

Motivating and Supporting Faculty Use of Educational Digital Libraries: An Example from the Geosciences

Cathryn A. Manduca, Ellen Roscoe Iverson, Sean Fox Science Education Resource Center, Carleton College

Flora McMartin, MERLOT



The Science Education Resource Center (SERC) is developing customized thematic collections and portals for DLESE that seek to help faculty in improving geoscience education. To be successful, this work must be grounded in an understanding of how faculty think about their teaching and use the web in their work. This poster highlights results of a set of faculty interviews and site walkthroughs; shows how these results influenced design; and presents webmetrics indicating that the design was successful.

What are faculty thinking and doing?

A focused study on a small sample

- 8 structured interviews of faculty with a range of teaching experience from 2 and 4 year colleges and research universities in Minnesota, 1 graduate student interview
- 21 additional walkthroughs using scenario-based think-aloud protocol
- Iteratively developed coding scheme
- Supporting data from a national survey of geoscience faculty (Macdonald and others, 2005)

Pedagogy and Content: While many faculty have a general knowledge of teaching methods, they are most interested in the application of these methods to the specific topics they teach, and they prefer to learn about teaching methods within such a context. Examples of the use of methods to teach geoscience are particularly important as a bridge between their own work and a more abstract discussion of teaching methods.

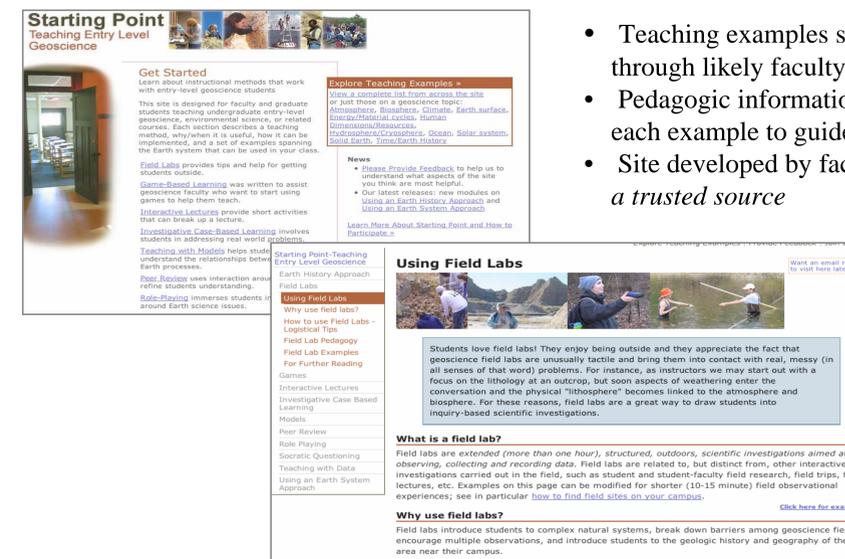
The Role of the Colleague: Faculty colleagues play a critical role as sources for information about teaching and in validating the decisions faculty make about methodology and content. These results are consistent with the results from a larger, nationwide survey of geoscience faculty [Macdonald and others, 2005] indicating that conversations with other geoscience faculty are mentioned more frequently as a source for information on teaching methods than are workshops, professional society meetings, publications, or on-line resources. Faculty referral may be critical for building use of digital libraries like Starting Point, and making visible use of faculty as authors of library content may increase both interest and confidence in the site.

Preparation for Teaching: Faculty work within two time scales as they prepare their courses: 1) designing the entire course and 2) preparing for a single class. Faculty we interviewed talked about designing a course in the year, month, or weeks before the course takes place. This activity typically culminated in completion of the course syllabus. It was during this phase that faculty felt they might be able to make a large change in their preparation methods that would result in a change in the structure of the course or its assignments. Relatively few faculty use the web to assist them in designing a course. In contrast, faculty described preparing in the preceding minutes, hours, or days for an upcoming class. During this time they frequently seek materials to enhance an existing lecture or, less frequently, seek materials with which to design a new activity. A successful design would capitalize on faculty use of the web to find materials for class as a mechanism for bringing them into contact with materials that could be used later to support their redesign of a course.

References:

- Manduca, C., Iverson, E., Fox, S., McMartin, F., Influencing User Behavior Through Digital Library Design: An Example From the Geosciences, D-Lib May 2005. Available at <http://dlib.org/dlib/may05/fox/05fox.html>.
- Macdonald, R.H., Manduca, C.M., Mogk, D.W. and Tewksbury, B.J., Teaching Methods in Undergraduate Geoscience Courses: Results of the 2004 On the Cutting Edge Survey of U.S. Faculty. *Journal of Geoscience Education*, May, 2005
- Fox, S., Manduca, C.M., Iverson, E. Building Education Portals atop Digital Libraries. *D-Lib Magazine*, January, 2005. Available at <http://www.dlib.org/dlib/january05/fox/01fox.html>.

Starting Point: Designed with this research in mind



- Teaching examples searchable by geoscience topic; easily discoverable in Google through likely faculty searches
- Pedagogic information, including tips for use and adaptation, is intimately linked with each example to guide faculty from what they seek to what they need to know
- Site developed by faculty colleagues and peer reviewed to increase its ability to become a trusted source



Does the Site Design Work as Expected: Initial Evaluation Results

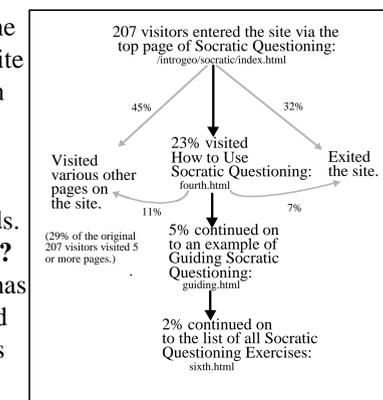
Are Users Behaving As Expected: 80% of Starting Point visitors arrive at the site via a search engine. 30% of the top 200 search terms used to find the site were clearly geoscience-related. Only 25% of visitors started their visits on the site home page or the topic page of a pedagogic module.

Are Users Finding Information on Pedagogic Methods? Examples of the two common types of path through the site are shown at the right. In both cases users move between examples and information on pedagogic methods.

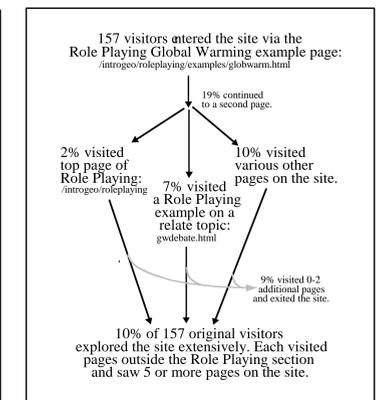
Is Interaction with the Site and its Resources Impacting Users' Teaching?

Usage statistics suggest that users are finding the site of value: site traffic has grown to roughly 12,000 visitors per month in 2005. 15% of visitors spend 10 minutes or more on the site and approximately 10% return several times per month. Participants in a web-based survey, phone interviews, and walkthroughs indicate specific examples or ideas that they have used or plan to use in class.

serc.carleton.edu/introgeo



Typical path showing visitors starting from a top-level pedagogic page. (Data from November 2004.)



The typical paths of visitors moving from topical example into pedagogic content. (Data from October and November 2004.)