Using Interdisciplinary Projects + Technology to Foster Research + Collaboration in Graphic Design:

Teaching using the WWW to reinforce core design values

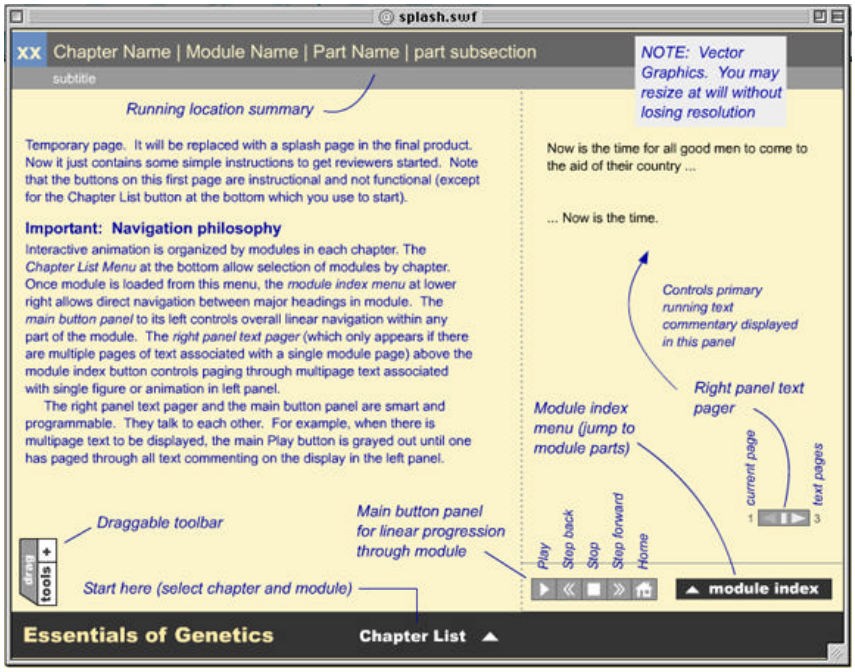
Over the last 5 years the author has worked with faculty in the Physics and English departments and a group of student designers on interdisciplinary, web oriented projects. Regardless of the specific visualization objectives, ease of navigation and information accessibility were the primary objectives in all of the projects. In addition, all of the projects were similar in that they all contained: 1. large data set, and 2. varied presentation requirements (text, imagery, video, animation, etc.). In the end, similar design attributes were manifested in all cases. Even though the design teams were working with different publishers and different primary content authors, the analysis of the information and the creation of an intuitive navigation system that showcased required content, yielded similar visualizations and hierarchic organizations.

This illustration shows the theory behind the design choices used to create the template for "Essentials of Genetics" as well as "Biology, A Guide to the Natural World".
While color was used to differentiate the titles, the same programming template and grid structure were employed to facilitate production.

Fig.1 | http://csep10.phys.utk.edu/klug/

Pedagogy

The primary goal in pursuing all of these projects was to provide the students with the opportunity to: 1. Work collaboratively, both with other designers and with primary content authors, 2. Pursue research beyond the web, and 3. Analyze existing visual conventions and propose new alternatives. There are several difficulties to be overcome in preparing to teach a class about the Web, utilizing the Web. First is the changability of the Web itself. Class preparation requires prior planning, however, by the time the instructor gets to a specific unit on the web, that information may have changed. Several times during the course of these projects upgrades would become available that would alter



the technical limitations of the project. Second is the student's expectation of a "class" and their role as a "student". The Web is very effective at helping to dispel the traditional teacher/student paradigm. Students new to the web will usually have a very different methodology in pursuing research compared to someone who began their research career prior to the introduction of the WWW. In this case we created a class where the students became their own teachers with respect to the technology and the instructor helped the students to work together and directed the research. A student might find him/herself as tutor and pupil all in the same class period. In addition, the relationship of the student to the Web itself is not consistent. Students have different learning styles or preferences. The Web allows each student to develop a different "answer" to a common question. These answers can reflect insights on numerous levels including visual, conceptual and technical. This environment creates a unique situation for discussions that foster insights about viewer/reader expectations.

The Case Studies

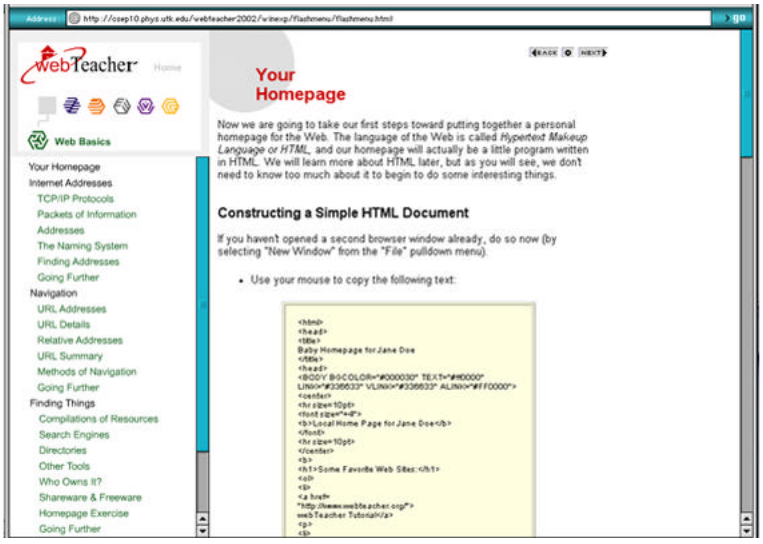
By reviewing the attached figures, the reader can explore the design collaborations with Biology, Genetics, English and Astronomy. In all cases the intent was similar: to design an interface that would facilitate the acquisition of information by beginning level college students. The interface had to accommodate text, imagery, video, animation and interactive laboratory tutorials. In short, the interface design problem was how to create navigation that left enough room for content. While this paper format is a static presentation. The author has provided the URL's of the sites discussed in the hope that the reader will find these sights interesting enough to review in real time.

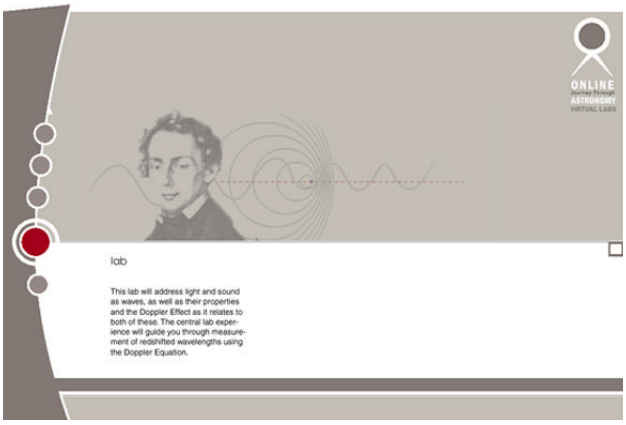
Project Analysis

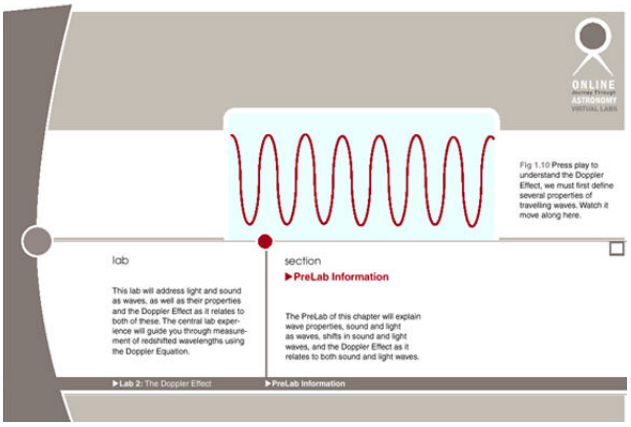
Different groups of design students were included in this investigation. All three sets of students were asked to analyze the problem without the benefit of viewing the other teams work. All three teams came to similar conclusions regarding placement and organization of content, chapter, unit and

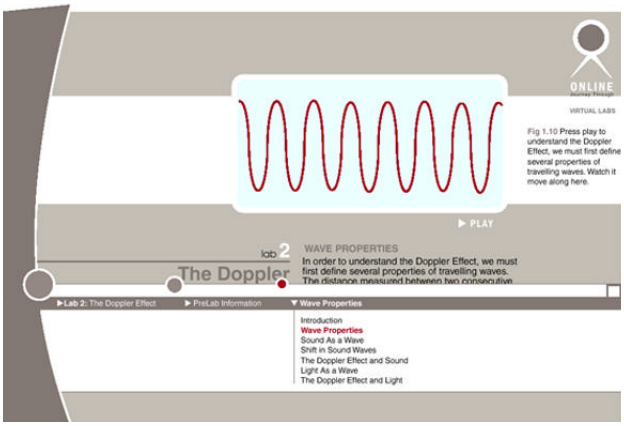
These interfaces illustrate different approaches to programming. The Genetics and Biology sites were programmed in Flash, the Verbal/NonVerbal site uses Java and the WebTeacher site uses html. The Astronomy site represents "electronic roughs" that were presented to the client.

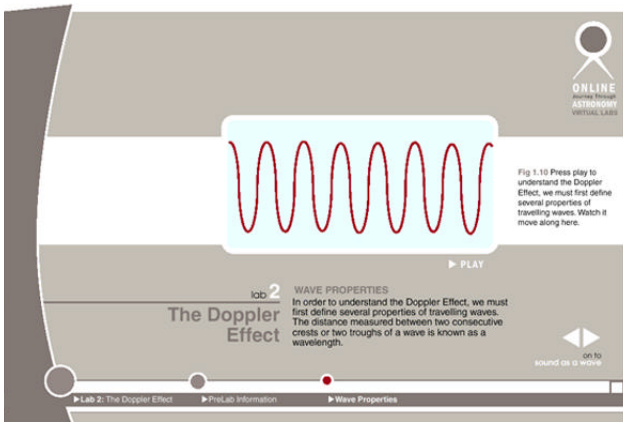
Fig.2 | http://csep10.phys.utk.edu/webteacher2002/winexp/flashmenu/intro4.html











site navigation. All teams choose to differentiate between tools and navigation and use "bread-crumbing" as a navigational tool as well as a design element. In addition, the use of a site map, use of type and typographic hierarchy was consistent.

Navigation vs. Tools

For the purpose of this experiment, Navigation + Tools were differentiated and defined as follows.

"Navigation" refers to the resources available to the user to move through the information: either from level to level or through individual pages in a specific level.

"Tools" refer to the electronic resources available to the viewer through out the experience: this includes calculators, web links, glossaries, etc.

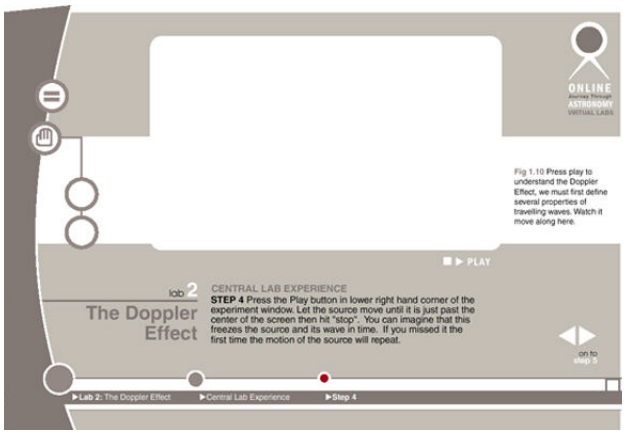


Fig.3 | Illustrator "Roughs" for client presentation

Steven Olexa provides a good example of the complexity and layering of information that is desirable to students in this proposed interface for an Astronomy Tutorial.

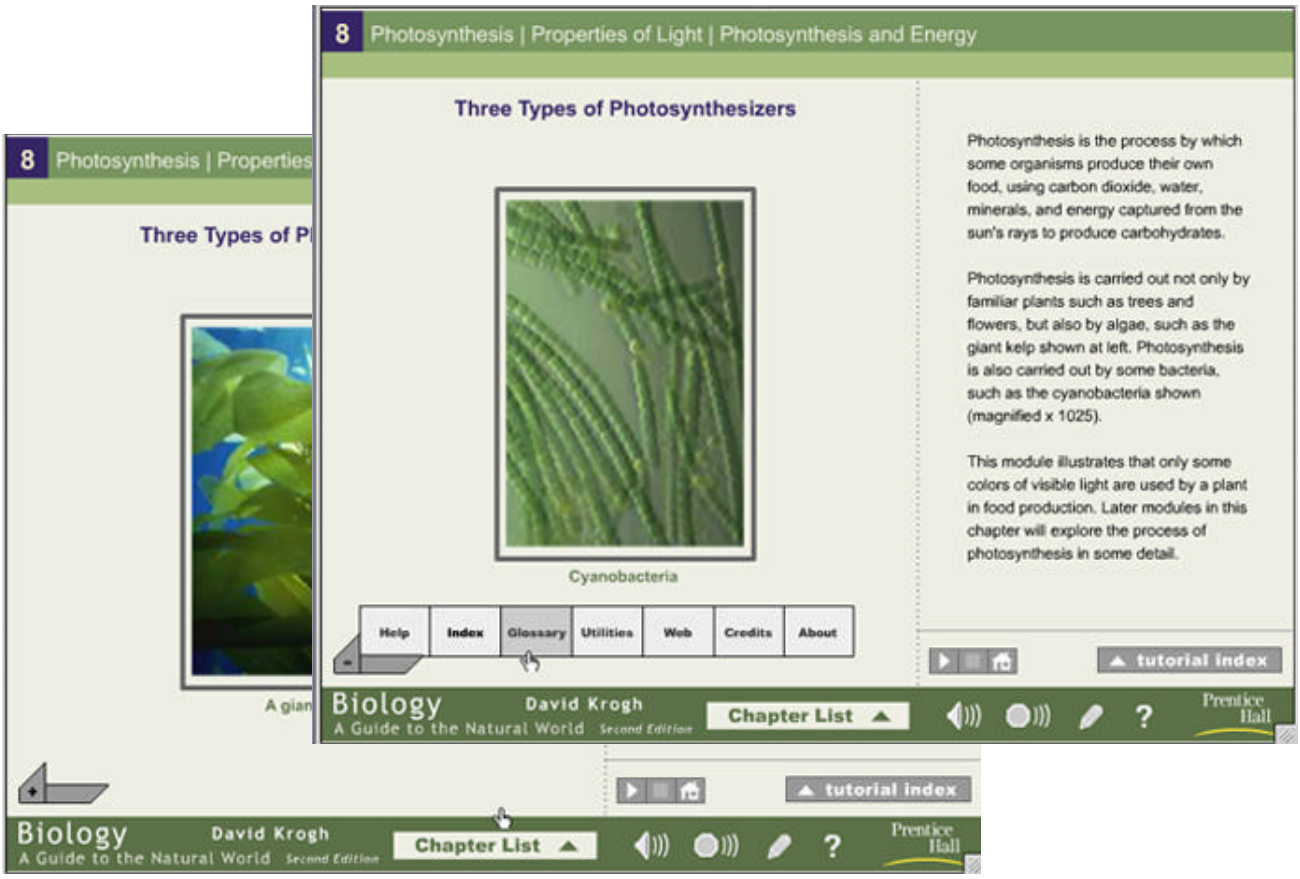


Fig.4 | http://csep10.phys.utk.edu/krogh/

The Biology template illustrates the difference between site navigation, unit navigation and tool access.
The tool menu bar can be moved anywhere on the desktop.
All navigational elements are fixed and consistent.

True vs. Evaluative Audiences

While navigation and tools were differentiated, navigation was considered primary. In all cases, every effort was made to make the navigation "intuitive". In other words, the viewer should not need to learn to utilize a system of visual symbols to move through the information. Movement through the information would be based on a pre-existing information. This posed a design problem in that there was a "true" audience; the students who would need to access the information, and an "evaluative" audience; faculty and publishers who had to approve the project and who had the ability to make global changes. In several instances, the "evaluative" audience showed itself not to be as computer literate as the "true" audience.

In terms of interface design, the "true" audience was much more experienced in non-linear navigation than the "evaluative"

audience. This generated some very interesting discussions about the role of design and the role of the “client” in the design process.

In figure 1 the template for the Genetics project is outlined. While the author does not support the notion that all sites should have the same gestalt, the author does present a template that provides a good starting point for projects with large, complex information sets.

Goals

A primary goal of the university is to create life-long learners. The web experience helps to reinforce this attitude. Students do not expect the instructor to have all the answers. Students understand that they are expected to act as “real” designers. They must define the problem, then explore possible solutions. There is not one “right” solution, there are many possibilities, and they must choose the best one. We used to have trouble getting students to take the production class seriously. The students felt that if they could generate an image on the computer, they were done. The fact that the students were working with programmers on these projects and they saw firsthand how their “vision” could be altered if they were not comprehensive enough in their “electronic sketching”. Working as part of a team on a very large project gave them an appreciation for the effort involved in getting a piece produced.

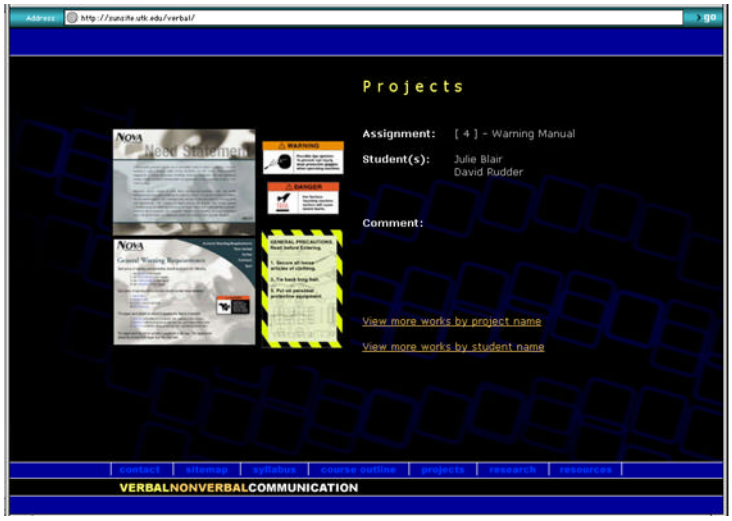


Fig.5 | http://sunsite.utk.edu/verbal

The Verbal/Non.Verbal site illustrates a team taught class with a colleague in Technical Writing. For this project writing students and design students made teams that solved the various problems verbally as well as visually. The goal was to have the students explore the best use of various forms of communication in a variety of situations.

Evaluation

These projects are successful on a number of levels; students participate in a capstone experience where they can apply their chosen area of research (design), work as part of a team and generate work that improves the academic environment for all Liberal Arts students. In addition, students who have graduated from DesignCenter have been calling. They consistently comment that they are amazed that when they show their portfolio, professionals want to talk about their DesignCenter work (after all,

this is not the “coolest” stuff in their book). The professionals want to know, How did the student enjoy working as part of a group?, How did the student interact with the client?, How did the student balance their research with their visualization? How did the student solve the technical aspects of the problem?

My favorite part of these projects comes when we are evaluating roughs and the organization of the information and I can refer the student back to a visual exercise that they produced as a beginning design student.

At that moment, everything connects.

The students understand that this is not about the computer,
it is not about typography,
it is not about imagery;
it is about integrating all of these tools,
to enhance communication.

These projects would not have been possible without my collaborators:

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