LIS 677 Human Dimension in Information Systems

Spring 2012: Meets Thursdays 1:00 - 3:40 p.m. in HL 2K and on UH Island in Second Life
Landmark (LM): http://maps.secondlife.com/secondlife/University%20of%20Hawaii/178/121/22
Instructor: Dr. Diane Nahl, Professor
Office: HL 3C; Voicemail: 956-5809; Email (quickest response): nahl@hawaii.edu
Web Site: http://www2.hawaii.edu/~nahl/courses677.html
Office Hours: Email for appt.

Expanded Seminar Description

The seminar focuses on the human element in information systems through examining human physical, cognitive, and affective abilities, behaviors, and practices in interactions with information systems, with an emphasis on the role of affect in information system use. Readings cover cognitive and affective theories, research on information system use, and qualitative and quantitative HCI research methods in studies of technology use. This term the seminar explores and examines current research on information needs, seeking, and use, and human-system interaction in immersive virtual worlds, Web sites, and mobile interfaces.

Seminar participants work on a project at the Community Virtual Library (CVL) on Info Island in the immersive virtual world platform Second Life. Students collaborate while studying the immersive interface of Second Life both as users and field researchers. Students learn, practice, and research virtual IT literacy skills needed in immersive interfaces. The University of Hawaii Vice Chancellor’s office provides space on University of Hawaii System Islands (see above slurl). The Community Virtual Library provides the LIS Student Union near the Reference Desk on Info Island: http://maps.secondlife.com/secondlife/Info%20Island/150/96/23

Prerequisite: LIS 670 or consent.

Program Level Student Learning Outcomes

This seminar addresses the following outcomes of the LIS Program, enabling students to:

1. Understand, apply, and articulate the history, philosophy, principles, and ethics of library and information science and the related professions;
2. Develop, administrate, assess, and advocate for information services by exercising principled communication, teamwork, and leadership skills;
3. Organize, create, archive, preserve, retrieve, manage, evaluate, and disseminate resources in a variety of formats;
4. Evaluate and use the latest technologies, research findings, and methods;
5. Engage in projects and assignments dealing with multicultural communities, and representing diverse points of view.
Course Level Student Learning Outcomes

Students will:

1. Create and apply evaluative criteria and utilize human-computer interaction (HCI) research methods to examine information system interfaces.
2. Critically review and discuss interdisciplinary literature on particular aspects of human-system interaction.
3. Apply HCI research methods to design, conduct, analyze and report on systematic self-observations of interface use.
4. Apply HCI research methods to design, conduct, analyze, and report on pilot field studies with information system/setting users.
5. Critically review and discuss selected research and theory from cognate fields (cognitive science, psychology, computer science, information science, communications, education, anthropology, information technology management, human-computer interaction, and others).
6. Apply philosophical and ethical principles in designing and evaluating human-system interaction and complete a human participant certification module.

Course/Teaching Philosophy

The broad goal of the course is to help students acquire the ability to analyze, design and evaluate information systems and settings from the users’ perspective by applying methods and approaches from HCI. Since all are information system users the seminar participants constitute a learning community. The seminar takes a person-centered and hands-on approach to better understanding the human-system interaction experience, and to reducing and managing affective load. The assignments integrate the assessment of the user experience and interaction design by involving students in applying ethnographic methods to examine holistically the “self as technology user” as well as “individuals as technology users,” and by involving students in creating and assessing interactive experiences in virtual environments.

In today’s information environments human information needs, seeking, reception, and use are symbiotic with information technology. Affordances provided by ICTs (information and communication technologies) or com-tech enable engaging attention and expressing human will. The Field Research Report assignment helps students to focus on the affective, cognitive, and sensorimotor demands on people in socio-technical information-intensive environments. Research Design Workshops facilitate creating a pilot study, giving students experience in designing situated human studies, and providing feedback on common assumptions about information behavior.

The online discussions of the research literature touch significant issues in experience design, enabling students to gain a deeper understanding of a variety of approaches to studying ICT use. The Interface Assessment Journal assignment helps students focus longitudinally on their own concurrent user experiences to better understand the demands of situated use over time. Analyzing and critiquing personal use of systems gives students concrete experience in defining and applying measurements to system affordances. Interface Assessment Workshops facilitate exploring HCI evaluation methods, behavioral filters, and affordances, and services embedded in information environments.
Professional Expectations

LIS graduate students are responsible for observing the highest standards of intellectual and personal integrity in every aspect of their careers at the University of Hawaii. The profession promotes ethical and behavioral standards in public service and dealings with colleagues. Be aware that these behaviors are easy to observe and evident to faculty who are asked to write references for scholarships, internships and job applications. LIS students are expected to adopt these values and enact them in their interactions with fellow students, faculty, staff and professionals. Please read the Professional Expectations Notice for LIS Graduate Students at UH: http://www.hawaii.edu/lis/students.php?page=profexp

In addition, LIS 677 students are required to become officially certified to conduct human studies, according to federal guidelines and the University of Hawaii Human Studies Committee procedures.

In consideration of all during class, please turn off or set vibrate on mobile devices.

Teaching Method

Seminars promote the exchange of ideas and to facilitate that experience, attendance and constructive participation are required. Primary emphasis is on immersive learning projects, deep reading, online group discussion, critical analysis, and presentation of experiences, readings and projects. Oral, written, and interface assignments are designed to promote these activities. Guest presentations, demonstrations, Research Design Workshops, Interface Assessment Workshops, and problem-solving and evaluation exercises enliven concepts and theories presented in readings and lectures. Consult written assignment instructions (pp. 8-13) and the Required Seminar Readings packet.

Integrated Research Methods

Among others, students will study and apply the following research methods in course exercises and assignments: Information Retrieval method to analyze search strategies and compare results (for search task studies); Participant-Observer method to study naturally occurring activities on socio-technical information grounds (naturalistic observation and documentation); Movement Methodologies to capture dynamic processes and concurrent system use (logging, screen flow, structured self-reports, polling, survey, interview, etc.); HCI Research Methods to study information system use (card sorting, usability testing, heuristic evaluation and cognitive walk through); Content Analysis of user-generated discourse to study information practices and usability.

Requirements

Readings

Assigned reading from the text and articles in information science, cognitive science, psychology, sociology, human factors, and computer science will be the focus of online. Students lead weekly online discussions based on readings discussions Required Seminar Readings.
Assignments and Grading

Field Research Report 35%
  Written (25%)
  Oral (10%)
Interface Assessment Journal 35%
  Written (25%)
  Oral (10%)
Online Discussions (lead 2) 20%
Collaboration & Participation 10%

Grading Scale: 100-98 A+, 97-94 A, 93-90 A-; 89-87 B+, 86-83 B, 82-80 B-;
  79-77 C+, 76-73 C, 72-70 C-; 69-67 D+, 66-63 D, 62-60 D-

Due Dates

One point (1) will be deducted each day for late papers and assignments. If you miss class, you are responsible for obtaining notes from classmates and handouts from the instructor.

Collaboration & Participation Requirements

Attendance is required and active participation is essential when discussing readings, analyzing systems, and working in groups. Collaborative class and online exercises and discussions are central to the seminar's purpose of examining the human dimension in information systems. All members are expected to actively participate in weekly class exercises and online research literature discussions of the readings. Google Groups archives posting history.

Class sessions will be divided between HL 2K and meeting via online systems, and you may login if you cannot attend class. Two or more complete absences require written reports on readings for missed sessions. Full points awarded only if all participation requirements are met.

To accomplish these requirements, students will
1) Actively collaborate with seminar members and participate in class exercises.
2) Post comments in the 677 Google Group about lectures and readings that address the material and promote thoughtful consideration of issues.
3) Prepare engaging discussion activities, questions, quotations, exercises, and present observations, understandings, comments, insights, and criticism.
4) Listen and learn from each other's contributions through constructive comments and reactions in discussions.
5) Create well thought-out responses and prepare written work for class exercises on time.

Technology Integration and Requirements

This course requires you to use a computer to produce all assignments. You may bring laptops, netbooks or tablets to class provided you (1) bring your own extension cord and (2) you do not use it for non-class activities in class.

PCs are available in the open LIS Alcove Lab in HL 3 and during posted hours in HL 2K (first obtain an ICS student account—application forms available in class and the LIS office HL 2). Your ICS lab account must be renewed annually. Always bring your ICS user login to class in case you need to use lab machines.

Students are required to subscribe to and use the UH domain LIS 677 Google Group to post a profile picture, obtain updated seminar information, respond to requests, participate in literature

Students will use Google Documents to work collaboratively and submit assignments electronically.

Students will obtain a free Jing account to make and annotate screen captures for assignments.

Students will obtain a free Dropbox account to move files between devices for assignments.

Students will obtain a free Second Life avatar by January 19 to study virtual world information affordances and services in class exercises and assignments. **Always bring your SL avatar login to class.** Students are required to use a headset or earpiece for voice. **Allow time to install frequent SL viewer updates.** Download alternate viewers for interface comparisons.

### REGISTERING for SECOND LIFE

1.) Review the System Requirements, **Recommended** works best: [http://secondlife.com/support/system-requirements/](http://secondlife.com/support/system-requirements/)

2.) To register for a free account and download the Second Life Viewer software: Click the big orange **Join Now** button. [http://secondlife.com/?lang=en-US](http://secondlife.com/?lang=en-US)

3.) Think carefully about choosing your avatar name, it cannot be changed, although you can have multiple avatars and can change your avatar's Display Name. Shorter names are easier to manage. Please choose a **pronounceable** name that others can easily say and type.

4.) Registering for a free SL account requires name, birthdate and email. You get the account and avatar immediately. Record your login name and password and always bring it to class.

5.) After choosing an avatar: Click the **Download and Install** Second Life button.

6.) After registering, and downloading and installing the SL software you can login for the first time. Open the software. Type your **login name** and **password** and login. Your avatar will land at the main SL Orientation Area. Go through the 6 orientation areas and do the short orientation exercises.

7.) **Teleport to UH System Island:** under the **World Menu**, select **World Map**. In the search window type **University of Hawaii**. The UH Islands map appears with a red circle in the center. Click the **Teleport** button in the Map dialog window. Your avatar will land inside the UH Island Freebie Store.

8.) **NOTE**: If your system cannot meet the Recommended Requirements and has difficulty with the SL Viewer, you can try alternate viewers that use less system resources:


This Second Life Guide (2011) was created by Sharon LePage, Director, Sullivan Family Library, Chaminade University: [http://chaminade.libguides.com/secondlife](http://chaminade.libguides.com/secondlife)
# LIS 677 Seminar Schedule
(Subject to change)

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<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topics</th>
<th>Assignments &amp; Due Dates</th>
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<tbody>
<tr>
<td>1</td>
<td>JAN 12</td>
<td>Seminar Introduction Interface Assessment Journal Standards in Research Ethics</td>
<td>Chapter 1</td>
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<tr>
<td>2</td>
<td>JAN 19</td>
<td>Second Life Orientation Avatar Information Science</td>
<td>Research Ethics, and Human Subjects sites Certification Tutorial, SL Community Standards and Terms of Service Exercise: Usability testing of SL Orientation Guide</td>
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<tr>
<td>3</td>
<td>JAN 26</td>
<td>Human Computer Interaction (HCI) Research Methods UX Design: Mixed Reality</td>
<td>Chapter 2; <em>Why We Do Usability Testing</em>; Nardi Interface Assessment Workshop Exercise: Make a VW poster</td>
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<tr>
<td>4</td>
<td>FEB 2</td>
<td>User Studies: Usability Testing Field Research project</td>
<td>Chapter 4; <em>ECAR</em>; Hepburn &amp; Lewis; Kupersmith; Norlin; <em>How We Do Usability Testing</em> Interface Assessment Workshop Exercise:</td>
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<tr>
<td>5</td>
<td>FEB 9</td>
<td>User Studies: Information Seeking in Virtual Worlds Field Research project VW Field Trip:</td>
<td>Chapter 5; Mon; Nahl 2010 Research Design Workshop Interface Assessment Workshop Exercise:</td>
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<tr>
<td>6</td>
<td>FEB 16</td>
<td>UX Design: Affective Aspects Web Design <strong>Guest Speaker:</strong> Laura Solomon (Lebachai Vesta in SL) “Best Practices in Library Web Site Design”</td>
<td>Chapter 6; Rogers <em>et al.</em> Ch. 5; Krug Research Design Workshop Interface Assessment Workshop Exercise:</td>
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<tr>
<td>7</td>
<td>FEB 23</td>
<td>Affective Load in Information Behavior</td>
<td>Chapter 7; Mentis; Nahl 2005 Research Design Workshop Interface Assessment Workshop Exercise:</td>
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<tr>
<td>8</td>
<td>MAR 1</td>
<td>UX Design: Social Interfaces</td>
<td>Chapter 8; Rogers <em>et al.</em> Ch. 4 Research Design Workshop Interface Assessment Workshop Exercise:</td>
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<td>9</td>
<td>3/11</td>
<td>day light saving changes:</td>
<td>3LT = HST + 3 hours</td>
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<td>Interaction Design Theory and IB Models</td>
<td>Chapter 3; Kaptelinin &amp; Nardi</td>
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<td>Research Design Workshop</td>
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<td>Interface Assessment Workshop</td>
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<td>Exercise:</td>
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<td>10</td>
<td>MAR 8</td>
<td>Immersive Education in Virtual Worlds</td>
<td>Chapter 9; deFreitas</td>
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<td>Research Design Workshop</td>
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<td>Exercise:</td>
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<td>MAR 22</td>
<td>Spring Break</td>
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<td>11</td>
<td>MAR 15</td>
<td>UX Design: Future Trends</td>
<td>Chapter 10; Gosselin; Roettgers</td>
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<td>Exercise:</td>
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<td>Interface Assessment Workshop</td>
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<td>12</td>
<td>APR 5</td>
<td>User Studies: Centrality of Affect in Decision Making</td>
<td>Isen; Jokaydia</td>
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<td>Exercise:</td>
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<td><strong>DUE:</strong> Interface Assessment Journal</td>
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<td>13</td>
<td>APR 12</td>
<td>Use-Design Improvements</td>
<td>Hunt; Nielsen; Manjoo</td>
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<td>Exercise:</td>
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<td>Research Design Workshop</td>
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<td>14</td>
<td>APR 19</td>
<td>User-Centered Revolution</td>
<td>Hoekman; Nahl 2010; Victor</td>
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<td>Exercise:</td>
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<td>Field Research Presentations</td>
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<tr>
<td>15</td>
<td>APR 26</td>
<td>SL Mini-Convention on Field Research Findings Last Day</td>
<td>Field Research Presentations</td>
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<td><strong>DUE:</strong> Field Research Report, Course Evaluation</td>
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<tr>
<td>16</td>
<td>May 3</td>
<td>Finals Week</td>
<td><strong>DUE:</strong> Last day to turn in assignments</td>
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Interface Assessment Journal

This assignment is designed to enable an experiential user-perspective on interface use, and provide practice in behavioral research methods and data analysis. Assignment activities are designed to involve students in learning new interfaces through a series of collaborative tasks and by studying their own experience with learning curves.

PROJECT REQUIREMENTS

1. Students work in pairs on interface tasks in class lab exercises and outside class, and record systematic self-observations during collaborative interface use.
2. Students examine web sites and apps, attend a variety of Second Life events, create an interactive exhibit, and explore other virtual worlds.
3. Students use behavioral filters introduced in class lab sessions to record affective, cognitive and sensorimotor processes while adjusting to and using interfaces.
4. Students use structured self-report forms to record IAJ observations.
5. Students create and analyze one dozen (12 minimum) IAJ structured self-reports for the report due April 5.

Required CVL/UHS Interactive Exhibit for IAJ Structured Self-Reports

Exhibits will be placed on Info Island and UH System Islands in Second Life (2 copies): Students work in pairs to create a VW interactive exhibit on any subject. The exhibit project involves researching a topic in SL and on the Web, making and acquiring necessary virtual objects, publicizing and inviting participants via SL groups, producing the exhibit, and assessing impact on participants. This production activity establishes a VW information ground to study as a participant observer in vivo. This project allows you to study the SL virtual world interface while you learn to use it for a professional collaborative purpose.

Suggestions for Second Life Immersive Events for IAJ Entries

The Community Virtual Library (CVL) will be creating several exhibits and activities on the Info Islands for IAJ entries. The Info Island Reference Desk maintains a weekly calendar of events.

UH Islands advertise monthly events and activities to participate in and to attend.

Immersive Tours
Testis Tour Tour (Ohio State U) http://maps.secondlife.com/secondlife/OSU%20Medicine/205/140/26
Virtual Hallucinations (UC Davis) http://maps.secondlife.com/secondlife/Sedig/25/46/22
Take a tour and create IAJ entries while using the affordances.

SL Events and Activities
The Destination Showcase highlights impressive sims. Attend events and explore activities and resources in a variety of areas and create IAJ entries.

Other Virtual Worlds
Kitely Virtual Worlds on Demand (Web-based via Facebook) http://www.kitely.com/#!/myworlds

Web Sites
Almost any Web site can be used to do tasks to generate data for an IAJ structured self-report.

Mobile Devices
Kindles, Nooks, and other e-readers, interfaces and apps on smart phones, iPads and other tablets, can be used to generate IAJ structured self-reports.
Interface Assessment Journal

The purpose of this assignment is to enable students to gain skill in assessing the effectiveness of information system design and use through longitudinal systematic self-observation:

- Designing outcomes assessment criteria to examine interface effectiveness.
- Longitudinally studying the self as user on socio-technical information grounds.
- Using HCI research methods, and statistics to analyze one's own user behavior.
- Valuing self-observation as a useful tool for analyzing information behavior and improving system and service design.

Systematically analyze your experience with the Second Life and other interfaces according to standard and additional criteria. Use structured self-reports to keep a systematic Journal of your reactions as a user of the interfaces, participate in exercises using the interfaces, and write a report of your experiences according to criteria below, criteria given in class, and your own criteria.

The content of the IAJ reflects your work in Second Life with CVL and UH Islands projects and activities, other sims, mobile devices and Web sites. The IAJ represents your personal experiences working in virtual worlds and other interfaces, and the report represents a content analysis of your own concurrent user-generated discourse about immersive interfaces.

Requirements

1. Create a Second Life account, avatar, download the software, login, and begin the first orientation exercise (follow specific instructions given in lab).

1b. Create accounts in two other virtual worlds.

2. Explore the SL and other interfaces in both formal (class exercises and Exhibit team project) and informal (self-directed) situations. Use the Interface Assessment Journal Structured Self-Reports to document your personal reactions (affective, cognitive, sensorimotor) while concurrently using the interface. Make a minimum of 12 IAJ data entries throughout the term both in and outside of lab. The IAJ will be turned in as an appendix to the report.

3. Create an interactive exhibit with partner for Info Island and UHS islands and make IAJ structured self-reports during work on the project.

4. Appropriate behavioral filters for IAJ data gathering are provided in lab. In addition, review and select interface evaluation criteria taken from standard texts, Web sites, published standards, research or trade literature.

5. Test interfaces against your evaluation criteria by identifying and performing tasks that are routine for that interface. Critique external and internal instructions on using the interface, particularly where you experience a lack of clarity and feel uncertainty, record how you coped with and resolved the confusion, etc.

6. Both statistical analysis and content analysis will be used to analyze portions of your IAJ data. After reviewing the data for recurring patterns or themes, or patterns of development like a learning curve or shift in coping methods, make selections to illustrate the findings. Statistical analyses will be kept simple (ratings and frequencies). Content analysis is used
for user-generated discourse and other textual data. Analysis methods are taught in Research Design workshops during class.

7. Submit a written analysis of your findings via attachment, including a well-organized, point-by-point assessment. Cite theory and method to support your findings. Submit Interface Assessment Journal Entries separately as an appendix. Written report due April 5.

Grading Criteria: Clarity of user focus in evaluation criteria; clear distinctions made between criteria; evidence of critical assessment; sufficient IAJ data; useful content analysis of concurrent user-generated discourse; accurate presentation of numerical data in graph and/or chart form; cogent demonstration; readability.
Field Research Report

The purpose of this assignment is to enable students to gain skill in assessing the effectiveness of information system design and use through:

- Designing pilot research projects to study system users on socio-technical information grounds.
- Using HCI research concepts, methods, and statistics to analyze user behavior and make useful recommendations for redesign and improvement of outcomes.
- Valuing field research as a useful tool for analyzing information behavior and improving system design.
- Valuing and applying ethical standards in research with human participants.

Librarians are frequently called upon to design systems and services and produce data for decision-making about services to users. Strategic planning models in most institutions and accrediting bodies require librarians to focus on assessing or measuring outcomes to show the degree to which systems and services are effective, meet strategic goals of the institution, and how service could be improved.

Pilot study projects will be conducted in teams in a Research Design Workshop environment with time set aside in class to work on the design and the analyses. Statistical analyses will be kept simple, but teams will work with spreadsheets for the raw data analysis of scores and other numerical data. Content analysis is used for user-generated discourse and other textual data.

Teams may schedule and use the LIS usability lab located in HL 2M.

**VW pilot field study:** Select an environment in Second Life where avatars are using information objects and tools. Design a small pilot study of some of the avatar users in that environment. Upper-division undergraduates in three SL psychology classes will be available as participants in your pilot study. Their SL courses use an immersive environment above UH Island where you may conduct your study, or you may use other SL venues for the study. Create a Consent Form using models provided and have your participants sign it, and include the signed forms as an appendix to the report.

**Other systems pilot field study:** Select an environment where people are using information objects and tools. Design a small, pilot study of some of the users in that environment. You may choose the system and users and acquire consent after completing human participants protection certification. Create a Consent Form using models provided and have your participants sign it, and include the signed forms as an appendix to the report.

Review the literature on relevant aspects of the avatar-user, VW system, users of another system and other parameters pertinent to your study. Gather and analyze data, and present the findings in a standard written research report and orally in Second Life. Relate your findings to prior research and theory in the literature review.

Although this is a team project, reports will be written individually using the format for published research articles. Members may share the same Title, Abstract, References and Methodology sections. Each person will write individual Introduction, Results, and Conclusion sections. You may choose to focus on particular aspects of the data in your individual write-up, in which case your Title and Abstract may differ.

Research with human participants requires adherence to federal guidelines. You are required to become certified before beginning this project. The tutorial and certification are free (link in Readings). Email your Certification form to me. (IRB approval is needed for publication of data.)
Report Requirements

A. Describe the pilot study in the Introduction, including relevant features:

1. The information system environment and its components.
2. The role and typical activities of users in that environment.
3. What you want to look at and why.
4. Cite some research literature and discuss its relevance to your study. Include information found in the required readings as well as other user studies. Include tie-ins to aspects of information behavior, user-centered interaction and experience design (UX), emotional design, affective load, and affective acceptability.

B. Describe the research design and methodology, including:

1. The information system, the test setting, and participants (number [n=], gender, age, academic status, computer experience).
2. Your research design (how you structured the testing or observations).
3. Your hypotheses (your expectations of what you'll find before you gather or analyze any data) and research questions (RQs) (what you want to know, what you hope to answer via the study).
4. The type of data gathered and the instrument(s) used to gather the data (describe what participants did or filled-out). Systematic observations, pre-post results, performance exercise results, interview, questionnaire, card sort, structured self-report, log files, ratings, etc.).
5. The exact procedures you followed while gathering and analyzing the data (so that it could be replicated by another).
6. Identify any potential confounding variables or limitations that might interfere with making a correct interpretation of the data or in generalizing it.

C. Discuss the findings, the results of your analysis, including:

1. What the data reveal about the information system dynamic (use tables, charts, and/or graphs to represent data). Label each table, chart and graph with a number and descriptive title. Place them within the text, mention them by number and discuss each (they do not stand alone, a picture is not worth a thousand words). Make sentences from data in tables and graphs to explain your results, e.g., explain what contributed to the size of a pre-post test difference.
2. Discuss implications for users, interaction and experience design, instruction and training, and outcomes assessment. Tie-in to research literature to relate your findings to other studies, to relevant aspects of information behavior, HCI principles, and theory in required readings.
3. Conclude with your own recommendations for further research, information services, and design practice for similar environments.
4. Make final remarks to future students about the research process and what you learned from this assignment.
D. Formats

1. Reports should be accessible on the Web, 8-10 pages (including graphics, instruments and references), 1.5 spaced. Use a standard citation style for the field (prefer APA). A one-page PowerPoint slide consisting of the Title, Name, Date, Course, Abstract and a graphic of major results in SL poster format with group permissions for the oral presentation.

2. Writing order varies among people, the order below works for science writing. Organize the paper under the following sub-titles:

<table>
<thead>
<tr>
<th>WRITING ORDER</th>
<th>ORDER for REPORT SUB-TITLES</th>
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<tbody>
<tr>
<td>First, revise last</td>
<td>Title (Fully describes the project)</td>
</tr>
<tr>
<td>Last</td>
<td>Abstract (Briefly summarizes problem, method and results)</td>
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<tr>
<td>Fifth</td>
<td>Introduction (States the research problem and reviews relevant literature.)</td>
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<tr>
<td>Second</td>
<td>Methodology (Describes the research design and all procedures followed.)</td>
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<tr>
<td>Third</td>
<td>Results and Discussion (Presents analyses, charts, graphs, tables and interpretations of data.)</td>
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<tr>
<td>Fourth</td>
<td>Conclusion (Summarizes the important findings and makes recommendations for future research and for practice. In a separate paragraph, make comments to future students on what you value about doing this research project.)</td>
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<td>From the beginning &amp; throughout</td>
<td>References (Use standard style)</td>
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<tr>
<td>Prior to writing</td>
<td>Appendices (Data gathering instruments, notecards, content analysis clusters and coding, etc.)</td>
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3. Make a 20 minute oral group presentation of the study to the class using SL affordances (scheduled in SL during class on April 19 or 26). The written report is due April 26.

Grading Criteria: Following instructions; technical accuracy (pagination, grammar, spell checking, typos, section headings, consistency in citation/reference style); accurate, clear and well-labeled tables and graphs; coherent synthesis of data and rationale for methodology used; relevant integration of research literature; evidence of critical thinking; application of HCI concepts, theories, methods and models; use of SL affordances in presentation.