Using Data in the Classroom

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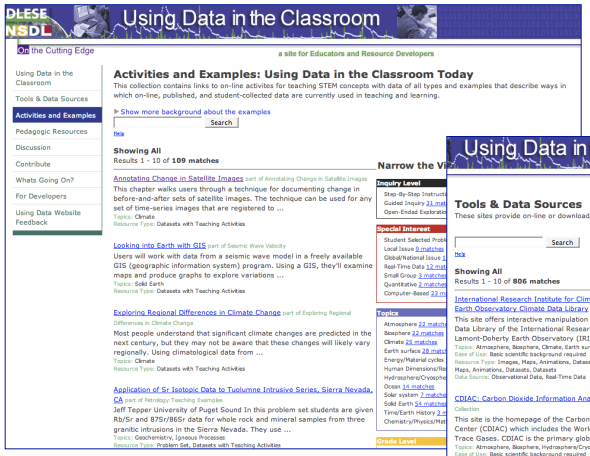
Faculty and teachers understand the power of engaging students directly with data and are tremendously enthusiastic about the possibilities of incorporating data-rich activities in their teaching. Three of the most challenging aspects of teaching with data are 1) presenting data with analysis tools that can be quickly mastered, 2) designing learning activities to match the level of student expertise with data analysis and critical thinking, and 3) creating assessments that capture learning beyond factual recall. The Using Data in the Classroom portal (serc.Carleton.edu/usingdata) helps faculty excel at teaching with data by providing easy access to a wide range of data, discussion of the ways in which data can be effectively used in the classroom, examples of data- rich activities at a variety of educational levels across a range of geoscience topics, and references to pedagogic information. The portal makes use of faceted search and browse to facilitate discovery of these resources by topic, ease of use, type of learning activity, and other terms of interest.

Searchable Collections of:

Data-rich Teaching Activities



Datasets and Data Tools

Educators explore these collections using a faceted search tool described in more detail on the poster:
Exploring Multi-Faceted Search in Specialized Collections

For Educators

Those who develop datasets and data access tools face a range of challenges in making their resources effective in educational settings. The developers area of the Using Data in the Classroom portal provides a jump-off point for those addressing these challenges. A new resource of particular interest are the criteria to the right. Building on work from the data, visualization, models strand at the DLESE annual meeting the DLESE Data Access Working Group has pulled together this list that developers may use to assess their resources and help guide future development.

For Developers

Criteria for Data Sites that Support Effective Educational Use

(compiled by the DLESE Data Access Working Group)

1.2.1 Data site allows educators and students to find and access appropriate data of interest easily.
- Level of prerequisite knowledge for use is clear
- Interface is well-designed to support querying to answer applicable scientific questions
- Semantically transparent metadata enable data discovery

1.2.2 Data site allows educators and students to ascertain the quality of data and determine the impact of data quality on the certainty of their conclusions.
- The data site is presented in such a way that an educator will likely draw correct conclusions about its accuracy/limitations.
- Information is provided about overall data collection, quality, reduction, and limitations. Data site includes sources of error and limitations of collection process as well as inaccuracies/ uncertainties from models/ particular choice of representations.
- Information about accuracy of individual data sets/points/ analyses is provided

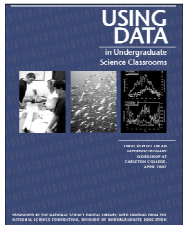
1.2.3 Data site supports students ability to manipulate data to answer questions
- By using data contained within the site
- By combining data within the site with data from other sites
- By generating appropriate visualizations
- By comparing student's own data to that in the site

1.2.4 Use of the dataset by non-experts is supported
- Information is provided on relevance of data to problems of significance
- Support for effective pedagogic use

1.2.5 Robustness of access
- Data and software needed for use are reliably available
- Tools needed for access and use are easily acquired and inexpensive
- Tools are reliable and easy to use
- Data are archived appropriately for persistent access

Using Data in Undergraduate Science Classrooms Report

Drawn from an NSDL workshop held in 2002 this report addresses:
- What do we mean by data?
- Why is using data important?
- How do we do it?
- What do we know about how well this works?
- What are the implications for digital libraries and data providers ?



This work is supported by NSF-DUE-0127298 NSF-GEO-0304762