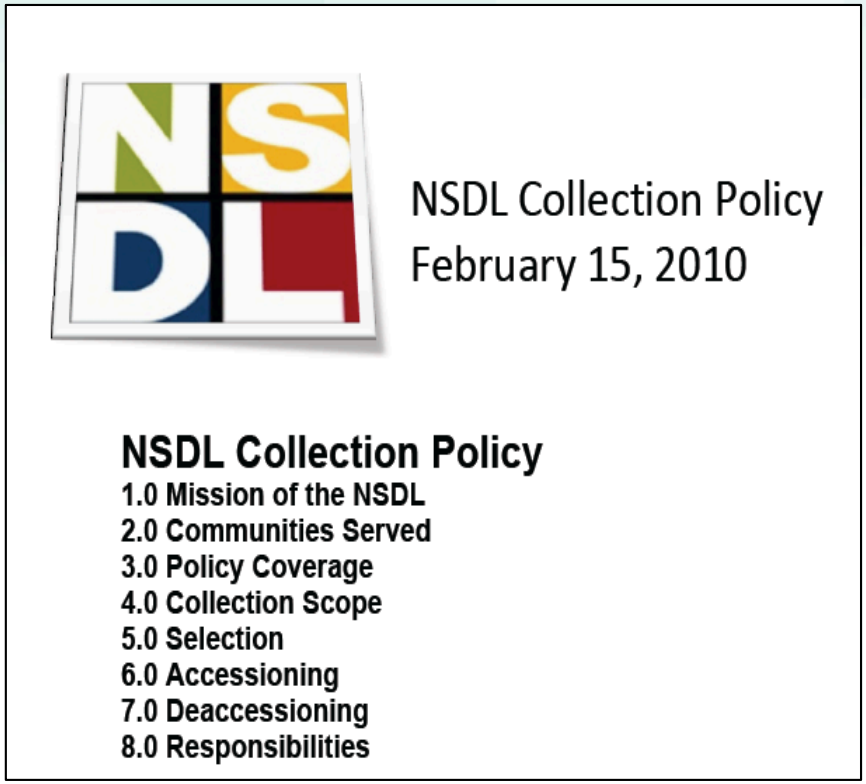
Goal: provide access to materials that foster demonstrable educational impact on:

- Learning called for in educational standards and initiatives
- Learning on a topic of societal importance
- Mastering of foundational STEM skills and concepts
- Understanding of linkages and interactions among or within STEM disciplines, or between STEM and other disciplines

Bioethics Classroom Debate
@2010 WGBH Educational Foundation

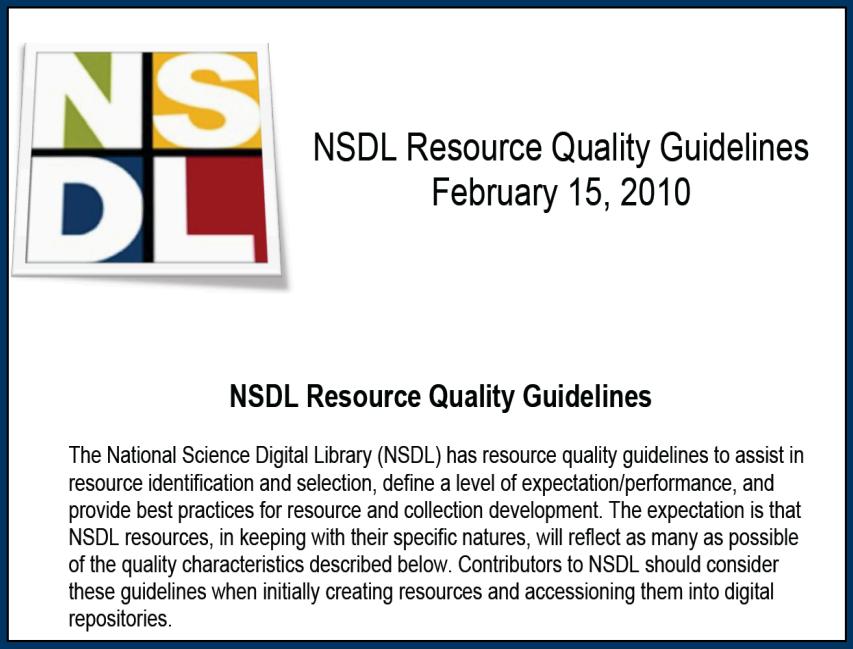
NSDL Collection Policy Activity

- NSDL Collection Policy updated
- NSDL Resource Quality Guidelines updated
- NSDL Accessioning Board (NAB) established



NSDL Resource Quality Guidelines

1. The Resource is scientifically accurate
2. The origin of the resource is attributed
3. The resource is robust, functional and accessible
4. The resource has complete documentation, including:
   - 4.1. Reference documentation,
   - 4.2. Educational documentation,
   - 4.3. Rights and use documentation,
   - 4.4. Technical documentation,
   - 4.5. Data documentation
   - 4.6 Model and simulation documentation.
5. The resource is pedagogically effective
6. The resource is easy to use for educators and learners
7. The resource is free of distracting or off-topic advertising



NSDL Resource Quality Guidelines
February 15, 2010

NSDL Resource Quality Guidelines

The National Science Digital Library (NSDL) has resource quality guidelines to assist in resource identification and selection, define a level of expectation/performance, and provide best practices for resource and collection development. The expectation is that NSDL resources, in keeping with their specific natures, will reflect as many as possible of the quality characteristics described below. Contributors to NSDL should consider these guidelines when initially creating resources and accessioning them into digital repositories.

- **The refocusing of the library scope and goals resulted in the 2009 de-accessioning of over 2 million items**

Library Size

month	# of managed resources	# of collections	# of new collections
Sep 1, 2010	131,342	121	3
May 1, 2010	125,083	117	0
Dec 1, 2009	120,919	114	1
Nov 1, 2009	115,692	113	0
Oct 1, 2009	118,835	114	1
Sep 1, 2009	153,725	131	2
Library Refocus and De-accessioning Begins			
Aug 1, 2009	1,657,659	160	2
July 1, 2009	2,186,256	170	2

Results on the Collection

- 2.1 million individual resource URLs (not metadata records) decreased to 115,692 URLs, a 95% change
- NSDL collections declined from 170 to 113
- NSF-funded Pathways resources grew to 56% of the library, a change from 2.74% of the library

Results on Search Returns

- NSDL Pathway resource returns more than doubled (27% to 71%)
- Results not accessible dropped (45% to 8%)
- Results returning only a metadata record and not directly linked to a resource decreased by half

Effect on Ed Level Resource Returns

- Undergraduate level returns rose slightly
- Graduate level returns decreased threefold
- High, middle and elementary school returns tripled
- General public and informal education doubled

Effect on Resource Type Returns

- Learning resources, datasets, pedagogical, and educational standards all doubled
- Animations, videos, visualizations almost quadrupled
- Articles, journals, books, abstracts, conference proceedings decreased by 38%
- University, corporate pages, lists of links increased by 50%*

- *this was a surprise, showing that granularity of resources must be improved, as top level resources do not support direct learning, per se, but can contain learning resources deeper in the website.

Collection Contributors:

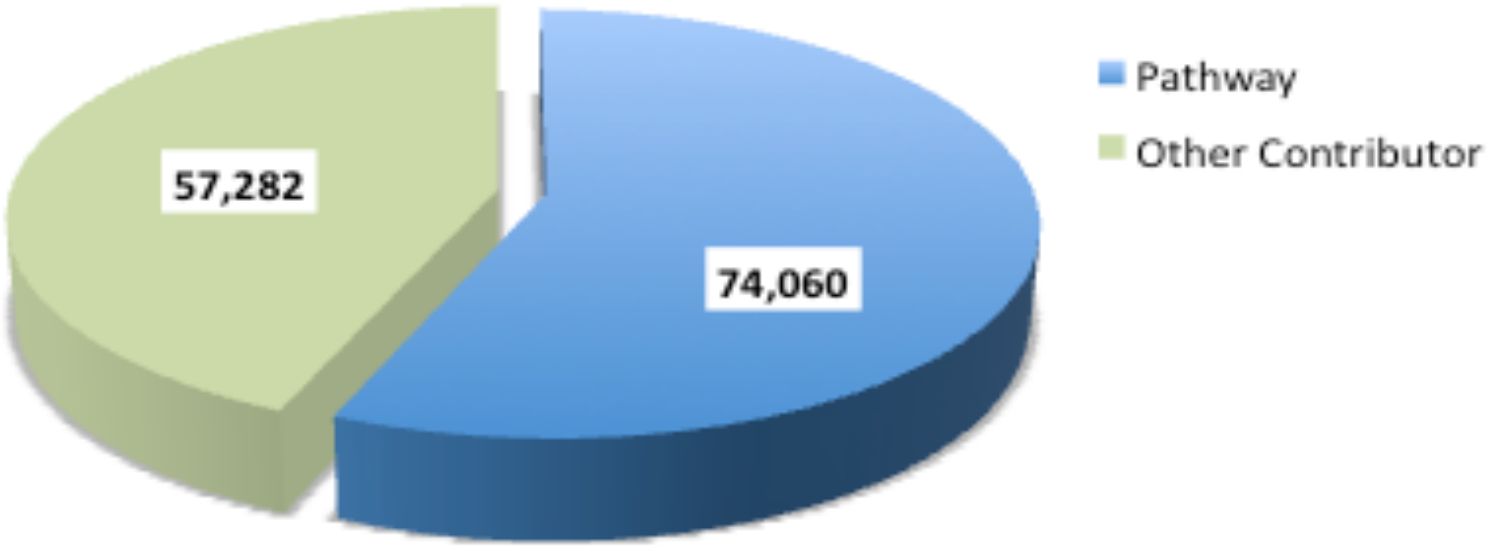
Pathways: 56% of collection

Non-pathways: 44% of collection

Early 2009: 2.75% of library

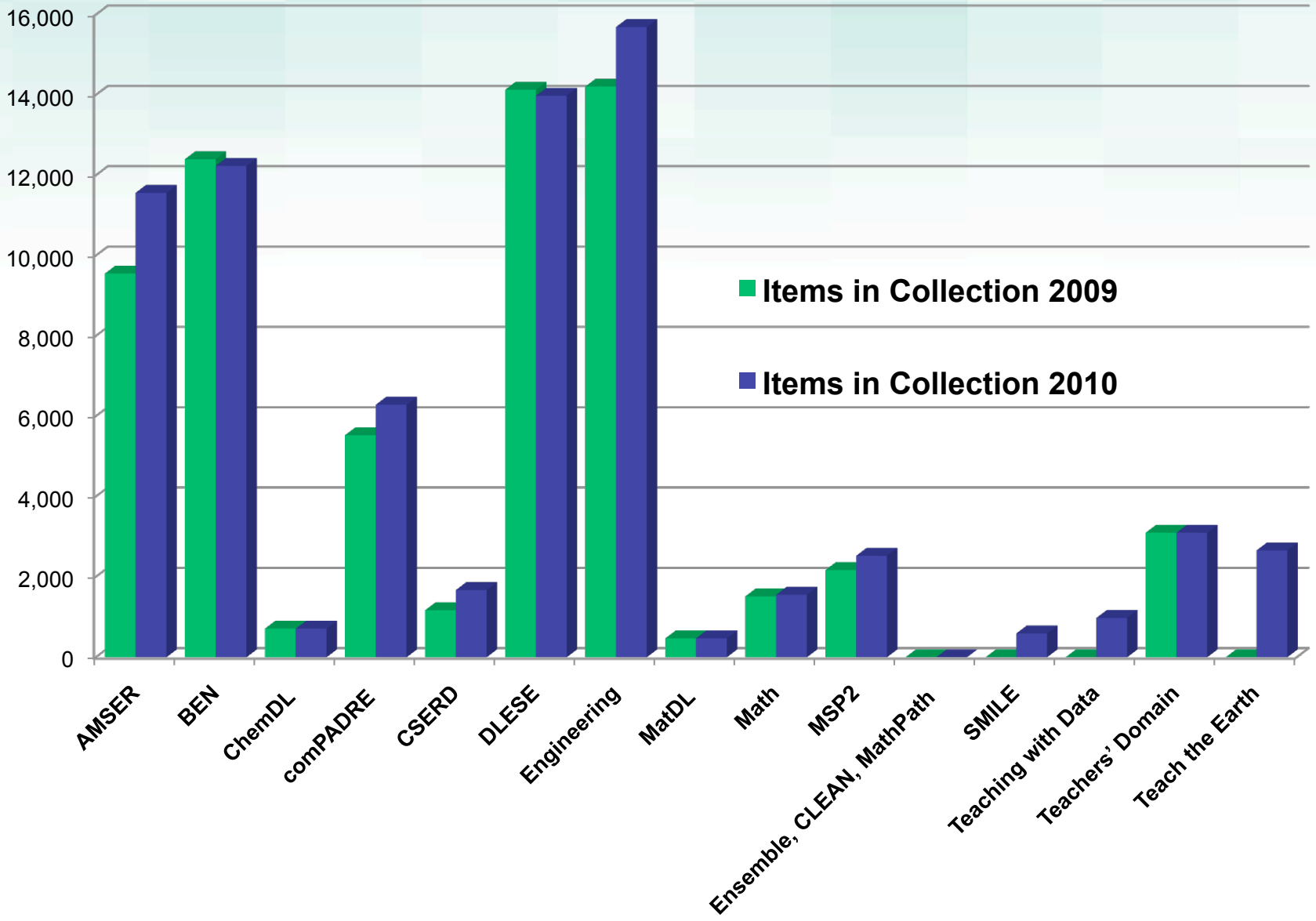
Late 2009: 56% of library

Sept 2010: 56% of library

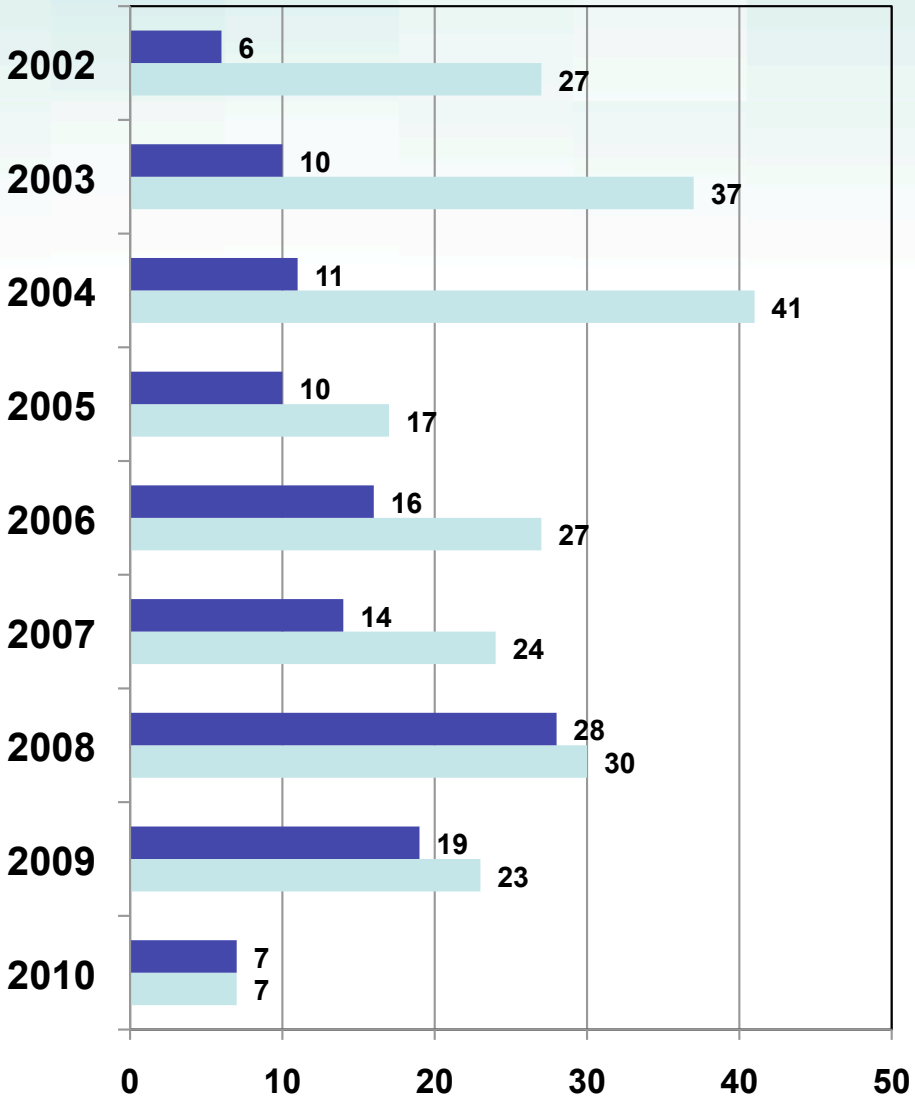


September 2010: 131,342 resources
NSDL has grown by 12,507 resources since end of 2009 de-accessioning

Pathways and Pathway Affiliates – Change from 2009



Collection Longevity



In 2010, the NAB reviewed 8 collections, and accepted 7

Guiding Questions for 2010 Assessment

- What is in the NSDL collection? Are there gaps? What is the distribution of resources?
- Which individual collections are providing which metadata information? Does this affect access and use?
- What is the nature of growth of the NSDL collection as a whole and in the individual collections?

NSDL: Supporting Teaching & Learning

- Which collections are Learning Application Ready?

Collections Assessment Process

Examined individual collection and metadata records to determine:

- Collection size, growth & metadata format
- Collection use of educational metadata fields

Created a benchmark metadata term set, by combining existing NSDL vocabularies & actual metadata values, for assessment/categorization (detail of fields on next slide)

Analyzed 8 fields across the NSDL for subject, education information, resource access, and language.

Evaluated collections for Learning Application Readiness

142,600 Records, 131,342 Resources, 121 Collections

Metadata Info	Maximum # of unique terms found in fields	% of records with any entry	% records reviewed & categorized (or not
Access Rights *	36	9.4%	100%
Audience *	157	41.3%	99.1% (562 not)
Education Level *	82,951	55.7%	99.2% (2,798 not)
Educational Stds	1,078	3.78%	94.5% (304 not)
Language	60	75.4%	99.9% (34 not)
Mime Type	1,345	48.7%	94.0% (4,410 not)
Resource Type *	565	78.3%	99.7% (397 not)
Subject	82,722	81.0%	91.9% (10,133 not)
Total	***168,915***		

Sample of Education Level Terms Analyzed

"11-14 year olds", "12 year old", "14-18 year olds", "18 years and older individuals", "4-6 year olds", "5-8", "6-
class='vocabprefix'>Elementary School :Early Elementary", "Elementary S
"Administrators", "Adult", "Advanced placement Students", "All", "College", "College (13 - 14)", "College (15 -
"Early Elementary", "Education and Training Resources -- Texts, Manuals, Other Media -- Automotive techno
"Elementary / Middle School", "Elementary Education", "Elementary School", "Elementary School :Early Elem
College", "First-Year Undergraduate / General", "Fourth Grade", "Fourth grade", "Fourth-Year College", "Gen
Undergraduate_Freshman Undergraduate_Sophomore Undergraduate_Junior Undergraduate_Senior", "Gra
Undergraduate_Sophomore Undergraduate_Junior Undergraduate_Senior Technical_Education_Lower_Div
Graduate_Professional Elementary_School_Programming Middle_School_Programming High_School_Progr
5-8", "Grades 6-12", "Grades 6-8", "Grades 6-9", "Grades 7 - 9", "Grades 7-10", "Grades 7-12", "Grades 7-9",
"Graduate_Professional", "Grandparents", "Higer Education", "High School", "High School (9-12)", "High Sch
:Graduate/Professional", "Higher Education :Undergraduate (Lower Division)", "Higher Education :Undergrad
"Librarians", "Lifelong learners", "Middle (6-8)", "Middle School", "Middle School (6-8)", "Middle School Progra
Professionals", "Other educational professionals", "P16 STEM educators", "Parent", "Parent/Guardian", "Par
Development", "Professional Education", "Professional Teaching and Learning Cycle (PTLC)", "Professional
"Secondary School Science", "Secondary School Students", "Secondary School Teachers", "Secondary scho
"Technical Education (Lower Division)", "Technical Education (Upper Division)", "Technical School First Cyc
"Undergraduate (Lower Division)", "Undergraduate (Upper Division)", "Undergraduate Students", "Undergrad
"University Second Cycle", "University instructors", "Upper Elementary", "Upper-Division Undergraduate", "Vo
women", "educator", "educators", "elementary", "elementary education", "gradschool", "graduate education",

Benchmark Term Set: *Audience*

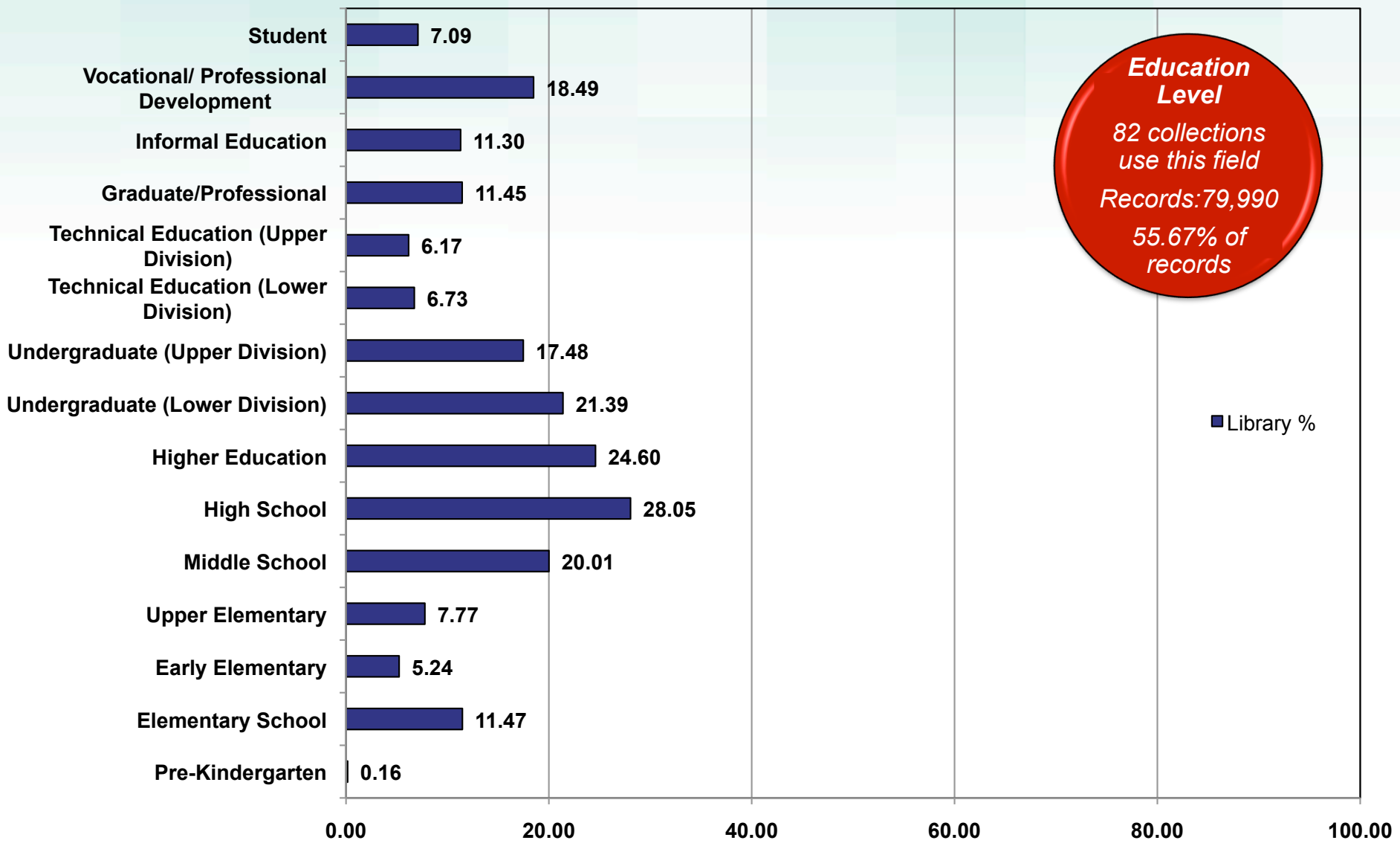
- Administrator
- Educator
- General Public
- Learner
- Parent/Guardian
- Professional/ Practitioner
- Researcher

Collections Assessment: 2010 Result Trends

General results:

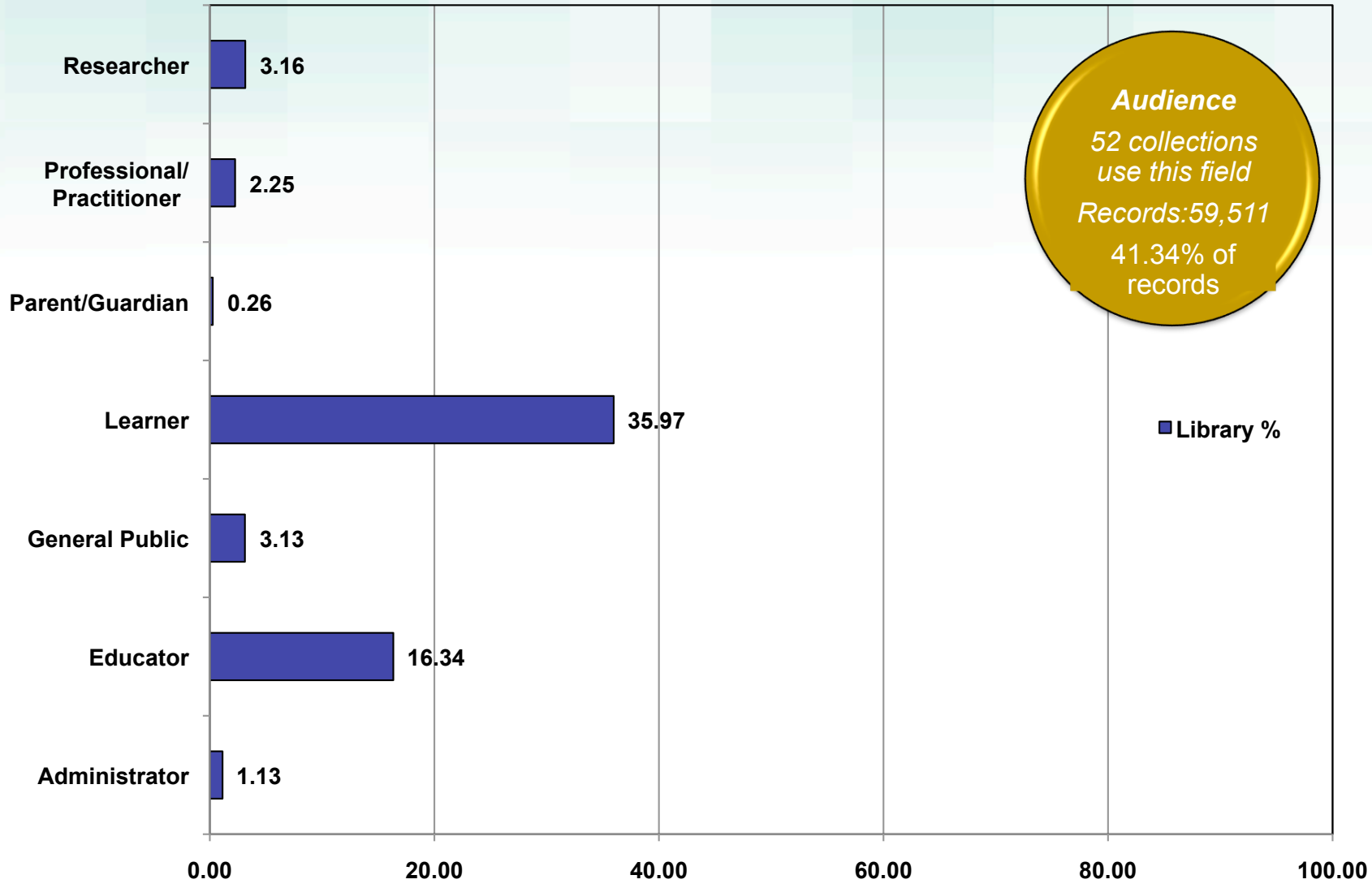
- *Educational metadata*: 25% of library collections have none, but many more collections have very little
- *Number of items*: grew by 10.52% (12,507 items)
- *Number of collections & growth*: 6 de-accessioned; 9 new, 66 static, 38 growing, 8 decreasing – 121 active
- *Learning App Ready*: several NSDL collections are ready

Education Level (55.67% of records have this data)



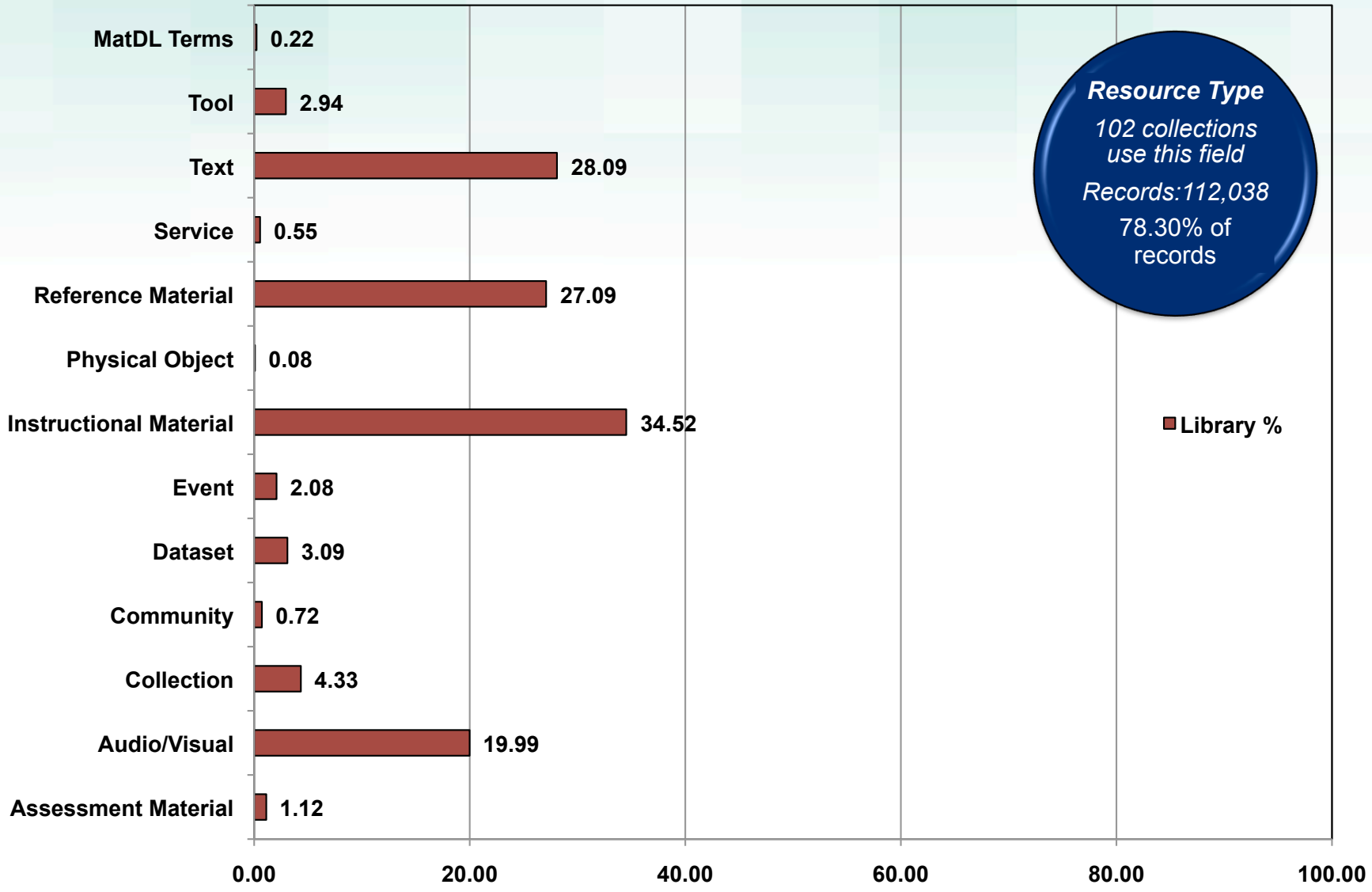
September 2010

Audience: (41.34% of records have this data)



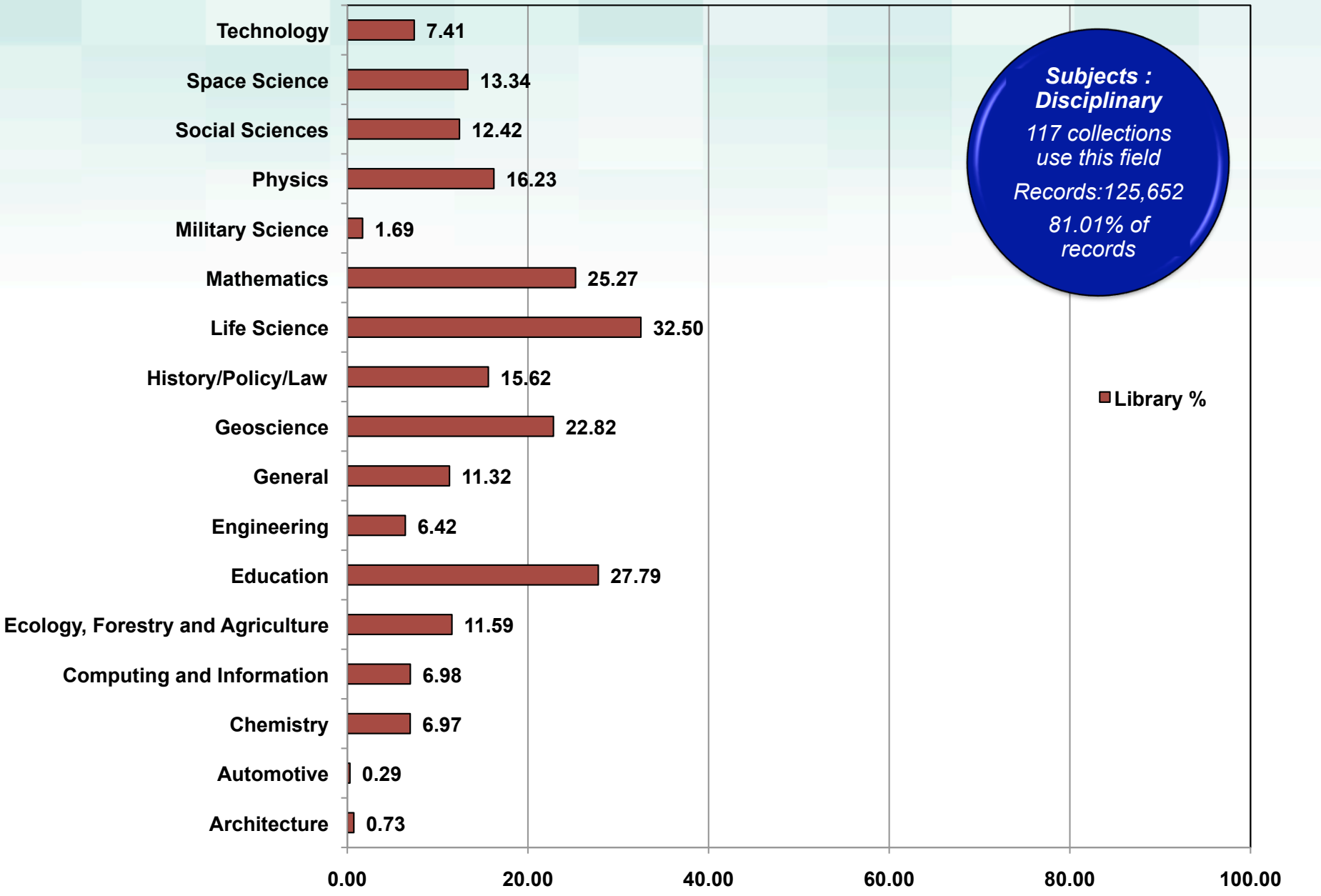
September 2010

Resource Type (78.30% of records have this data)



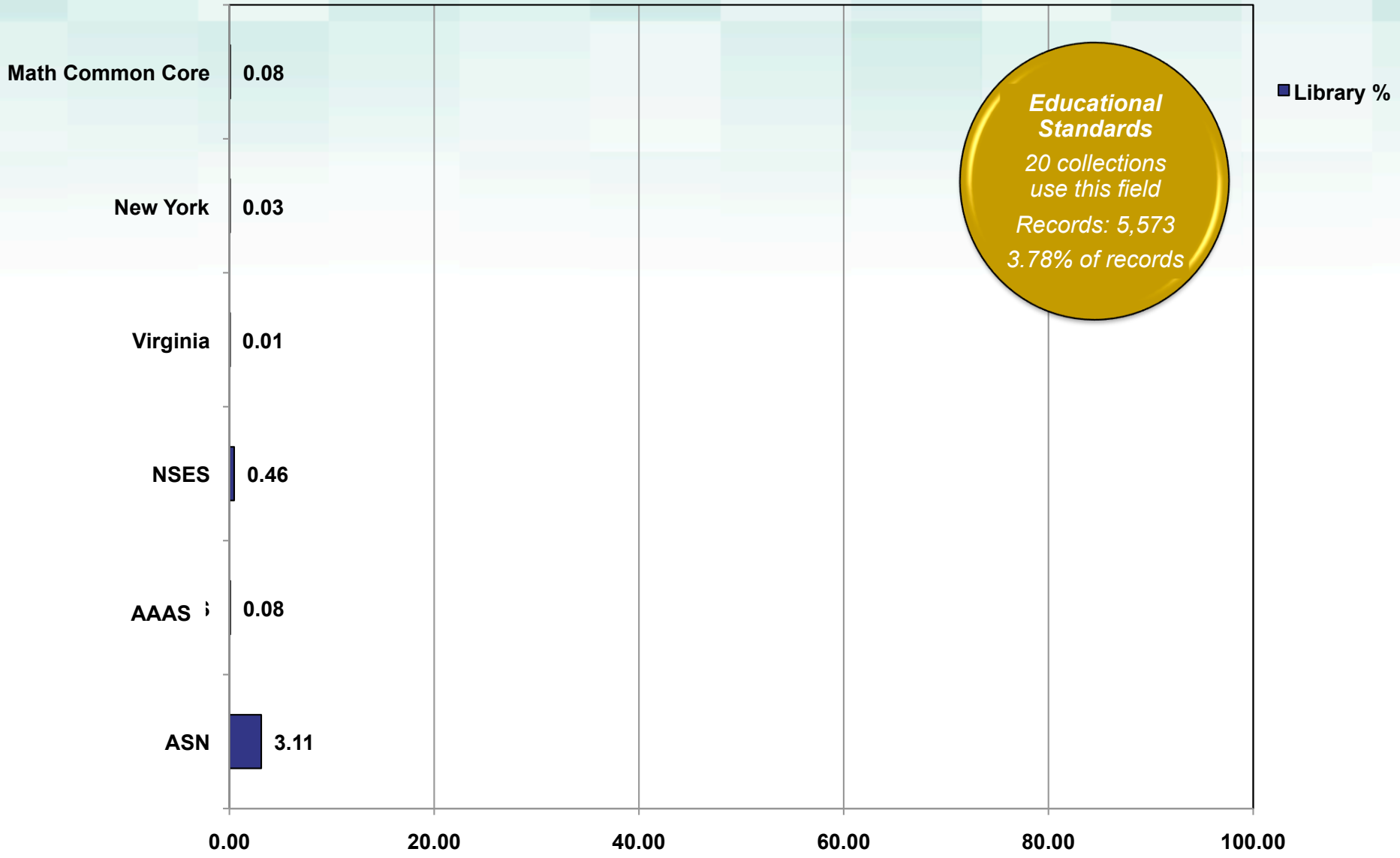
September 2010

Subject (81.01% of records have this data)



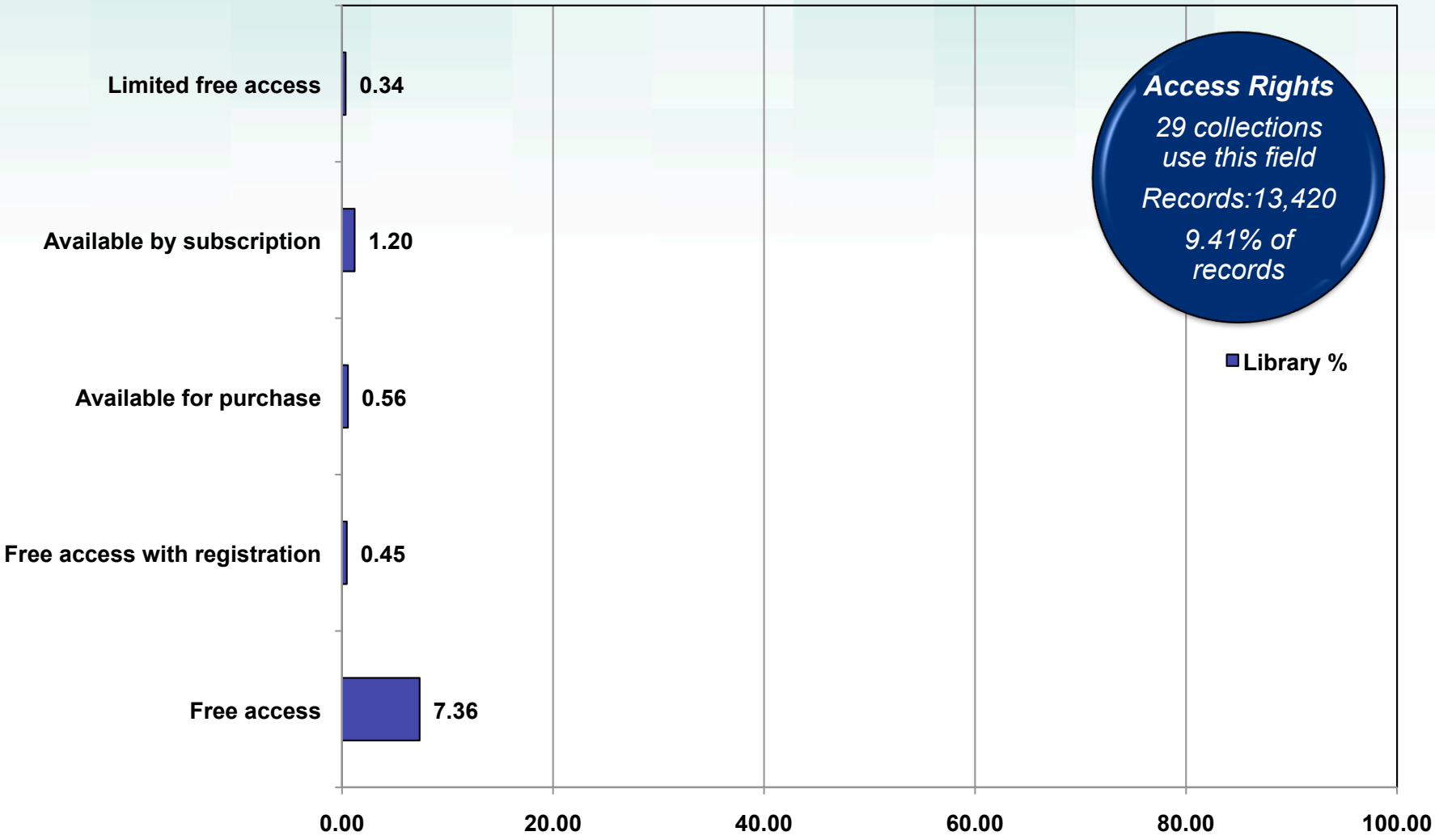
September 2010

Educational Standards (3.78% of records have this data)

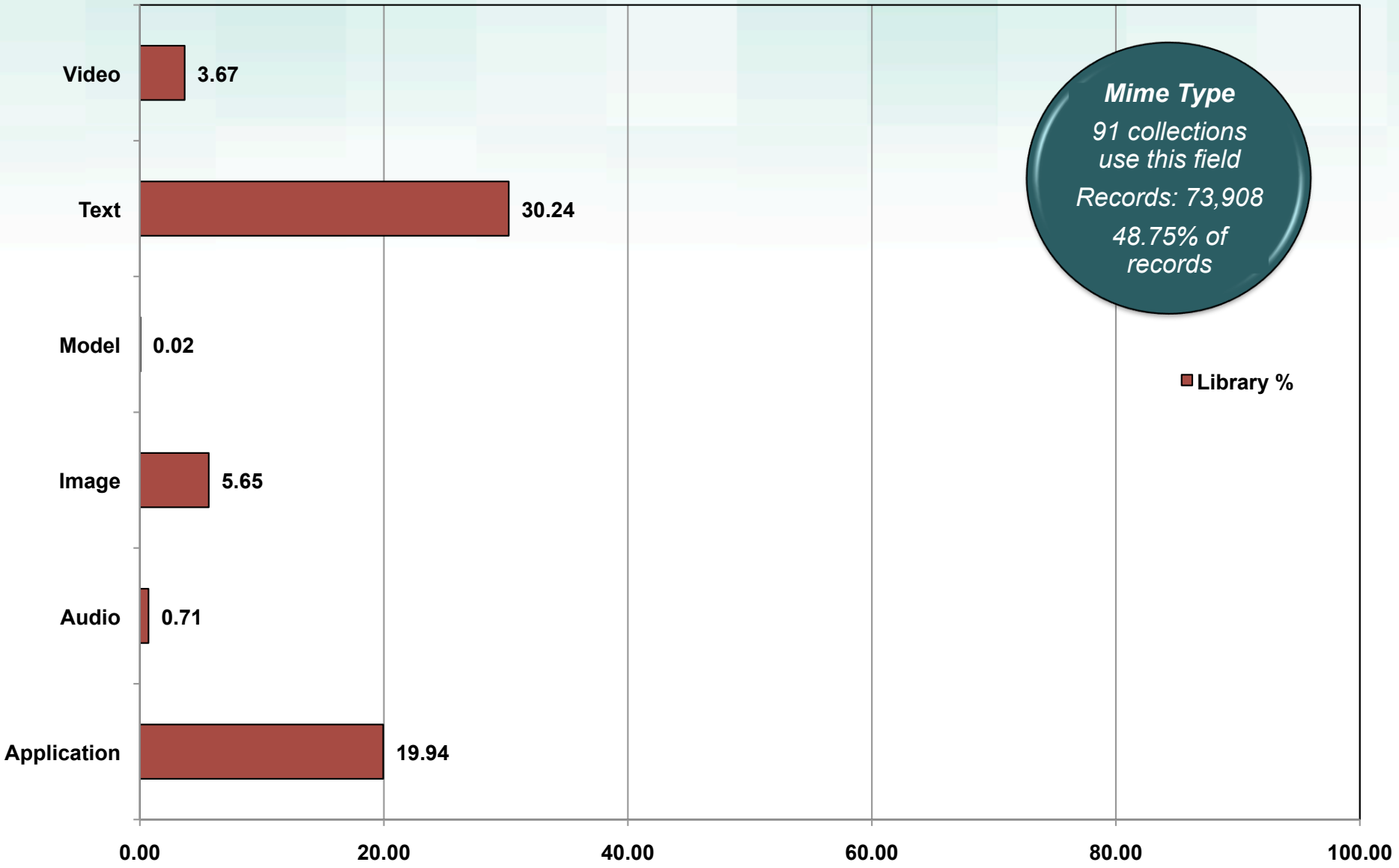


September 2010

Access Rights (9.41% of records have this data)

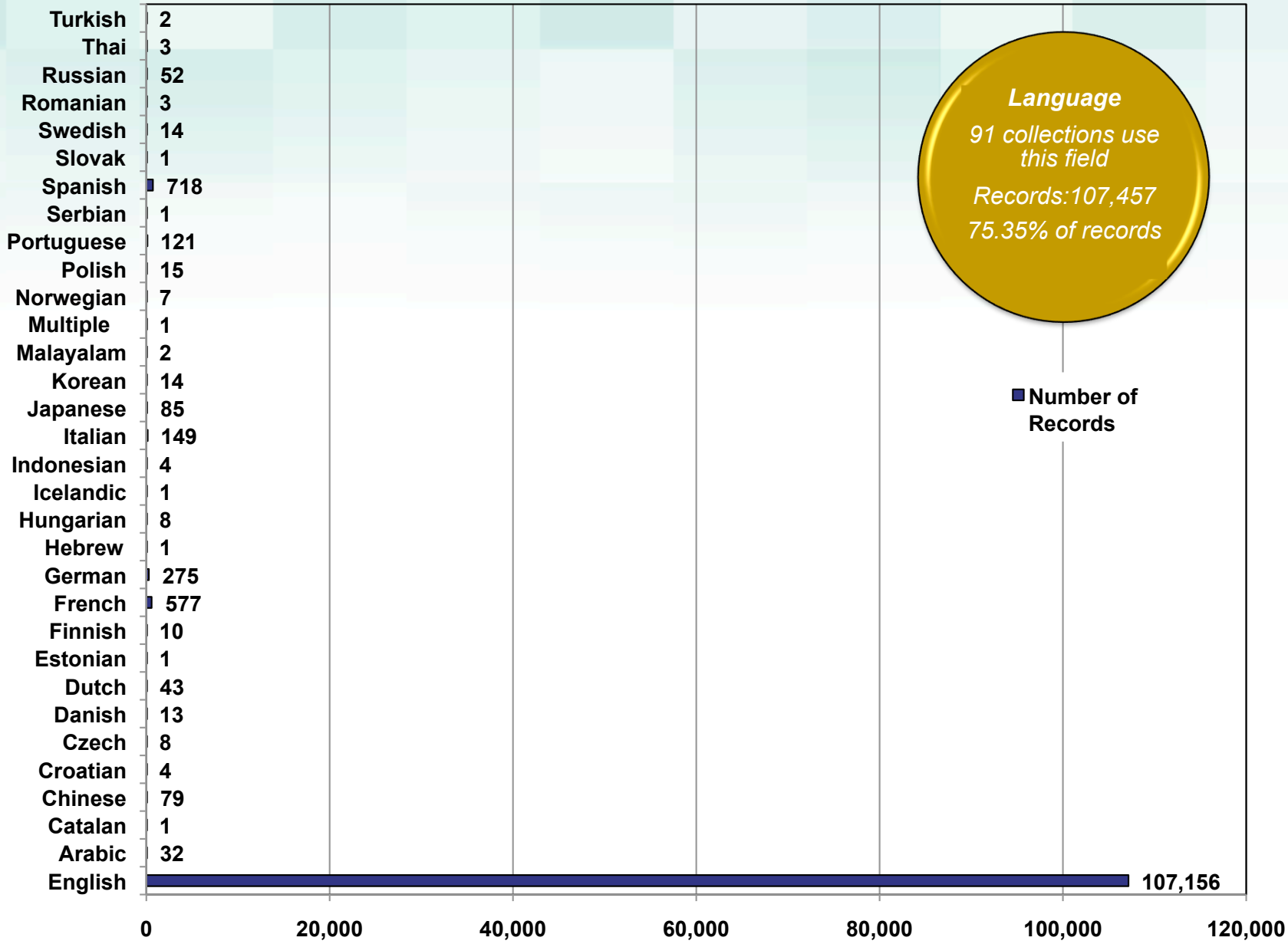


Mime Type (48.74% of record have this data)



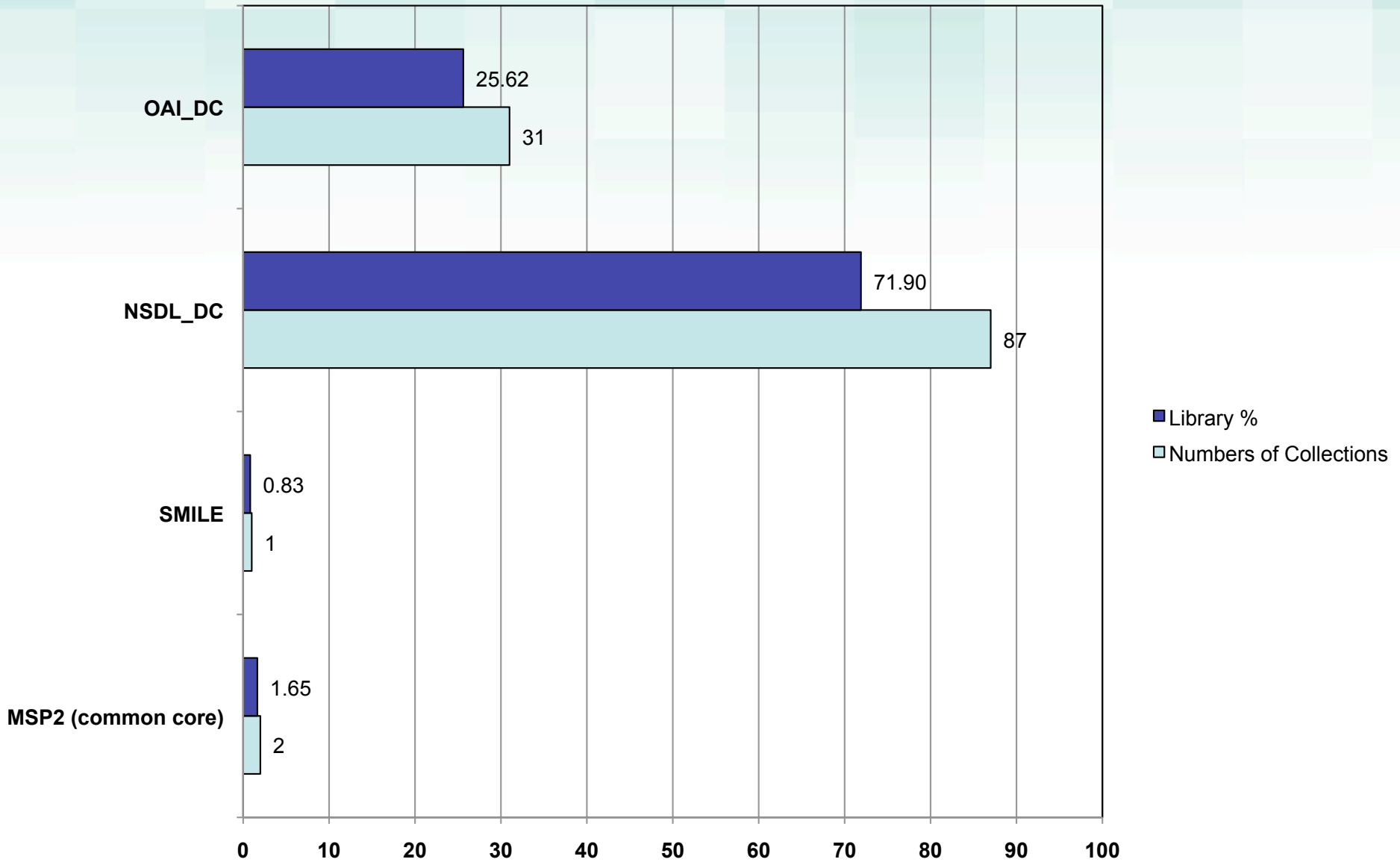
September 2010

Language (107,423 records have this data)



September 2010

NSDL Native Metadata Format



Collection Reports:

See the 8 variables for your own collection.

URL at end of talk

Name	Last modified	Size	Descri
Parent Directory		-	
ACM_Women_in_Computing.html	15-Sep-2010 14:07	9.5K	
AMSER_Applied_Math_and_Science_Education_Reposi..>	15-Sep-2010 14:07	9.9K	
Access_Excellence_The_National_Health_Museum_Th..>	15-Sep-2010 14:07	10K	
Advances_in_Engineering_Education_A_Journal_of_..>	15-Sep-2010 14:07	10K	
All_Collections.html	15-Sep-2010 14:07	11K	
Alsos_Digital_Library_for_Nuclear_Issues.html	15-Sep-2010 14:07	9.7K	
American_Museum_of_Natural_History.html	15-Sep-2010 14:07	9.6K	
Analytical_Sciences_Digital_Library_ASDL.html	15-Sep-2010 14:07	9.6K	
Animal_Diversity_Web.html	15-Sep-2010 14:07	9.5K	
Ask_A_Biologist.html	15-Sep-2010 14:07	9.4K	
Atmospheric_Visualization_Collection_AVC.html	15-Sep-2010 14:07	9.6K	
Atomic_Archive.html	15-Sep-2010 14:07	9.4K	
Beyond_Penguins_and_Polar_Bears_An_Online_Magaz..>	15-Sep-2010 14:07	9.9K	
Biological_Sciences_Gateways_and_Resources.html	15-Sep-2010 14:07	9.7K	
BiosciEdNet_BEN_Digital_Library_Portal_for_Teac..>	15-Sep-2010 14:07	10K	
Bridge_NOAA_Collection.html	15-Sep-2010 14:07	9.5K	
Bridge_Sea_Grant_Ocean_Sciences_Resources_Cente..>	15-Sep-2010 14:07	9.8K	
Broadening_Participation_in_Computing_BPC.html	15-Sep-2010 14:07	9.7K	
COMET_Program_Collection.html	15-Sep-2010 14:07	9.5K	
CSERD_Computational_Science_Education_Reference..>	15-Sep-2010 14:07	9.7K	
Center_for_Sustainable_Engineering_CSE.html	15-Sep-2010 14:07	9.6K	
Centers_for_Ocean_Sciences_Education_Excellence..>	15-Sep-2010 14:07	9.8K	
ChemCases_General_Chemistry_Case_Studies.html	15-Sep-2010 14:07	9.6K	
Chemical_Education_Digital_Library_ChemEd_DL.html	15-Sep-2010 14:07	9.7K	
Chemistry_Gateways_and_Resources.html	15-Sep-2010 14:07	9.6K	
Choosing_and_Using_DLESE.html	15-Sep-2010 14:07	9.5K	
Collection_Group_DLESE.html	15-Sep-2010 14:07	9.5K	
Collection_Group_Engingeering.html	15-Sep-2010 14:07	9.5K	
Collection_Group_Math.html	15-Sep-2010 14:07	9.4K	

Learning Application Readiness

The goal is to support contextualized learning experiences, allowing users to find and use, or deliver, just the right digital content at the right time.

The concept of Learning Application Readiness refers to how closely educational resources, collections, and their related metadata are aligned to educational goals, curriculum, or professional development needs of users, and how readily said resources and collections can be embedded in tools and services that educators and students use. So, for this framework, a learning application generally uses frameworks that characterize resources by subject, education level, resource type, audience, and educational standards, among other elements.

Learning App Criteria – the *Resources*

- **21st Century contexts**: resources advance critical thinking, problem solving, collaboration; support the interdisciplinary nature of knowledge
- **Collection relevance and quality**: content supports STEM; current, reliable and authored; sufficiently to meet needs of educators and researchers
- **Contextuality**: resources are fully described, in standard formats, and structured in such a way that users can easily draw upon and embed them
- **Accessibility**: Rights, licenses, permissions stated; and needed technical requirements are available

Learning App Criteria – the *METADATA*

Used to make resource criteria decisions programmatically

Field	Actual NSDL Record	Learning App Ready Record
Title	Rainwater Harvesting Service Learning Project	Rainwater Harvesting Service Learning Project
Descrpt	In this service learning project, students, teachers and community members will work together to design and construct a rainwater harvesting system for their school campus. Research RWH design basics and local conditions Explore how RWH could be used on your campus and develop a basic design. Present findings and action plan to community partners, school administration and student body. Enact the action plan to construct a RWH system on your campus and raise community awareness for water conservation	***Use the same description or here is another***: Students will gain an understanding of the history, benefits, and components of a rainwater harvesting system and partner with community members to design and build a rainwater harvesting system for their school. Students will learn about rainfall patterns, the relationship between catchment area and rainwater volume and water use.
Res Type	Project, Service Learning	Instructional Material: Project
Audience	None listed	Educators, Students
Ed Level	None listed but the actual resource has it on the 1st page.	Middle School, High School, Higher Ed, Informal
Access Rights	None listed	Free access
Language	None listed	en-US

Collections Most Ready for Learning Apps

- TeachEngineering
- Math Common Core Collection
- NSDL Science Refreshers
- Harvard Smithsonian Digital Library

Also noteworthy:

- TeachingWithData
- Teachers' Domain
- Compadre
- SMILE
- MSP2

TEACH Engineering

NSDL Steps Toward LAR

- Accepting native metadata
- Normalizing/standardizing variability of metadata across evaluated fields
- Developed annotation and usage data frameworks
- Accepting annotation and usage metadata
- Providing URL link checking info (March)
- Support and training

Recommended Pathway Actions

Vocabulary usage:

- use NSDL vocabularies
- use well-developed local vocabularies consistently (eg, MSP2 science and math subject list)

Framework choice:

- use an educationally oriented framework (nsdl_dc over oai_dc, eg. MathPath, MSP2, DLESE)

Cataloging:

- careful and complete cataloging, especially in fields that promote educational resource discovery

Collection curation:

- ongoing collection maintenance of URLs, dated resources, and expired metadata

Further Information

NSDL Metadata Guidelines

NSDL Metadata Vocabularies

- Resource Type
- Education Level
- Audience
- Access

NSDL Collection Policy

NSDL Resource Guidelines

Examples of LAR Records (will be emailed or posted)

Contacts:

Katy Ginger: NSDL Collections Manager,
Technical Network Services (ginger@ucar.edu)

Letha Goger: NSDL Collections Engineer,
Technical Network Services (lgoger@ucar.edu)

Individual Collection Reports

http://www.dls.ucar.edu/people/kginger/assessment/reports/