

# Syllabus

## Faculty & Student Usability & Focus Group Findings Inform Digital Teaching Library Interface Requirements

David Gillette, Ph.D., Associate Professor, English Department, California Polytechnic State University, San Luis Obispo

Mary M. Somerville, Ph. D., Assistant Dean, Robert E. Kennedy Library, California Polytechnic State University, San Luis Obispo

### **User-Focused System Interface & Effective Design**

When designing a new system, designers often immerse themselves inside their creations and become so focused on perfecting the inner workings of what they are building they often ignore how the system presents itself to the “outside” world. This form of inner-focused design leads to the creation of obscure and hard to use systems, creating software interfaces that are difficult to understand, information systems that are nearly impossible to navigate, and service organizations that fail to provide service. To help designers focus on the outside aspects of their designs, usability testing and focus group analysis have recently become vital components to the software and computing system development. Usability testing, and especially focus group analysis, are also being employed in other forms of information and service organization construction. This paper looks at how basic usability testing and focus group analysis was incorporated into a web site redesign project, and then applied on a larger scale for a more extensive information system development project.

Thinking of the “outside” aspect of a system means designers understand that the iterative design process of design, development, testing, and re-development needs to be continually aware of the needs of the system’s user. Effective usability evaluation reveals how users interact with various system design choices. Ideally, the information gathered from a usability study helps to set guideposts for the redesign and development process to ensure that the needs of users are always being considered. To better explain what we mean by usability testing and focus group analysis in this paper, we focus on a basic usability test of a university web site aimed at a faculty audience and how this was then initiated a larger library information systems evaluation and redesign.

### **Web Redesign Project Inception**

During Fall 2003, the topic of web accessibility for information resources at California Polytechnic State University (Cal Poly) came up for discussion in the technology guidance and recommendation committee for the university. A number of committee members were concerned about the confusing manner in which the university community communicated with itself. Specifically, many committee members noted that the university web site, especially the portion designed for faculty use, was in serious need of revision.

Dr. Gillette, serving on the committee at that time as the representative for the College of Liberal Arts, agreed to run a usability study of the current site. Results would be summarized in a report for the committee that would also be provided to the information services staff at the university. In January 2004, Gillette focused one of his courses on the university web site usability test. Dr. Somerville joined him as a project partner who secured library facilities space and provided staff technical and logistics support. During the next few weeks, we worked directly with 14 Cal Poly students to design, schedule, then run a week-long usability test of the central Faculty Resources page, which was at that time linked from the main page of the Cal Poly web site.

### **Constructing and Running a Usability Test**

We tested 19 faculty members selected from all across campus, representing a wide range of disciplines, divided between new and established faculty (9 new faculty, 10 established faculty). We tested 8 women and 11 men, and the ages ranged from early 30s to late 60s. All the test subjects were assistant, associate or full professors with earned doctorates. We used many of the testing techniques recommended by Steve Krug in his basic, but extremely useful book on web design, "Don't Make Me Think." We also made use of recommendations for the fine points of usability testing provided in the usability text by Carol Barnum, "Usability Testing and Research."

To test how faculty members (hereafter referred to as "users") interacted with the web, we created a usability testing facility in a computer lab in the university library. Each test took an hour to run, from greeting users and explaining the test to them at the start, to taking them through a series of follow up questions at the end. We tested users individually. Users sat at computers connected to the Internet. We mounted a microphone on the computer to record users' comments as they navigated the web site. The microphone was connected to a video camera recording the user's screen activity from a twin monitor set behind the user. This way the camera was not trained on the users to keep them from becoming too conscious of the recording process.

A student sat beside the user and, reading from a pre-prepared script, this student (who we called a "prompter") would guide the user through a series of scenarios that asked the users to find different pieces of information on the web site. The prompters' role was to direct users from activity to activity, and to prompt users to vocalize what they were thinking during the process. Prompters were trained to be very neutral in their prompting, and to stick to the script so they would not adversely bias or overtly influence the way the users interacted with the web site.

### **Library Systems Redesign Project Inception**

While running this usability test, we realized that the information system we were testing was similar, in many ways, to the overall information system provided by the library itself, and its role as "communicator" and "information resource" for the entire campus. We therefore began to plan for ways to "scale up" our basic usability test and its integration with system testing, design and redesign to apply to the entire library information system. This idea recognized the value of inculcating appreciation for user recommendations into redesign efforts. Our specific project sought to develop a

replicable and scalable process for obtaining these insights interactively, throughout the building and rebuilding process. Since the library was planning to commence its Digital Teaching Library project, beginning with a Learning Commons, it was chosen as the beta test site for this hybrid methodology, as its web presence shared many of the problems characterizing the university's site.

### **Academic Site Design with an Internal Audience Focus**

While web sites for universities share many of the same problems and concerns that can be found on any large-scale commercial web site, they have specific problems of their own that often bedevil even the most well planned forms of evaluation and redesign. Since many universities tend to promote the idea of "openness" not only as a pedagogical goal, but also as an organizational structure, university web sites often must serve a wide range of audiences and needs, many of which are often in conflict with one another. As Barnum notes: "Academic Web sites have both an Intranet (internal) and an Internet (external) audience...The most common problem of academic Web design is that the design reflects the hierarchy or structure of the college or university, making the information most relevant to the various audiences difficult to locate." (Barnum)

Many university web sites are usually constructed by a diverse collection of designers that range from well-trained professionals dedicated to full-time web design, to harried faculty trained only in the basics of web design, to students of all skill levels who come and go with every new academic year. As a result, university web site design is often a hodge-podge of visual, textual, and information-structure design. In many cases, the first few pages of a university site are coherent and follow accepted design guidelines, but when users explore deeper, they often discover a slightly chaotic collection of page designs.

Oftentimes, library systems reflect the same limitations and constraints of standard university web-based information systems. Libraries, which typically focus inward, display their inward orientation through the manner in which they present information in their websites. In many cases, the content on a library web site can be so intensively library-centric that it leads users to see the entire library system as insular and obscure. In contrast, by using externally generated perspectives that arise from user-focused design and testing as a guide for presenting the library's public face, our experiences suggest that libraries can demonstrate public value through combining their knowledge integration proficiencies with interactive co-design methodologies. This is best practiced within an enterprise-level systems thinking context.

### **Testing Goals & Discoveries**

When designing this usability test, we noted that many web usability studies find that users tend to access information structures using two fundamental search methods (Krug and Barnum):

*Noun-Centered Searching*—Users who are familiar with an organization or an online data set tend to initiate their search by looking for familiar titles, document names, and organizational divisions. These users look for nouns. For example, to find a travel

reimbursement form, this type of user first looks for the name of the office that she knows (usually from previous experience) handles or distributes these forms to faculty.

*Verb-Centered Searching*—Users who are new to an organization or approach an online data set for the first time tend to initiate their search by looking for familiar actions, looking for listings of familiar activities. These users look for verbs. For example, to find a travel reimbursement form, this type of user first looks for verbs related to travel or reimbursement, looking for the forms directly connected to this activity and then, secondly, to discover which office will handle the completed form.

A pre-test summary of the site's design revealed to us that the internal audience design issue, as well as the noun-centered versus verb-centered design issue, were clearly present in the Cal Poly faculty web site. Our test was designed to examine how faculty actually used the site (noun searching versus verb searching), and how different faculty reacted to the internal audience design aspect of the system's construction. We were especially interested in examining the different use patterns and evaluations provided by the new faculty versus the established faculty, and older faculty versus younger faculty. We did not test for gender differences in usability of the site.

The results of the test did verify for us that indeed the noun-centered vs. verb-centered method of searching was almost perfectly divided between established faculty (noun-centered) and new faculty (verb-centered). The verb-centered users (for the most part, new faculty) immediately went to the search engine element of the site to conduct a keyword search, often using verb-driven keyword inquires. The noun-centered users (for the most part, established faculty) instead carefully read through the noun-centered headings to find the information they were seeking. We also noted that this split was evident between older faculty and younger faculty, with the older faculty relying upon noun-centered searching and use of the site's presented information structure (links, headings, etc.) and young faculty relying upon verb-centered searching and use of the search engine and quick skipping through the engine's results page to find information.

### **Connecting Findings With Implementation**

At a state university, top-down control over how the faculty, students and staff present themselves and their programs is nearly impossible to maintain, and is also generally considered antithetical to the organizational culture of most universities. So, the problem arises: how can a university systemically ensure that its web-centered information structure is truly useful? Making all those responsible for web design aware of the usefulness of usability testing seems to be an initial step toward developing a solution.

To ensure that the results of our test were put to use, we promoted the idea that this was to be just the first of many tests and re-design processes to come. The goal, therefore, was to not only test what was currently up on the web, but to also begin the education process within the university itself in how to make a usability testing and revision process a central component of all university web design projects. Since absolute control over all web design and structure maintained by a central office or agency on campus was not a realistic or desired solution for the problem, we decided the best way would be to educate designers and developers in a bottom-up fashion—to encourage good design through

educating designers about the usefulness and practicality of making usability testing an essential part of the web design process.

Concurrently, the library was engaged in usability testing for a vendor's "out of the box" federated search engine. To help customize the interface to better meet the needs of Cal Poly faculty and student users, library public services and digital services staff members decided to run a usability test of the interface. The library staff began by running some practice usability tests that quickly revealed how unfamiliar they all were with properly interpreting the video taped findings from the tests. Therefore, the library staff resorted to focus groups that used guided dialogue to encourage the group to more fully explore the needs of the library systems' potential users. The university-level usability test results prompted a follow up focus group investigation of selected findings, into which library specific questions were embedded.

### **Defining Future Goals**

For the faculty web site, many of our short-term recommendations for site redesign were immediately put in place (for example: making the search engine more prominent, renaming categories with a verb-centered search technique in mind). Most importantly, the usability test initiated a series of ongoing test, evaluation, and redesign processes for the rest of the Cal Poly web site.

For the library, the results of this test encouraged planning a Digital Teaching Library interface based on data-driven design and development principles. The user-centered web portal would digitally link teaching, collections, research, and services. Through application of staff members' digital knowledge integration proficiencies, within a library organization culture that encourages learning, staff now stand poised to co-design the foundational information architecture to accommodate the seamless integration of digital collections (including licensed electronic databases, data sets and other aggregated sources, and architectural archives), digital tools (including federated search engines such as Google Scholar), and virtual services (such as 24/7 AskNow and eReserves).

As a result of this usability testing work, the learning accrued among research collaborators both reinforces outward focus and data-driven thinking. It encourages relearning that usability studies, enhanced by focus groups, should be part of a dynamic, ongoing design process, not just a one-time effort. By reporting on the results of this test to all the designers involved in the process we managed to "get people's attention" and used the research results to immediately make needed changes. The ultimate goals of this process are 1) to ensure we create, across campus, a culture of assessment in which bottom-up research is ongoing, and 2) to infuse the user focused underpinnings of this design approach into a variety of university communication initiatives for both print and screened presentation and distribution.

### **References**

Barnum, Carol. (2001). *Usability Testing and Research*, New York, NY: Allyn & Bacon.  
Krug, Steve. (2000). *Don't Make Me Think*, Berkeley, CA: New Riders Publishing.