

## **Much Ado About Usability**

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### **Introduction**

Web site usability testing throughout the course development cycle saves time, reduces development costs, and ultimately results in a better learning experience for students. During 2001, a team of instructional designers, technologists, media specialists, and administrators at the Penn State World Campus created a new course design template for online courses and then conducted a web site usability study to assess its new features. This paper describes the usability testing process and provides recommendations for enhancing the usability of online courses.

### **Methodology**

Usability studies can be conducted without great expense or expenditure of time since the majority of usability problems can be uncovered by a group of five or fewer participants. In fact, testing with more than five participants results in diminishing returns (Nielsen, 2000), and small tests that are conducted throughout the development process can reveal significantly more problems than a single test involving a large group of users (Krug, 2000). In our usability study, six of the 12 participants were assigned the role of prospective student while the other six participants acted as enrolled students. This division of roles and assigned tasks was necessary since the course template was originally designed to serve both audiences.

Different usability test methodologies yield information about different aspects of a site, and tests using multiple methodologies provide more information than those incorporating only one (Pearrow, 2000). Questionnaires provide background information about test participants—representative target users—but do not uncover specific task-related problems with a site. Similarly, card sorts elicit valuable data on site organization and labeling, but results can be as varied as the individuals participating in the test. To find specific task-related usability problems, users should be observed as they interact with the site. Typically, participants are assigned a set of tasks to complete while observers note the time on task, the number of mouse clicks involved, and whether the task was successfully completed. Additional qualitative information can be gathered by adding a “cognitive walkthrough” component, where participants are asked to speak their thoughts while completing the assigned tasks.

We utilized four methodologies in this study: a background questionnaire, a card sort, a cognitive walkthrough, and an exit interview. Participants proceeded individually through the usability tests. The background questionnaire was designed to help us gauge the computer skills of the participants. In the card sort, participants were asked to define and categorize the menu items that we had chosen for our course template. The enrolled group was given our chosen menu categories to work with, while the prospective group was asked to create their own categories. The menu items and categories were written on index cards for easy organization, hence the name card sort. In the cognitive walkthrough, prospective students were asked to perform four tasks and enrolled students were asked to perform 10 separate tasks within the course web site. For example, the prospective group was asked to find the date of the first exam, while the enrolled group was asked to navigate to the first page of Module 1. Participants expressed their thoughts aloud while their comments and actions were videotaped and noted by the observers. The data gathering for each participant was completed with an exit interview, which consisted of five questions about the site and its ease-of-use. We also requested general feedback and suggestions for improvement at this stage.

## Results and Recommendations

The background questionnaire indicated that the participants had roughly similar computer backgrounds, with most identifying themselves as being comfortable with computers. We found the exit interviews particularly helpful in generating solutions to usability problems uncovered in the cognitive walkthrough. The card sort and the cognitive walkthrough generated a large amount of information on the usability of our course template and were central to improvement of our site design. Due to page constraints, only the most significant and generalizable results from these two methodologies will be described here.

### Card Sort Results

**Result 1: Some menu item wording was unclear.** Participants were confused about the meaning of some of the menu items. For example, our menu included an item titled “directions,” which was a list of directions for using course tools such as e-mail and the bulletin board. When asked to describe what they thought this item was referring to, answers ranged from “how to do something” to “concrete contents” with a number of participants simply saying the title was too vague to accurately describe. In other cases, we were using distance education jargon that was clear to us, but not to those unfamiliar with the field. One example was the menu item “IL Student Guide.” Out of all the participants, only one knew that this was a student guide of general policies for independent learning students; everyone else simply stated that they didn’t know what this item was. Furthermore, no participants correctly described the menu item name “Online Diversions.” Even menu items that seemed clear to most students were still confusing to some participants. For example, while most knew that “lessons” was a link to the course content, one individual thought “lessons” would link to a syllabus or schedule.

**Recommendation 1.** Be as clear as possible when referring to course components in menus or other site navigation. From this study we discovered that names for menu items must be chosen carefully in order to provide clear direction. Catchy phrasing (like “Online Diversions,” in our case) and distance education jargon should be avoided. However, we do recognize that in certain cases, creative wording is necessary to reinforce the metaphor behind the organization of the site (such as the “classroom” metaphor or the “personal organizer” metaphor); in these cases, we suggest that a description of each course component be easily accessible from within the site.

**Result 2: There was little consistency between participant-generated categories.** The enrolled group was asked to classify 30 menu items using the categories we provided. “E-mail” and “bulletin board” were the only two items that all participants assigned to the same category—“Communications.” There were nine other items that the majority of participants categorized consistently. Most participants did not classify the remaining 19 items according to any one model. When the prospective group of participants defined their own categories, there was even less consistency. For instance, there were only 8 items that more than 50 percent of the participants placed in similar groups. At best, only two-thirds of the participants agreed at any one time. This result led us to question the value of grouping similar items under headings in the course menu.

**Recommendation 2.** Although collapsible menu categories and nested menu items conserve space and are visually appealing, we recommend that such features be avoided in course Web sites. Based on the results of this study, we chose to limit the number of items in the main menu so that the menu could be skimmed easily. A shortened menu eliminates the need for students to search through our predetermined categories to find a specific course component; it also avoids the use of pop-up menus or other dynamic HTML that might not be accessible to students with disabilities. To shorten our course menu, we decided to include only those links that would be used repeatedly throughout the course. We then created a space for links to course components used less frequently (such as orientation materials, viewing tips, and instructor biographies) on the course home page.

**Result 3: Certain menu items could be interpreted differently based on user expectations.** Our course menu contained an item named “sample content,” which linked to an example lesson from the course. In the card sort, some participants wrote similar definitions for this item, such as “example of a lesson,” showing that they had a similar conceptualization of the site. On the other hand, some had a completely different outlook, instead describing the item as a “sample/example of a report/presentation” or “example of works like those student is supposed to create.” While these responses could not be strictly attributed to the participants’ roles of prospective versus enrolled students (i.e., not all prospective students thought this item would be an example of a lesson, and not all the enrolled students thought it was an

example of student work), we were struck by the fact the results still fell into two different perspectives. Similar findings from other menu item definitions caused us to consider the different ways prospective students and enrolled students would use the site.

**Recommendation 3.** One site should serve only one function. Single-function sites are easier to design, maintain, and most importantly, use. We ultimately chose to create two separate Web sites for each course, one for the prospective students and one for the enrolled students. Certain items, such as sample materials, a full course syllabus with assignments, instructor information, FAQs, and orientation materials were relocated to the new prospective student site.

### **Cognitive Walkthrough Results**

**Result 4: Participants did not always realize that they had completed a task successfully.** In several tasks, both prospective and enrolled students had actually navigated to the correct web page but did not see the information they needed—and so did not think they had completed the task. This happened, for example, when the prospective students were asked to find enrollment information and also when enrolled students were asked to find help downloading software for the course. These results prompted us to find ways to reorganize and streamline auxiliary web pages for quick and easy information retrieval.

**Recommendation 4.** We recommend that all pages in a course Web site be clearly labeled so that the student knows where they are within the course at all times. This labeling must also be consistent throughout the course in terms of appearance and terminology. In addition, course Web pages should be constructed so that the most important information is written concisely and prominently positioned near the top of the page. Extra information should be removed, or if necessary, relocated to the bottom of the page or to linked files. In doing so, you might even find that some additional descriptive material is not necessary at all!

**Result 5: Students did not understand directions on the course Web site or preferred to operate through trial and error.** No students were able to successfully retrieve assigned readings from an electronic reserve reading system at the Penn State library. This task involved multiple steps, where students were first asked to determine what readings were required for a particular module, and then to access one of these readings from the library. Completion of this task would require participants to interface both with our site and the library database. We provided step-by-step directions for using the library site, but most students did not use these instructions, even after they became hopelessly lost. As a result, we needed to find a way to provide directions so that students used them.

**Recommendation 5.** Directions must be included up front in order for students to use them. As in Recommendation 4, we realized that we needed to remove all extraneous information within and surrounding the directions for our course tools. We then placed all directions in a central “Getting Help” location. In addition, we realized that adding multiple access paths to the directions would help students retrieve the information as needed.

### **Conclusions**

While instructional designers and Web developers endeavor to “think like their audience” when creating an online course, they are so familiar with the information and terminologies used in the field that stepping outside of their roles is not easy. Web site usability testing led our instructional design unit to see our courses through student eyes, and the data acquired through this study fed an iterative template design process. Although distance education providers rarely have additional staff and resources to dedicate to projects outside the normal scope of activities, questionnaires, card sort activities, observations, and interviews require nothing more than participants, office space, a computer, and traditional office supplies. Even these “quick and dirty” usability tests will improve the learning experience as well as add to the collective knowledge of the design staff.

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## References

Krug, S. (2000). *Don't make me think: A common sense approach to web usability*. Indianapolis, IN: New Riders Publishing.

Nielsen, J. (2000). *Why you only need to test with 5 users*. (2000, March 19). Retrieved October 23, 2001, from <http://www.useit.com/alertbox/2000319.html>.

Pearrow, M. (2000). *Web site usability handbook*. Rockland, MA: Charles River Media, Inc.

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