PEERRS
USABILITY TEST

Team E
Kathe Frassrand
Trek Glowacki
Amy Grude
Tonya McCarley

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EXECUTIVE SUMMARY

Product and Goal

In 2003, the University of Michigan implemented the online Program for Education and Evaluation in Responsible Research and Scholarship (PEERRS) system. This study was conducted to evaluate the navigation and usability of the system. The goal was to examine the system from a user perspective in order to provide suggestions to the administrators of the system for the next iteration of design.

Methods

Five subjects participated in this study. Participants were invited through email and individual contact with the researchers. Participants were selected based on the profiles identified by the research team. This information was confirmed during the pre-screening process. The participants were asked to complete tasks that closely matched the actual process of using PEERRS. The locations of all of the tests were office environments that reflected a key scenario identified by the research team. A pre-questionnaire and post-questionnaire were used to measure the participants' responses to the system. Debriefing questions were also used to assess the participants' experiences.

Findings

This usability study revealed subjects were able to successfully use several features in PEERS. These features are:

- 5 out of 5 subjects recognized and utilized Kerberos

- 5 out of 5 subjects understood how to take a quiz

- 5 out of 5 subjects effectively used the left-side navigation menu in the module to locate additional information

- 4 out of 5 subjects negotiated the navigation of the modules successfully

Ten significant issues were uncovered during this study. They are listed in order of severity rankings, from the most severe to the least severe, with the most severe requiring attention first.

- 5 out of 5 users were not expecting the FAQ page to open in a different window

- 4 out 5 users found the navigation in the "Case Study" segments difficult and/or confusing

- 3 out of 5 users were not able to find help
- 3 out of 5 users did not know how to classify themselves during the registration process
- 3 out of 5 users did not find the link to confirm their profile information easily
- 3 out 5 subjects experienced visibility issues with the Exit Test link due to screen resolution and/or size
- 2 out of 5 users expressed concern and uncertainty regarding how long filling out the profile would take
- 2 out of 5 users did not know how to Start PEERRS
- 2 out of 5 users had trouble starting the module
- 1 out of 5 users could not locate the quiz within a module

Explanations of the severity rankings for each of these issues are discussed in Results. Recommendations are presented at the conclusion of each task addressing these issues.

INTRODUCTION

Researchers at the University of Michigan are often required by the University to complete online training courses and subsequent certification exams concerning different aspects of conducting responsible research. The University of Michigan has determined that this information is of critical import. In some cases, the University will withhold grant money from primary investigators who fail to complete the training. Additionally, some outside funders require this training and certification as a prerequisite to release of funding. Because this training is requisite, it is imperative that the users of the system can successfully complete the tasks needed to receive certification.

This report will examine user performance on the PEERRS website and evaluate areas where the design of the website prevents users from partially or wholly completing the tasks they need to complete for certification. The study focused on regular tasks that users of the system would perform, in order to identify problems that users may have. The researchers then used their observations and subject comments to make suggestions on improvements to the system.

PEERRS Description

The Program for Education and Evaluation in Responsible Research and Scholarship (PEERRS) online system was created to provide efficient delivery of information, training, and certification testing to the University of Michigan research community. It is specifically designed to inform, train, and test researchers in a variety of areas relating to responsible research practices.

The system consists of information links, training modules, and test modules. Each training module consists of 20-30 pages of content and additional case studies. Lists of additional resources are also provided. Users can either utilize the training modules prior to testing or choose immediate testing. A user can retake the tests until a passing score is achieved. All users who have successfully passed one or more module certification tests are listed in a database accessible by any user with a valid UM Kerberos username and password, or appropriate UM *Friends* account.

The University of Michigan requires that all Principal Investigators (PIs) and Co-Principal Investigators (Co-PIs) in research projects with start dates of June 1, 2005 and later, be certified through the online PEERRS system. Individual schools and departments may have additional requirements. Furthermore, supplementary faculty, staff, and students *may be required* to complete PEERRS training and certification *as determined* by project PIs on an individual basis. UM PEERRS certification is valid for three (3) years and only for University of Michigan research projects. Research projects spanning additional universities may require researchers to be certified at those institutions, in addition to UM PEERRS certification completion. The PEERRS system begins sending automatic email notification of impending certification expiration beginning thirty (30) days prior to that date.

The National Institutes of Health (NIH) also requires training and certification for PIs, Co-PIs and other "key personnel' (as defined on the NIH Website) in research projects involving human subjects. Not fulfilling this requirement results in the withholding of funds allocated by the NIH. The UM PEERRS system was designed to comply with NIH guidelines and currently fulfills NIH requirements.

PURPOSE

This study was conducted to evaluate the navigation and usability of the UM PEERRS system. The goal was to examine the system from a user perspective in order to provide suggestions to the administrators of the system for the next iteration of design.

TEST PLAN

Test Subjects

There were five test subjects with the following University affiliations: one undergraduate student, one master's student recently admitted to the PhD program, one faculty member, and two staff members.[1] Subjects were recruited through email and had either academic or personal contact with the facilitators. Subjects received a $10.00 gift certificate to Amazon.com as incentive. All testing was completed on Thursday, March 16, 2006 and Friday, March 17, 2006. All subjects are residents of Ann Arbor, MI and had never used the PEERRS system previous to the study. A summary of subject information can be found in Table 1 below.

Table 1: Test Subjects

Subject	S1	S2	S3	S4	S5
Age	30	28	21	31	53
Sex	M	F	F	F	F
Affiliation	Masters Student (Incoming PhD)	Staff	Undergraduate Student	Faculty	Staff
Department(s)	School of Information, School of Social Work	School of Information	Literature, Science, & the Arts	Ross School of Business, Business and Information Technology	School of Information & Others
Operating Systems	Windows & OS X	Windows & OS X	Windows & OS X	Windows	Windows & OS X
Familiarity with the Internet	Very Familiar	Very Familiar	Very Familiar	Very Familiar	Very Familiar
Experience with the Internet	Very Experienced	Very Experienced	Somewhat Experienced	Somewhat Experienced	Very Experienced

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[1] The subjects for this study were determined to fit the general user profiles for this system based on a survey conducted for a previous report for this project.

Test Equipment and Software

Four of the subjects were tested on a 12" Apple PowerBook running OS X version 10.4.3. Three of these subjects used the laptop monitor and said they felt comfortable doing so. One subject used a 19' monitor with screen resolution 1024 x 768. One subject performed the tasks on her own office computer, a Dell running Windows XP with a 21" monitor. All subjects used an Apple mouse or a wireless Logitech mouse that was provided, except for the subject who performed the tasks using her own Dell computer and mouse. Figure 1 shows the setup for subjects SI, S2, S3, and S5.

Figure 1: Equipment Setup for Subjects

All four subjects using the 12" Apple PowerBook had a Safari browser window open to the first page of the PEERRS website in which they performed the tasks. An Apple iSight was connected to the top of the laptop or monitor, and the video and audio of the tasks was sent via a video iChat to the observers' computer, a 15" Apple PowerBook running OS X version 10.4.5. The subjects were not able to see the video window or that iChat was running, but were aware they were being videotaped and recorded. The observers' computer was connected to the testing computer via the Apple Remote Desktop application, also invisible to the subject. The observation computer was set up to receive both the remote desktop feed and the video/audio feed in one view. Both of these, next to each other, were captured simultaneously and recorded using Snapz Pro. Figure 2 shows the observation computer setup. The test computer and the observation computer were connected via wireless internet in the School of Information. The subject who used her own office computer was not recorded in any way due to a lack of wireless in the building. The tester took observation notes during the tasks. Please see Table 2 for a summary of equipment used. Figure 3 shows the screen of the observers' computer, connected to the test computer through Apple's Remote Desktop.

Table 2: Test Equipment Used

| Subject	S1	S2	S3	S4	S5
Test Computer & Operating System	Apple 12" PowerBook running OS X version 10.4.3	Apple 12" PowerBook running OS X version 10.4.3	Apple 12" PowerBook running OS X version 10.4.3	Dell Desktop running Windows XP	Apple 12" PowerBook running OS X version 10.4.3
Test Monitor	IBM 19"	Apple 12" PowerBook	Apple 12" PowerBook	Dell 21"	Apple 12" PowerBook
Test Mouse	Apple Mouse	Apple Mouse	Logitech Cordless Optical Mouse	Dell Mouse	Logitech Cordless Optical Mouse
Camera	Apple iSight	Apple iSight	Apple iSight	N/A	Apple iSight
Observation Computer & Operating System	Apple 15" PowerBook running OS X version 10.4.5	Apple 15" PowerBook running OS X version 10.4.5	Apple 15" PowerBook running OS X version 10.4.5	N/A	Apple 15" PowerBook running OS X version 10.4.5
Remote Desktop Application	Apple Remote Desktop	Apple Remote Desktop	Apple Remote Desktop	N/A	Apple Remote Desktop
Video Transmission Program	Apple iChat AV	Apple iChat AV	Apple iChat AV	N/A	Apple iChat AV
Observation Computer Screen Recorder	Snapz Pro	Snapz Pro	Snapz Pro	N/A	Snapz Pro
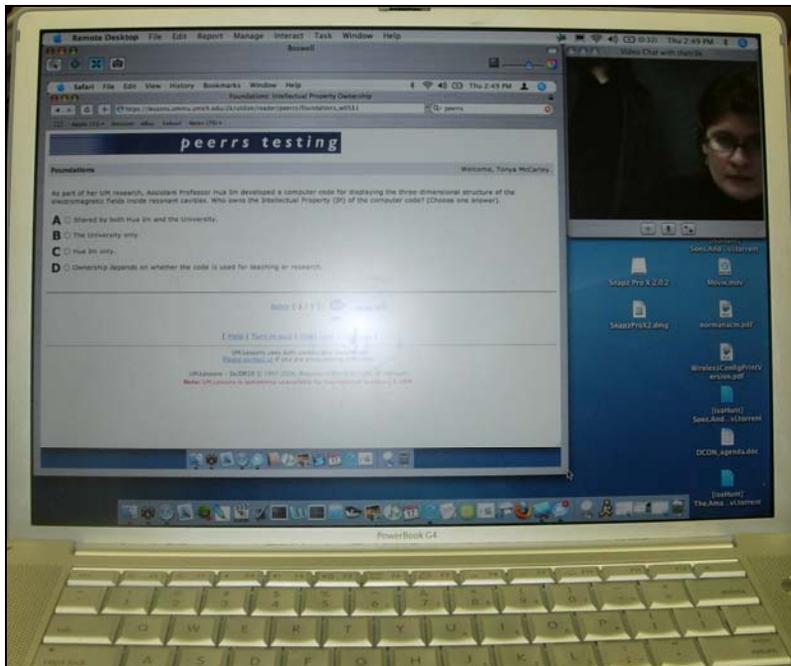
Figure 2: Observation Computer Screen with Remote Desktop and iChat Video

The test for S2 and S4 took place in their own offices, whereas the tests for S1, S3, and S5 took place in makeshift offices. Because the PEERRS user testing took place in a variety of locations and with different types of equipment, the facilitators were able to gather data that is more representative of a real world situation rather than a lab setting.

Test Plan Methodology

Before beginning, the facilitator introduced the subject to PEERRS and explained that the purpose of this study was to observe how they use the site to complete particular activities, how easy the site is to use and navigate, and what aspects of the application were liked and disliked. The subjects were informed, among other things, that their own abilities were not being tested, the session was being videotaped, and that they should feel free to comment on anything, negative or positive about the site. The subjects were instructed to "think aloud" as they moved through the activities. The script used for each test can be found in Appendix B. Before beginning the tasks each user filled out a questionnaire with demographic information and questions about their internet use. The questionnaire can be found in Appendix A.[2]

Each subject was given five tasks, listed in the following Table 3. Each task was on one sheet of paper, and they were handed to the subject one at a time in the order shown in Table 3.

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[2] The design of the questionnaires for this study follows Rubin's guidelines.

Table 3: User Tasks

Task #	Task
1	Please register yourself on the PEERRS system and make selections that most closely reflect you. Please talk out loud while you are registering.
2	Please select the first module to review. In the module, please complete the module by reading out loud the first and last sentence of each page.
3	Assume you want to leave the module and are unsure if you can return to complete it at a later time. Where on this website would you find that information?
4	Take the quiz for this module. Answer each question and complete the quiz. *Please do not be concerned with selecting the "right" answers.*
5	Return to the module and find information on "intellectual property."

In the interest of time, for Task 2, the facilitators often asked the subject to read only the first and last phrase of each page instead of the first and last sentence. Additionally, subjects were stopped in Task 2 approximately one-third of the way through the module. This allowed them to navigate through a representative number of pages in the module. This process enabled the facilitators to gauge navigation without focusing on content. It also provided the facilitators with enough information to identify when to transition to the next task. Task 5 was changed twice when subjects were given modules that the facilitators were not expecting to be listed first. A facilitator then replaced "intellectual property" with a category from the module the subject actually navigated through in Task 2.

Once the tasks were finished the facilitator asked the subject the following questions to assess their experience with the web site:
- How would you rate, overall, the ease or difficulty of the tasks and why?
- When you tried to use the help system, was it easy or difficult to find the answer? Why?
- What did you like the least about the web site?
- What did you like the most about the web site?
- If there is one thing that you would like the designers to change, what is it? Why?
- Would you use this web site again?

The subjects were also given a post-test questionnaire to assess how they would rate the difficulty of each task. They also evaluated how they felt about the site with categories such as Simple/Complex, Authoritative/Unreliable, Friendly/Unfriendly, and High Quality/Low Quality. The post-test questionnaire can be found in Appendix C. The debriefing questions provided an opportunity for the subjects to discuss their experience with PEERRS in their

own words. Each test including instructions, debriefing, and questionnaires lasted approximately 30 minutes. The participants were given a personal thank-you card letting them know they would receive a $10.00 Amazon gift certificate via email.

RESULTS

This usability study revealed users were able to accomplish four tasks with confidence. Results of these successes are displayed in the table below.

Table 4: Tasks Completed with Confidence

Task #	Subtask	Degree of Success (5=Very Successful, 1=Not Successful)
1	Logging into U of M Kerberos account	5
4	Navigating through the quiz	5
2	Using the left nav bar to locate specific information	5
5	Navigating through modules (non-case study pages)	4

The data from the recordings and observations was compiled and analyzed by the researchers, who assigned a numerical value of severity to each task. The number represents the degree to which the user had difficulty with the task and the implications this has for overall success using the system. The severity ranking is also reflective of the researchers' opinion based on observations and implications throughout this study. The tasks and rankings are summarized in Table 5. Each task listed below will be discussed in detail. Following each recommendation there will be a difficulty rating indicating for developers the level of difficulty to make the recommended changes. The scale is 1 to 5 with 1 being easy and 5 being difficult.

(Next page, please.)

Table 5: Severity of User Difficulty in Completing PEERRS Tasks

Task #	Task	Severity
3	Users demonstrated difficulty finding help	5
1	Users were confused and had difficulty classifying themselves while registering for PEERRS	4
2	Users found navigation through the case study pages confusing	3
4	Users were not always able to locate and exit the quiz	2
5	Users were not sure how to re-enter a module	1

The following table summarizes the tasks the users were asked to perform, the average time it took to complete each task, and whether or not they succeeded, as well as the average response for subjects' opinion on ease of use.[3] It is important to note that not all tasks were judged on the basis of time because the researchers were not evaluating the system for content in the modules.

Table 6: Results Summary Table

Task #	Task	Average Time to Completion (m)	Success Rate	Average Degree to Which Subjects Felt the Task was Easy (5=Strongly Agree, 1=Strongly Disagree)
1	Register for PEERRS	4.01	2/5	4.2
2	Navigate through a module	N/A*	N/A*	4.2
3	Find Help	0:49	2/5	3.25
4	Navigate through the quiz	N/A*	N/A*	4.6
5	Return to a module and locate specific information	0:32	3/5	3.6

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[3] For opinion questions asked of the subjects in this study, a Likert scale was used with the following numeric equivalents: 1 = Strongly Agree; 2 = Agree; 3 = Neutral; 4 = Disagree; 5 = Strongly Disagree.

Task 1: Register for PEERRS

Registration for PEERRS accomplishes several goals, such as entering information into the system to determine which modules a user needs to complete and connecting the user's profile with her University of Michigan account. This way, the University can keep track of who has completed certification for each module. To register, a user must first click a link on the home page of PEERRS with the text reading "Start PEERRS." The user is taken to the standard University of Michigan Kerberos login page where she must enter her uniquename and password. Once authentication is complete, the user is forwarded to three "profile" pages. The first profile page includes department affiliation choices, the second contains Staff/Faculty/Student identifications, and the third asks about types of research being performed. Once all three pages are submitted the user can view the profile information she just filled out and either submit or go back to edit the information.

Task #	Task	Severity
1	Register for PEERRS	4

The problems identified by the researchers are as follows:

- Users did not know how to classify themselves while filling out the profile
- Users did not know how long filling out the profile would take
- Users did not know how to Start PEERRS
- Users had a difficult time finding the link to confirm their profile information.

Users' Self-Classification
Subjects selected boxes from the list in Figure 3. The colleges and departments are listed alphabetically, and although the instructions say to choose all that apply, subjects had a variety of difficulties with this section. S3, an undergraduate student in the College of Literature, Science, and the Arts was never able to correctly locate that selection because she was scanning the list for "LS&A". She did, however, select the box for "Public Health" because that is where she plans to do research in graduate school in the future. S2 also failed to correctly identify herself as being part of the School of Information. S5 was confused about what boxes to click because she has affiliations in many departments on campus.

Figure 3: Selection of Research Involvement

Though the instructions say to choose all that apply, the subjects did not always know that they needed to do so. Because the selection of profile items affects the modules that the users are required to take, mistakes in this section can affect the information received by users. It is possible that a failure to correctly complete the profile, much like three of five subjects did, would result in incorrect modules being shown and a lack of information the University feels is necessary for the research they are conducting.

Recommendations
The test subjects often had difficulty locating items in the list. Though the list is in three columns, there is nothing significant about these columns because the list of departments is in alphabetical order. In order to make it clear which departments and schools are available for choosing, they could be subdivided into categories that make sense cognitively. For example, one subsection could be a choice between "UM Ann Arbor", "UM Dearborn", "UM Flint", "I am not a student, staff, or faculty member", and 'Other". Everyone is able to fit into one of these categories, and the list is small enough to not be overwhelming. The departments could be broken down into sections such as biological sciences, social sciences, and arts. Regardless of what is chosen, further testing should be done to make sure users are able to correctly classify themselves.
Difficulty: 2/5

Users Did Not Know How Long the Registration Would Take
When filling out the profile pages to register for PEERRS, users were not sure how long the registration process would last. One user commented "I have no idea how many pages are here. It could just go on and on forever as far as I know." Though the instructions on the first page of PEERRS state that there are 3 pages, users are not reading and/or processing this information. Though this did not adversely affect the performance in registration, the subjects did not have a sense of where they are in PEERRS.

Recommendations

S1 read the following sentence out loud from the instructions: "The following three questions will be used to generate a tailored curriculum"; then 30 seconds later said, "As far as I know this could go on forever." This example illustrates that users are not processing the instructions even if they are reading them.

To overcome this uncertainty, each page of the registration could update the user regarding how far along she is in the process. For example, the first page could have the text "Page 1 of 3." This would let the user know where she is and how far she has to go.

Difficulty: 1/5

Users Did Not Know How to Register for PEERS

When given the task to register for PEERRS, which is the first task any user must perform, several subjects were not sure how to begin. Figure 4 shows the first page of the PEERRS web site. Though all subjects eventually clicked "Start PEERRS", it wasn't obvious that this is what they should do. S1 noted, "It's kind of weird that the start is clear down here. There's a lot of white space."

The process of registration is complicated by two factors. First, subjects were tested on different sized monitors. Those using the smaller monitors did not have the "Start PEERRS" link above the fold, or showing on the screen without scrolling. Additionally, the link is located on the bottom left side of the page. Typically, a button that means "move forward" is located on the right hand side of the page.
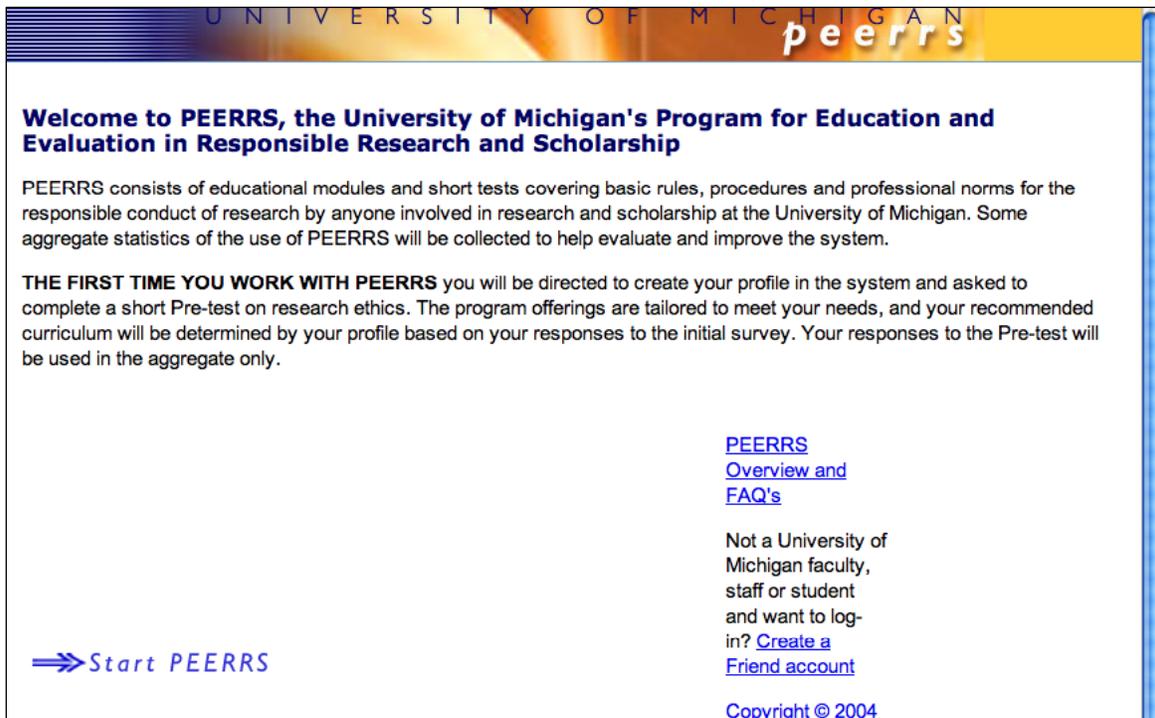

Figure 4: First Page of PEERRS Web Site.

Recommendations
This problem can be resolved with several simple changes. First, the link to begin PEERRS should be moved to the right side of the page. (The information currently occupying the right side can easily be moved to the left side.) Second, the link should be moved up so that is much closer to the text explaining the registration. Third, the link should be changed to something the more accurately represents what the user will be doing, such as "Register for PEERRS" or "Register and Begin PEERRS". Another option is to make the link a button that stands out more from the other links on the page.

One subject stated that if he could have the designers change one thing, it would be to re-work the "Start PEERRS" link so that users understand what they need to do next.
Difficulty: 1/5

Confirming Users' Profiles
Once the user has completed filling out the information for their profile they are taken to a page where they must confirm that the information is correct before moving on to the modules. It was not immediately clear to the subjects of the study that link in the bottom right-hand corner was the thing they needed to click to move on. Several of them had to scan the page for 15-20 seconds before realizing what to do.

It should be noted that although three of the test subjects failed to correctly classify themselves in their profile, none of them used the links on the confirmation page to go back and edit their choices.

Recommendations
The link that says "This is Correct, Proceed" is small and blends in with the rest of the text and links on the page. To make it more visible to users, it should be larger with larger text, or made into a button that visually attracts the user. The "Make changes to my profile" link should also be more prominent since it didn't seem that the subjects saw that at all.
**Difficulty: 1/5**
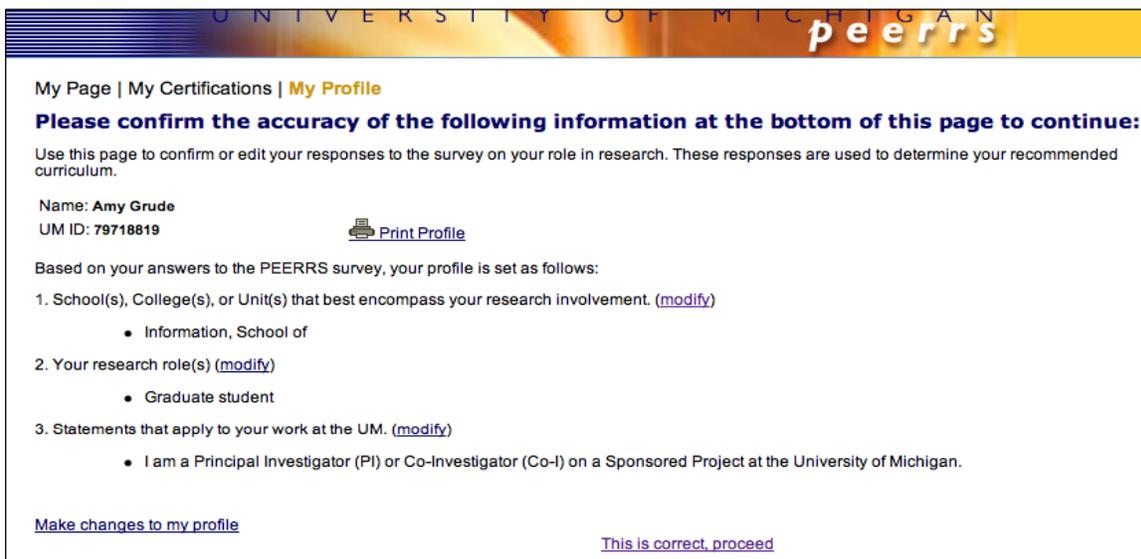
Figure 5: Confirm Profile Page

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Conclusions

The amount of time the subjects spent registering on PEERRS can be found in Table 7.

Three of the five test subjects "strongly agreed" that the registration process was easy when filling out the post-test questionnaire. Though they felt it was easy, two of those three failed to correctly identify themselves with their profile choices. One subject who also had difficulty with her classification "agreed" with this statement, and one subject "disagreed" with the statement. Overall, the subjects claimed that they found the registration process easy, even though in most cases they failed to complete it properly. This suggests that the registration process needs to be evaluated so that users both make the correct choices and know whether or not they are making the correct choices.

Table 7: Time to Completion and Success in Registration

Subject	Time to Complete Registration	Degree to Which Subjects Felt Registration was Easy	Numeric Response
1	4:04	Strongly Agree	1
2	3:51	Strongly Agree	1
3	4:09	Strongly Agree	1
4	*Not Available**	Agree	2
5	*Not Available**	Disagree	4
		Average	1.8

* Due to technical issues completion times were not available for 2 subjects. Consequently, a column has been added to indicate success or failure in the task.

Task 2: Navigate Through a PEERRS Module

There are three different ways users can navigate through each module. The first is by using "previous page" and "next page" links at the bottom of each page of each module. The second is by using the "previous" and "next" links in the top right hand side of each page. The third is by clicking on the categories in the blue navigation block along the left-hand side of the page.

Task #	Task	Severity
2	Navigate through a module	3

The problems identified in navigating through a module are:
- Some subjects had trouble starting the module itself
- Navigation of the "Case Study" segments of the module was difficult and/or confusing for subjects

Starting the Module

All of the subjects scanned the page and circled the mouse around when attempting to begin the module. While three of the subjects successfully clicked the "start module" link associated with the first module, 2 of the subjects were not able to do so and had to be shown in order to begin navigating through the pages. Figure 6 shows the table of modules and the options the user has for each.

One reason the subjects had trouble locating the "start module" link was that they assumed the name of the module was the link itself. Cognitively, it made sense that to view information on a particular topic they should click on the name of that topic. A second reason for the problem is that there is a lot of text on the page that all looks very similar. The blue of the link color is similar to the black text, and thus the "Start Module" link did not stand out to the subjects. They also were not looking for this link because they assumed they should click on the module title.

Recommendations

Removing the "Start module" link and making the name of the module the link to begin would alleviate this problem.

Difficulty: 1/5

Figure 6: Customized Page Containing Listing of Modules to Take

Priority	Module	Actions	Length (pages)	Certified Through
Required	Foundations of Good Research Practice	Start module | **Return to module** | Take test	29	-
Required	Research Administration	Start module | **Return to module** | Take test	28	-
Required	Conflict of Interest	Start module | **Return to module** | Take test	23	-
Recommended	Authorship, Publication and Peer Review	Start module Return to module Take test	19	02/01/2009
Optional	Human Subjects - Biomedical Sciences	Start module Return to module Take test	24	-
Optional	Human Subjects - Behavioral Science	Start module | **Return to module** | Take test	24	-
Optional	Human Subjects - Health Sciences	Start module Return to module Take test	25	-
Optional	Animal Subjects	Start module Return to module Take test	21	-

Navigation of the Case Study Segments of Modules is Confusing

The modules consist of different types of pages. While most contain textual information related to the topic of the module, some pages contain case studies where the user reads a scenario and then applies what they have learned so far to answer the question. On these pages, the navigation deviates from the "normal" navigation and has only a link to see the answer to the case study. Figure _____ shows the different navigation on the case study pages.

Each Page contains a
"< previous next >"
navigation element located at the
top of the page. It also contains a
"< previous page next page >"
at the bottom of the page.

Both of these navigation elements
move the user to the next page in
the sequence of pages.

< previous   xx of 29   next >

Page A

< previous page   next page >

Page B
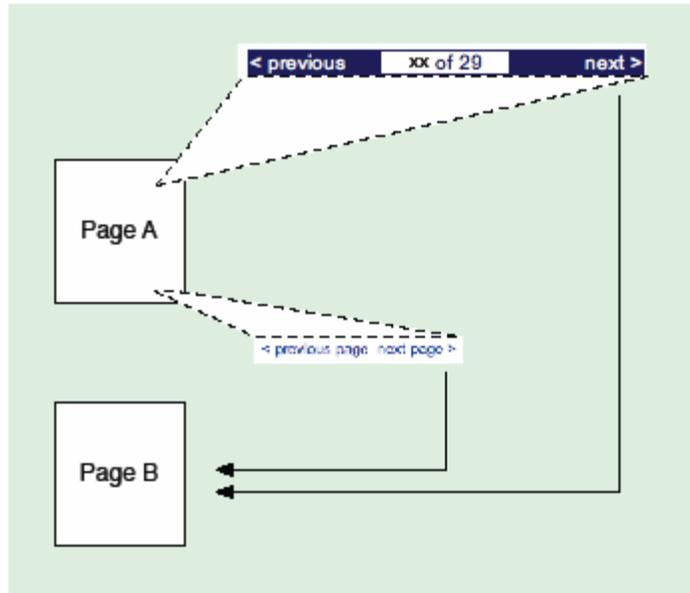
A breakdown in this navigation
occurs when "case study questions"
are presented to the user. In this
instance, the
"< previous next >"
navigation at the top of the page
moves the user to the next section,
bypassing all the questions and
answers.

The navigation at the bottom of the
page moves users to the
subsequent questions and answers
of the "case study" page.

After the final question/answer pair,
"next page>" takes the user to the
next page in the module.

< previous   xx of 29   next >

Page E

Q1

Q2

Q3

Page F
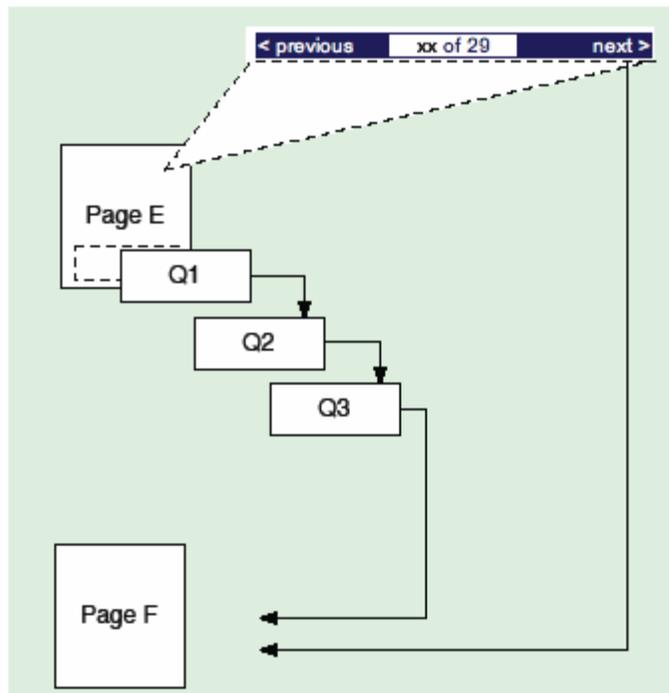
Figure 7: Case Study Navigation Flow Diagram

All five subjects expressed confusion and in two cases failure to correctly navigate through sections of the module. This confusion and failure led to:

- Subjects skipping segments of information
- Impeded progress on moving through the module
- Subjects were unaware of information located in the module

The reasons for this difficulty, which can be seen in figure _____ can be found in the navigational elements that differ from the navigational elements that the subjects used on every other page of the module. The subjects all navigated the module by clicking the "previous page" and "next page" links at the bottom of the page. However, when arriving at the case study pages, these links at the bottom are no longer present; instead, the user sees internal navigation for the page. Three of the subjects sought out alternate forms of navigation, causing them to skip segments of the case study entirely.

Recommendations
The module navigation should stay the same on each page, and the case study pages should be re-designed to be more intuitive for the user. The navigation within the case study should not look the same as the navigation in the regular pages of the module. In support of our recommendation, we note here a recommendation from UsabilityFirst.com: "[For example] studies have shown that blue-underlined text is the most reliable indicator of links and provide the most click-throughs. Using another color drastically reduces click-throughs and using graphics reduces the number even further. Another advantage to text links is that browsers support differentiating visited and unvisited links, which cannot be supported with graphics." (2005)
Difficulty: 2/5

Conclusions
Table 8 contains the subjects' feelings on the ease of navigation within PEERRS. Two of the subjects strongly agreed that the navigation was easy to use, and one subject felt neutral about the navigation being easy.

Table 8: Ease of Navigation Feelings

Subject	"The navigation in the PEERRS modules was easy to use."	Numeric Response
S1	Strongly Agree	1
S2	Strongly Agree	1
S3	Agree	2
S4	Neutral	3
S5	Agree	2
	Average	1.8

Task 3: Find Help

Based on feedback from interviews and survey results of previous PEERRS users, a key scenario for using the system became clear. Users revealed they often accessed the site during times that were not necessarily conducive to completing the modules or quizzes in one sitting. It became clear users need to understand the flexibility of the site which does enable users to leave the site and return to the same location in the module at a later date. In light of this, it is critical for users to be able to recognize and access help. For this purpose, the research team designed a task to determine the accessibility of this information.

There is no section labeled "Help" in PEERRS, but there is a tab labeled "faq" linked from the almost-always-present global navigation at the top of the page. The FAQ window contains instructions on how to complete tasks within PEERRS and answers questions about the system while letting users know how to contact PEERRS administrators if they have questions or comments. The "faq" page, which pops up in a separate window from the main page, can be seen in Figure 8. It should be noted that the acronym, FAQ, stands for Frequently Asked Questions. [4]

For this task, subjects were told to assume they wanted to leave their session but were not sure if they could save their place within the module and return at a later time. The words "help," "FAQ," or "faq" were not used in the task details.

Task #	Task	Severity
3	Users are unable to find Help	5

The problems identified in finding help are:
- Subjects were not able to find help
- The navigation within the page was difficult
- Subjects were not expecting the "faq" page to open in a different window.

Subjects Were Not Able to Find Help
Of the five subjects tested, only two successfully located the information requested in the task description. Table 7 shows the success or failure, time to completion (if applicable), and feelings the subjects had about finding this information. It should be noted that all of the subjects, as they spoke aloud, said they were looking for "help". The two successful subjects decided to click the "faq" tab after exhausting their search for help. It was not clear to any of the subjects that if they wanted more information on using PEERRS that the "faq" tab would contain this information.

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[4] For information about the importance of Help as a website feature, we consulted the Usable Web. (Peterson, 2000)

Table 7: Subject Data on Finding Help

Subject	Time to Complete Help Task	Degree to Which they Felt the Help Function was Useful	Numeric Response
S1	0:47	Agree	2
S2	0:50	Strongly Agree	1
S3	*N/A*	*No Response*	-
S4	*N/A*	Disagree	4
S5	*N/A*	Disagree	4
		Average	2

Subject S1, who was eventually successful in locating help, first looked around at the links on the blue navigation block on the left-hand side of the page. He stated that he thought there should be some kind of information about saving the place near the links "Print Module" and "Exit Module." After searching through the rest of the page, he clicked on the "faq" button. S3 never found the information as requested by the task, however, she did figure out the answer to the question through guessing and clicking "Exit Module." Once exited, she saw that there was a link she could click to return to the module. S4 and S5 were both not able to locate the information and did not click any buttons to take a guess at the functionality.

Recommendations
For this particular problem, the information needed could be conveyed more accurately to users by changing the "Exit Module" link to "Save and Exit Module." However, the overarching problem is that users who have a question or want help largely do not know how to find it. The "faq" tab should be renamed to something more intuitive, such as "Help" or "Help with PEERRS".
Difficulty: 1/5

Navigation within the FAQ Page is Difficult
Both subjects who found the FAQ page scrolled up and down looking for the information before locating the page navigation at the top of the page (see Figure 9). After searching the page unsuccessfully, the eventually scrolled to the top and realized there were navigational links there.

Recommendations
The first time subjects saw the page, they did not realize there were navigational elements at the top of the page. As mentioned above, the link color is similar to the text color, which means that links do not stand out as much as they could. Additionally, the navigation links do not resemble navigation in any other part of the site. To make it more clear how to move

through the page, it could be set up more like the left-hand menu in the modules pages. Also, the word "categories" could be changed to "Menu" or "Index" or another word that more clearly conveys the function of the links. Additional testing should be done with words and layouts to determine the optimal page design.
Difficulty: 2/5

Subjects Were Not Expecting the Faq Page To Open In A Different Window
Of the five subjects, two expressed concern that clicking the "faq" tab would cause them to lose their current location in PEERRS. S3 stated, "I'm afraid that if I press one of these buttons I'll lose where I am." In addition, S4 expressed a similar concern.

Recommendations
Users were concerned that if they clicked the tab labeled "faq", they would lose their place in PEERRS. One suggestion for this issue would be to supply a popup text box that informs the user as she mouses over the tab that "faq" will open in a new window. An alternative suggestion would be to include a standard icon on the tile bar of the "faq" tab illustrating two windows to indicate to the user that the "faq" will open in a separate window.

Figure 9: PEERRS FAQ Page
Difficulty: 1/5
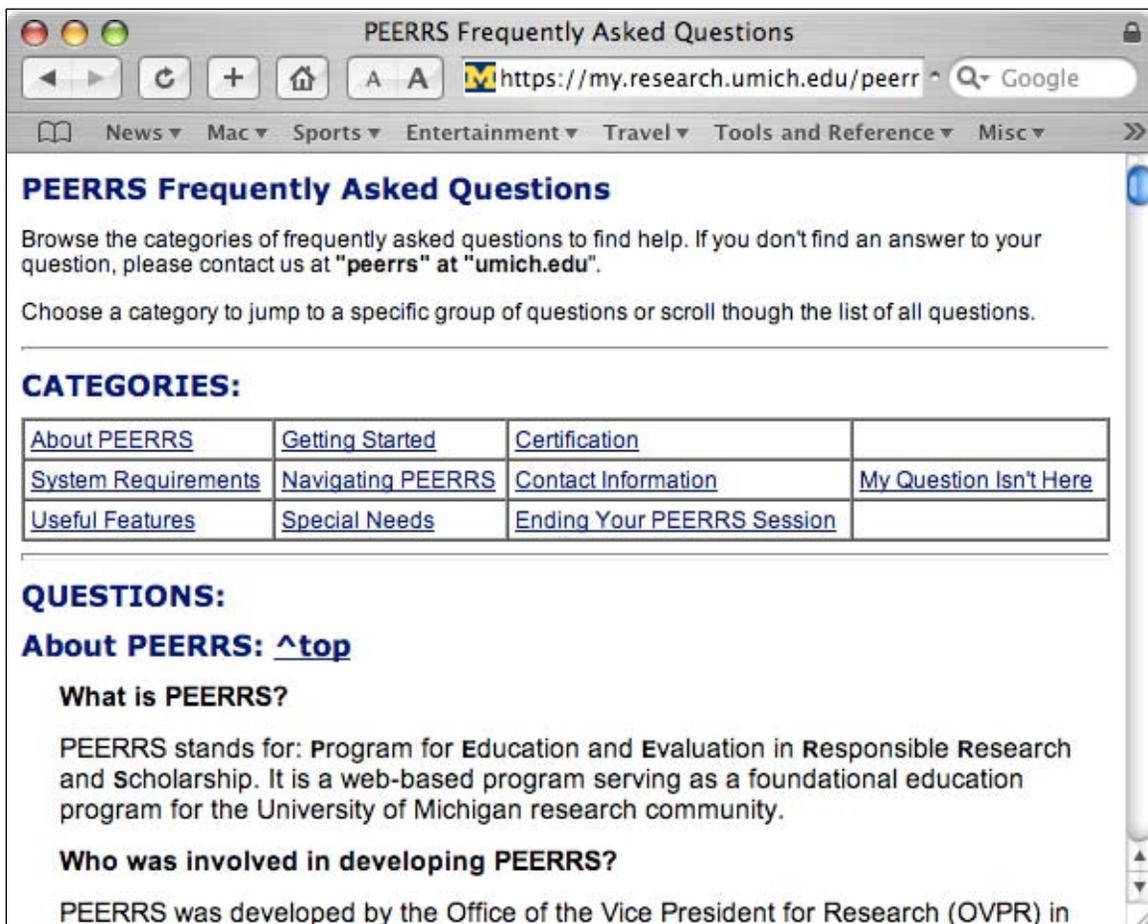
Task 4: Navigate Through a Certification Test

Links to the certification test, or quiz, are located on the both the last page of each module and on the customized page that lists the modules each user must complete. To perform the task the subjects had to locate one of these links, read the instructions for the quiz, answer 5 questions (which answers they chose were not important) on separate pages, and submit the quiz at the end.

Task #	Task	Severity
4	Navigate through a certification test	2

The subjects were asked to stop navigating through the module and begin taking the certification quiz. The greatest challenge subjects had in taking the quiz was finding it. Three subjects looked for a direct link to the quiz in the left-hand navigation menu. Two were not able to find it and had to be shown. Two subjects found the quiz by navigating to the last page of the module and clicking the "certification test" link. One subject found the quiz by returning to the custom module list page and clicking "take test." The subjects' success in the task and feelings about the completing of the task can be found in Table 10.

Table 10: Success in Navigating Through the Certification Test

Subject	Success in Navigating and Submitting Quiz?	Degree to Which they Felt the Testing Task was Easy to Accomplish	Numeric Response
S1	Succeeded	Strongly Agree	1
S2	Succeeded	Agree	2
S3	Succeeded	Strongly Agree	1
S4	Succeeded	Strongly Agree	1
S5	Succeeded	Agree	2
		Average	1.4

Recommendations
The first instinct of the test subjects was to look for a direct link to the test in the left-hand navigation at the bottom of the links for the module topics. To aid users, a link to the test should be put in this location.
Difficulty: 1/5

Task 5: Locate Previously Viewed Information in a Module

This task was given to the subjects after they submitted the test but while they were still in the testing section of the site. They were told to go back to the module they had been viewing and locate a certain topic within that module.

Task #	Task	Severity
5	Locate previously viewed information in a module	1

Three of the subjects were able to complete this task quickly by clicking the "Exit Test" link at the bottom of the test results page. They were returned to the module and selected the link from the left-hand navigation menu that matched the topic they were asked to find in the task. Two of the three successful subjects were viewing screens with greater than 1024x768 resolution. The two subjects who did not find the "Exit Test" link were using monitors with 1024x768 resolution and did not see the link because it showed up "below the fold." (See Figure 9) One of these subjects used the page history to go back to a page he had previously been on within the module. The other had to be shown how to return to the module.
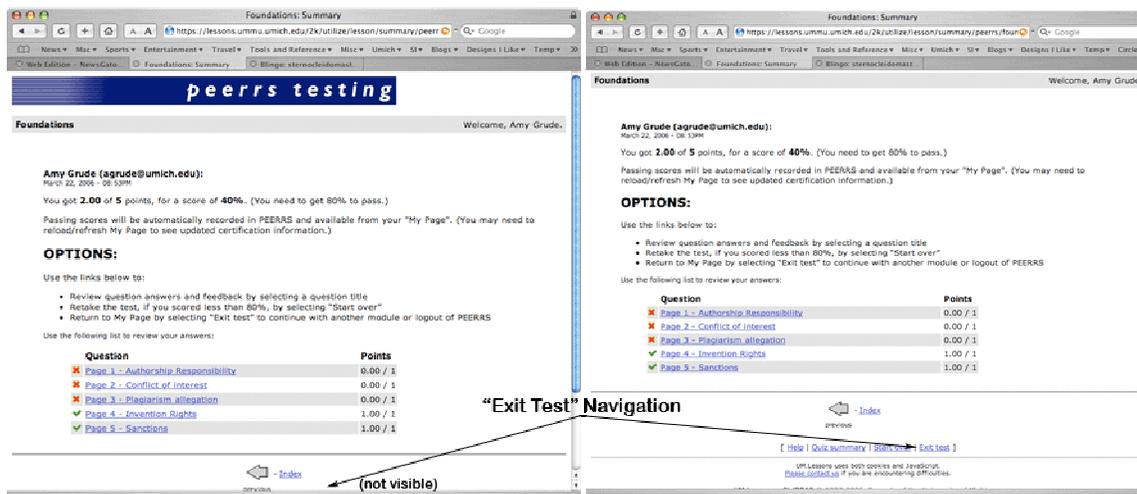
Figure 9: Exiting the PEERRS Test

Recommendations
The navigational elements that allow the user to move around through and exit the test should be relocated to a more prominent place on the page. Users with a 1024x768 resolution monitor should be able to see these links without having to scroll, because tests show that they do not scrolling is needed to see additional information.
Difficulty: 4/5 (since Lessons is not under PEERRS administrator control)

CONCLUSIONS

The five tasks tested in this study revealed eleven issues that need to be addressed. These issues were used to evaluate the severity of the task. Severity was determined on a scale of 1 being the least severe and 5 being the most severe.

- **Task 3:** Find Help was ranked with a severity of **5**
- **Task 1:** Register for PEERRS was ranked with a severity of **4**
- **Task 2:** Navigate through a module was ranked with a severity of **3**
- **Task 4:** Navigate through a certification test was ranked with a severity of **2**
- **Task 5:** Locate previously viewed information in a module was ranked with a severity of **1**.

It is the research team's recommendation that Task 3 and Task 1 must be fixed immediately, while tasks 2, 4, and 5 are not as urgent. Although these findings are preliminary, they are significant enough to warrant further testing of this system.

The results presented in this report are not completely representative of a standard PEERRS user session because the test subjects were not actually reading the modules for content or considering each question in the certification test before selecting an answer. The test subjects were also not chosen from a random sample of potential PEERRS users. Previous survey results from a random sample of PEERRS users indicate that the average age of a PEERRS user is higher than the average age of the participants in this study. Further testing should be done with older individuals at the University for a more comprehensive understanding.

REFERENCES

Peterson, C.J. (2000). "Seven Steps to Easier Web Navigation." Retrieved from the Usable Web on March 18, 2006 from http://www.smartisans.com/articles/web_navigation.aspx

Rubin, J. (1994). *Handbook of Usability Testing*. John Wiley & Sons, Inc. New York.

Usability First. (2005). "Website Design" Retrieved from Usabilityfirst.com March 18, 2006 from http://www.usabilityfirst.com/websites/design.txl

A p p e n d i x A

Pre-Test Questionnaire

Pre-Test Questionnaire

Name: _____

1. Sex/Gender
   - ☐ Male
   - ☐ Female

2. Age : ____

3. Familiarity with the Internet
   - ☐ Very familiar
   - ☐ Somewhat familiar
   - ☐ Average
   - ☐ Somewhat unfamiliar
   - ☐ Very unfamiliar

4. Please indicate the primary types of websites you use on the Internet:

   _____

5. Based on how you currently use the Internet, how does it affect your productivity?
   - ☐ Greatly improves
   - ☐ Somewhat improves
   - ☐ No affect
   - ☐ Somewhat decreases
   - ☐ Greatly decreases

6. Please indicate, from the scale of 1 (not usable) to 5 (very usable), how your experience been with the Internet.

   _____

7. Please choose from the following choices all the tasks that you have performed on the Internet:
   - ☐ Communication
   - ☐ Current event updates: News, Entertainment
   - ☐ Play games
   - ☐ Research
   - ☐ Shopping/purchasing
   - ☐ Online testing
   - ☐ Online banking
   - ☐ Listen to music

8. Have you ever used the Help tool provided by a website?
   - ☐ Yes.
   - ☐ No.

9. If you have used the Help tool, please indicate if the tool was helpful/unhelpful in addressing your questions
   - ☐ Very helpful
   - ☐ Somewhat helpful
   - ☐ Neutral
   - ☐ Somewhat unhelpful
   - ☐ Very helpful

Appendix B

Script

Script: Usability Test PEERRS

Preparation checklist
Equipment team: two Mac laptops, camera, microphone and website setup.

Greeting the participant
Meet the participant outside of pre-determined room. (Rooms are 402 West Hall, 405 West Hall, and a office at the Ross School of Business.

Good afternoon. My name is _____ and I will be working with you today. Before we sit down, do you need to use the bathroom or get a drink of water?

When the participant is ready, walk him/her into the lab and sit him/her down in front of the computer being used for the study. The moderator should sit next to and slightly behind the participant.

Pre-test procedures

The following introduction will be read to all participants before starting the test session.

Thank you for participating in this study. Today, we will be looking at the site for Program for Education and Evaluation in Responsible Research and Scholarship, or PEERRS. We are interested in observing how you use the site to complete some activities, how easy the site is to use and navigate, and what aspects of the application you like and dislike. Your feedback is greatly appreciated, because it helps us understand how to improve the site in the future.

I do want you to remember a few things as we begin the study:

- I want to emphasize that we are not testing you or your abilities – we are testing the Web site. We are here to learn from your experience.
- We are videotaping this session for the purposes of analysis because it is often difficult to remember everything that occurs in the session after the fact.
- We are interested in your feedback about all parts of the application, whether positive or negative. Also, there are no right or wrong answers. I did not design the application, so you do not have to worry about hurting my feelings.
- I want you to feel free to comment about anything, such as the content, the navigation or buttons, the terminology or name of things on the screen, the graphics, the colors, and the layout.
- I would really like you to constantly think aloud. I want to know anything you can say about your reaction to the application that I can't tell from watching you. For instance, tell me what you are looking at, what you are thinking, why you are doing something, and what is confusing you as you work through an activity. This gives me an understanding of your thought process and gives us insights on how to improve the Web site.
- Similarly, I may ask you some questions as you work. You may ask for help clarifying what I want you to do, but I may not be able to answer questions about how to complete an activity because I want to replicate, as closely as possible, how you would use the site if I were not here.
- Finally, you should know that you can let me know if you begin to feel uncomfortable during this study and wish to stop. You may leave at any time.

Do you have any questions before we begin?

Introduction

During the next thirty minutes we are going to complete several activities. First, I will ask you to fill out a pre-test questionnaire, just to obtain some information about you

Give the participant a pre-test questionnaire. Once they have filled it out, collect it.

Thank you. Now I'm going to give you some tasks to try on the site. Before beginning each task, please read it aloud. Let me know if you do not understand what the task is asking you to do, but remember that you will need to figure out how to do it on your own.

Remember to talk out loud and describe to me what you are thinking and doing.

Remember that there are no right or wrong answers, and that this is not a test of your abilities. When you are finished with the tasks I will ask you some questions about your experiences.

Remember that there are no right or wrong answers, and that this is not a test of your abilities.

Ready to begin?

Hand them the first task.

Hand them the second task.

Hand them the third task.

Hand them the fourth task.

Hand them the fifth task.

Debriefing and Final Questionnaire

Debrief and questionnaire materials will be presented at this point.

Ask the debriefing questions from the sheet. Then ask them to please fill out this questionnaire and leave it here when they have finished it. Then, you are done with the study. Thank them for participating! Here is your gift.

Hand gift to participant and leave them in privacy to complete the questionnaire.

Appendix C

Tasks

TASK #1

Please register yourself on the PEERRS system and make selections that most closely reflect you.

Please talk out loud while you are registering.

TASK #2

Please select the first module to review. In the module, please complete the module by reading out loud the first and last sentence of each page.

TASK #3

Assume you want to leave the module and are unsure if you can return to complete it at a later time. Where on this website would you find that information?

TASK #4

Take the quiz for this module. Answer each question and completing the quiz.*

Please do not be concerned with selecting the "right" answers.

TASK #5

Return to the modules and find information on _____.

Appendix D

Post Questionnaire

POST QUESTIONNAIRE

Please answer the following questions based on your experience with today's task.

I felt the Registration task was easy to accomplish.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

I felt the Module task was easy to accomplish.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

The navigation in the PEERRS modules was easy to use.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

I felt the Testing task was easy to accomplish.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

The navigation in the PEERRS test was easy to use.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

I found the help function useful.

1----------------------2----------------------3----------------------4----------------------5
Strongly   Agree   Neutral   Disagree   Strongly
Agree   Disagree

POST QUESTIONNAIRE

Using the rating chart below, please circle the number that closely matches how you feel about PEERRS.

Simple.............3....2....1....0...-1...-2...-3... Complex

Authoritative..3....2....1....0...-1...-2...-3... Unreliable

Easy to use......3....2....1....0...-1...-2...-3... Difficult to Use

Friendly...........3....2....1....0...-1...-2...-3... Unfriendly

Professional.....3....2....1....0...-1...-2...-3... Unprofessional

Safe..................3....2....1....0...-1...-2...-3... Unsafe

High Quality...3....2...1….0...-1...-2...-3... Low Quality

Like..................3....2....1....0...-1...-2...-3... Dislike

Appendix E

Post-Test Debriefing Script

Post-test Debriefing

The purpose of the post-test debriefing is to assess participants' emotions and impressions about the product. In addition, debriefing will allow us to clarify any ambiguities that may have occurred during the test. Debriefing will expand on the post-test questionnaire and address the following questions:

1. How would you rate, overall, the ease or difficulty of the task and why?
2. If you tried to use the help system, was it easy or difficult to find the answer? Why?
3. What did you like the least about the product?
4. What did you like the most about the product?
5. If there is one thing that you would like the designers to change, what is it? Why?
6. Would you use this product again?
7. Would you use this functionality again?
8. Would you recommend this product to anyone else?

Since the debriefing session is a conversation after the participant fills out a post-questionnaire, the debriefer has an opportunity to elicit detailed explanations of post-questionnaire answers and to ask for suggestions on how to improve the functionality tested.