

# Displaying Resources in Context: Using Digital Libraries to Support Changes in Undergraduate Education

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## Abstract

*Education digital libraries strive to foster major improvements in education by supporting adoption of more effective teaching methods. We present initial efforts to assist faculty in changing teaching practice by displaying digital library resources in portals that address a specific educational issue and provide the full spectrum of resources needed to both motivate and implement a change in practice.*

We have developed two example sites to date:

*Using Data in the Classroom* ([serc.carleton.edu/research\\_education/usingdata/](http://serc.carleton.edu/research_education/usingdata/); highlighted as an NSDL specialized portal [nsdl.org](http://nsdl.org)) Designed for use by faculty in all science disciplines, this site presents a discussion of why faculty might be interested in engaging students with data in their courses, examples of current practice, a variety of data access and manipulation tools, links to pedagogic resources, and a discussion forum

*Teaching Quantitative Skills in the Geosciences* ([serc.carleton.edu/quantskills/](http://serc.carleton.edu/quantskills/)) Teaching quantitative skills is often challenging. This site, designed for geoscience, provides information on strategies and methods for teaching quantitative skills, teaching materials, and resources for students drawn from geosciences, mathematics, and other science disciplines

Both sites have a steadily increasing user populations with current use at approximately 50 sessions per day. A more extensive evaluation study is under development.

Our initial work exposes three primary challenges in development and management of websites embedding digital library resources in the context of a specific issue:

Location of resources and generation of issue-specific content is time consuming and requires participation by geographically distributed experts.

The number of links to outside resources quickly grows to a scale where managing them becomes a significant issue.

A wide variety of means must be used to draw linkages between content-specific teaching resources and effective pedagogy and methods.

Building on the DLESE Catalog System and the DLESE OAI tool ([www.dlese.org/Metadata/tool](http://www.dlese.org/Metadata/tool)) we have

developed a content management system (CMS) that supports distributed authoring of site content; metadata harvesting to build and share the resource collection; management of resource collections and site content; and dynamic generation of web pages that adhere to web standards and meet web accessibility guidelines.

The CMS enables resource management in three ways. Resources currently cataloged in any of our collections or DLESE can be browsed and inserted into pages; resources can be aggregated into lists and inserted into pages with standard or customized short descriptions; or new resources can be cataloged and inserted simultaneously into the page and the relevant local collection. The metadata are easily harvested by DLESE and NSDL using the OAI protocol. In this way, the resources are managed in a format that allows sharing with other digital library efforts.

The digital library tools and their integration with our CMS automate the tracking and cross-referencing of resource links, drastically simplifying management. We expose these cross-references internally, providing links from content-specific resource descriptions to their referent pedagogic pages. These cross-references can also be made explicit in our web sites to assist users in moving from resources to pedagogic material. Inclusion of this information in the metadata we share with other digital libraries will allow them to provide links from resource records in their library to our pages incorporating the reference. In this way, educators could move directly from a content-specific resource in DLESE or NSDL to the information on our site about how to use that resource in a specific educational context.

Our sites demonstrate how portals can be used to provide context for digital library resources tailored to a particular audience or issue. The use of existing digital library collections, readily available digital library tools, and standards for metadata and interoperability makes development of such sites feasible. While initial use-metrics indicates strong interest on the part of educators, an important next step is a thorough evaluation of site use and its impact on teaching practice.

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