Wiring a Usable Center
Usability Research and
Writing Center Practice[1]

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*I*T'S NO SECRET THAT THE STUDY, IMPLEMENTATION, AND USE OF NETWORKED computers in writing instruction requires critical reflection. (Many writers, such as Cynthia Selfe, 1992, Christina Haas, 1996, and Ann Hill Duin and Craig Hansen, 1996 have made that claim.) We're still learning, though, how to reflect critically—how to examine the interactions of technology and humans in the writing process. We're still learning because the task is complex: To employ networked computers effectively in writing centers, one must be able to examine (at the very least) the writing process, human interaction, and sophisticated technologies. Each phenomenon, elusive and complicated enough by itself, becomes all the more difficult to examine in combination with the others. Nevertheless, we must attempt this complex task because "[t]o be literate in an age of electronic tools," as Jane Zeni (1994) writes,

> learners must act and then reflect: how the writing went; where they got stuck; when their tools helped or impeded the flow; what revisions the text needs; which tools will support the next phase of the process. (79)

If we are to help students develop electronic literacies, and to develop our own, we need to practice the kind of reflection that Zeni advocates. We need to develop research methods well suited to examining the interactions of networked computers and writing instruction.

To illustrate the challenge of researching and implementing networked computers in a writing center, consider the following scenario: A director has received funding to implement several networked computers in a writing center that offers f2f tutorials to the entire campus, and she wants to explore how email, the World Wide Web, and various synchronous environments (MUDs/MOOs and other types of conferencing protocols) might aid instruction. She reads the pioneering accounts of networked computer use in writing centers (e.g., Coogan, 1994 & 1995, Jordan-Henley and Maid, "Tutoring" "MOOving", Kinkead 1988) but discovers that these accounts often contradict one another. Such contradictions shouldn't be unexpected, she soon realizes, because the success of networked computers at any particular site depends on a wide variety of local issues, including existing

technical support, administrative policies and procedures, tutorial practices, and prevailing theories of technology.[2] A MOO, for example, may benefit a long-term tutorial relationship where tutor and client have time to become proficient with the program, but such a technology may fit poorly at walk-in centers where most clients meet with a tutor once or twice during a semester. Students in the latter setting would lack the time to learn the technology.

Though accounts of networked computer use have a significant value, the writing center director in this scenario realizes that they aren't enough to predict what might ultimately prove useful in her center. So, perhaps she creates a questionnaire to determine students' and tutors' needs regarding writing instruction and networked computers. She soon discovers, however, that it's almost impossible to have anyone discuss something meaningfully without actually having seen or used it. How can someone guess at the potential of email, or a video conferencing protocol, without actually seeing how the technology works? A question such as "Would you be likely to use email to send papers" may get many affirmative responses on a questionnaire—as was the case for Muriel Harris when she first assessed student needs and attitudes at Purdue.[3] But will tutors and students actually use email for tutorials once they've tried it? Or will they even take the time to try it in the first place?

How, then, does one determine what's valuable in one's own center? One could purchase technology and experiment with it; however, most of us lack the time and resources to experiment randomly with networked computers (although some amount of trial and error is inevitable and beneficial). It also would be unethical to "experiment" with students who come to a writing center with pressing concerns. Like us, they often lack the time to take a chance on a networked technology. Nevertheless, we need to investigate our technology needs and to persuade others of the reasonableness of those needs. We need to be prepared to act when funding becomes available (in part because funding often comes with spending deadlines that prohibit critical reflection). What we need, therefore, are methods to determine when, where, and how networked computers may benefit writing center tutors and students, methods that help us consider not only what such technologies *can* do but what they *should* do (Zeni, 76).

Methods already exist for studying the interactions of technology and humans—methods that can be adapted to writing center practice. What I refer to here are usability research methods that have been developed in repeated attempts to design technologies that support humans' efforts to learn, work, and communicate. In this chapter, I introduce readers to (or perhaps remind them of) several of those methods, and, more specifically, I

- define usability research[4] and argue for its promise and ethical appeal for writing center practitioners,
- describe several of the most promising types of usability methods and relate some of my own attempts at them, and
- identify several resources for those who wish to pursue the subject further.

Though this essay cannot offer an in-depth treatment of usability research, it offers an introduction intended to convince readers to begin planning their own research projects, projects that can generate qualitative data suited both to informed change and to publication.

THE GOALS OF USABILITY RESEARCH

If we as writing center practitioners are to make informed decisions regarding the implementation of networked computers, then we need ways to gather meaningful data that will yield insights[5] into how people interact with sophisticated technologies. Moreover, we need to develop productive research strategies that bring about change. We don't need methods for what Larry Hickman (1990) calls "armchair inquiry" (24). Nor do we particularly need a way to establish Truth—e.g., to prove or reject certain hypotheses with a statistically "rigorous" sense of certainty. Rather, we must learn to examine networked technologies as practitioners, as people who each have "an interest in transforming the situation from what it is to something [she or] he likes better" (Schön 1983, 147). To do this, each of us needs to reduce the confusion and ambiguity that networked technologies introduce to writing center practice, to reduce that ambiguity to a point where we can take purposeful action in implementing such technologies. Usability research is a promising methodological resource because it enables such action.

Usability research and testing can enable researchers to gain insight into human/computer interaction. The most promising methods for writing center work see humans not as parts of a system, but as partners engaged in a dialogue with technology. When users engage a technology, they look to it for clues as to its intended use. The way a technology is configured—e.g., the options available in its design—sends messages to users about what can and cannot be done with that technology. "Through their structure and appearance," Paul Adler and Terry Winograd (1992) write, "designed objects express more or less effectively what they, how they are to be used, and how they are integrated with the embedding context" (7). The icons available in an operating system, for example, set expectations for the type of work that can be done and even for who the appropriate type of users might be, as Cynthia Selfe and Richard Selfe (1994) have argued. (Think about a time when you first interacted with a technology, such as a new computer program, or a bread machine, or a VCR. Think about how you may have looked at buttons, labels, and other objects in order to determine the technology's uses.) A dialogic model places users in a position at least equal to technology because a "breakdown" cannot automatically be blamed on the user. A poorly designed technology, a technology designed with little consideration of users' needs and actions, may be at fault for sending poor messages.[6]

The basic goal of usability research is, consequently, what Lucille Suchman (1987) calls "studies of situated action," the purpose of such studies being "to explicate the relationship between structures of action and the resources and constraints

afforded by physical and social circumstances" (179). In studying the relationships between actions and resources, one can gain enough certainty to change and refine the technologies that make up a writing center's networked resources. What usability research can yield, therefore, are insights into how writers interact with networked computers in order to complete writing tasks, and such insights can best be achieved through studies of writers interacting with technology, which is why I advocate usability research methods that draw users in from the start. To understand situated practice, one must observe users at work in actual settings because, as Pelle Ehn (1992) has argued, knowledge and skill is best understood in situated practice, rather than through some formal model (121). Therefore, insights for design—insights that can guide a writing center practitioner's decisions regarding the implementation of networked computers—must come from careful observation of, and interaction with, actual users. The next section describes several methods for fostering such observation and interaction.

PROMISING USABILITY RESEARCH METHODS

Usability research includes numerous types of methods, several of which can prove useful for writing center practitioners. In this section, I describe several such methods and recount some of my initial experiences in implementing some of them. Though I describe ways to examine the interaction of humans and technology, I do not offer an in-depth "how to" discussion. My intent is to offer an introduction rather than a complete guide. (See Table 1 for a summary of the strengths and weaknesses of each method.) Those interested in detailed planning advice should look at the resources listed in the section entitled "For Further Reading."

Interviews and Questionnaires

Interviews and questionnaires are familiar methods that can be adapted to the needs of usability research, particularly for determining subjects' current uses of technology. Through interviews or questionnaires, we may be able to find out how many people have computers where they live, how often they use computers, and general attitudes toward such technologies. Such methods have a significant limitation, however: They cannot predict future uses. You could send out a one-time questionnaire to students and tutors, for example, in order to discover what they might need and want from email, but you're likely to discover that one-time responses aren't very useful. It's difficult for questionnaire respondents to envision possible uses of networked computer technologies, especially if they haven't seen the technology in question. Without any network experience, how is a respondent to answer in any meaningful way?

Focus Groups

In focus groups, a researcher/moderator brings together a representative group of people and tries to foster several hours' worth of discussion. (Jakob Nielsen 1993, 214) suggests gathering approximately six to nine participants for about

Table 1

Benefits and Challenges of Four Usability Research Methods

Method	Primary Advantages	Primary Challenges
Interviews & Questionnaires	Researchers can easily assess a large group of subjects' current uses of, and attitudes toward, networked computers	Difficult to predict future uses if subjects are unfamiliar with the technology in question
Focus Groups	Allowing subjects to engage in dialogue together makes it likely that researchers will uncover unexpected issues	Requires significant effort in terms of bringing group together and moderating discussion
Think-Aloud & Question-Asking Protocols	Observing subjects at work with a technology allows researchers to discover the kinds of decision-making processes that people use when encountering that technology and to identify potential "breakdowns"	Requires significant effort because one researcher can observe one participant at a time
Self-Reporting Logs	Asking subjects to record certain types of technology use over time allows trends to emerge and also encourages subjects to reflect	Requires researchers to ensure that subjects understand how to use the logs and that they complete them
	Logs can be generated collaboratively between researchers and subjects	Quality of the completed logs depends in great part on subject's input

two hours.) One benefit of a focus group is that participants could interact with a technology and then take time to discuss with others the implications of that technology. For example, a writing center director could invite a group of first-year students to the writing center, introduce them to a set of conferencing protocols such as those included in Netscape Communicator, give them time to try it out, and then encourage discussion about its possible uses, their reactions to it, etc. This not only lets participants interact with the technology, but it also allows for the kind of discussion that may yield unexpected insights, thus overcoming some of the major limitations of questionnaires and interviews.

Despite their promise, however, focus groups present challenges. One faces not only the daunting logistical task of gathering people together at the same place and time but also of moderating the group in a manner that fosters discussion. For example, I wanted to assess the expectations and preferences of first-year writing students using networked computers, and I knew I'd have difficulty bringing a group of students together for several meetings. I thought, therefore, that a listserv might allow a number of people to discuss issues of computers and writing while eliminating the need to negotiate meeting times and places. To test the possible dynamics of such a dialogue via listserv, I invited students from a computer-based developmental writing class to participate in a listserv discussion during the month of November, 1996. I assured the students that their instructor would not read what they had written, and I encouraged them to raise issues as well as respond to questions. I had hoped to create a dialogue not only in which I discovered useful responses to my own questions, but also in which students raised their own concerns. However, the students stuck to a question-and-answer format. I would pose a question, and then a number of the students would respond to it. The students never raised their own questions or responded to each other. One person even responded directly to my email account, rather than to the listserv, thus keeping his responses from his classmates. (I never knew whether he did this intentionally.)

A face-to-face (f2f) session may have been (and may be) preferable for promoting dialogue, especially among developmental writers. Perhaps the need to respond in writing was too daunting. (A listserv may prove possible when working with people who are comfortable interacting in writing, people such as tutors.) Or it could be that I have to learn to moderate an online discussion. It is also possible that I recruited too many people for the study. (I had more than nine people participating.) Most likely some combination of the three factors affected the study. Despite these problems, focus group remain a promising research method for me because they can yield insights into students' uses of technology and their expectations for writing instruction. My first experience at running a focus group simply illustrated to me the importance of establishing a comfortable forum for dialogue.

Think-Aloud and Question-Asking Protocols

In think-aloud protocols, a researcher observes a participant as she uses a particular technology. The participant is encouraged to "think aloud," to articulate what she is thinking about, as she works with that technology. For example, a researcher wanting to test a website's navigability might ask a potential user to browse through the site and would encourage the participant to talk about his reactions to particular pages, about his decisions to choose particular buttons, about confusions, hesitations, pleasant surprises, etc. As the participant worked through the site, the researcher would take notes, including quotations, a record of mouse clicks, time spent on pages, etc. A question-asking protocol is almost identical, except that researchers often "intrude" on the user's work by asking questions as they use the

technology. Or researchers may pose a set of questions at the beginning of the test for participants to address as the test proceeds. In my experience with think-aloud protocols, researchers have to prompt participants to give voice to their thoughts anyway, so the distinction between a think-aloud and question-asking protocol is blurry.

The benefit of such protocols is that they generate direct observation of a user working through a particular technology. This leads to several significant benefits:

- researchers get to see a user as she or he actually works with a technology, which means that researchers can discover the kinds of decision-making processes that people use when encountering that technology.
- Researchers can identify potential "breakdowns," points where the communication between a technology and a human fails.

The drawback of such protocols, however, is that they are labor intensive. A researcher can only observe and interact with one participant at a time.

I have used think-aloud and question-asking protocols in order to test how people respond to an online survey and to observe their navigational habits in the World Wide Web. By observing students as they tried to fill out an online survey, I could

- discover preferences for filling out text boxes or clicking on multiple-choice options,
- determine whether wording needed to be modified and when fewer or more instructions were needed, and
- determine how to where to place links between web pages

By accident, the tests also helped me decide to reject the use of video in a test using *Enhanced CU-SeeMe,* which I explain in the next section.[7]

Self-Reporting Logs

Using self-reporting logs, researchers can prompt participants to report and reflect on their uses of a particular technology over time. For example, a practitioner may ask a number of students and/or tutors to keep track for one week of such things as when they logged on to and off of a network, what they did while logged on, and their reflections on their experiences. This method has an advantage over others such as think-aloud and question-asking protocols because it could allow one practitioner to examine the work of a relatively large number of participants. (Because the logs are "self-reported," a practitioner need not be present when a participant logs on to a network.) However, the method's strength also can be its drawback. A practitioner must trust that a participant is reporting accurately. One also may miss such subtle things as a user's hesitancies at the keyboard, immediate reactions to certain things encountered on screen, etc.

Despite their potential drawbacks, self-reporting logs can be useful with tutors and other colleagues, especially if one is trying to prompt participants to reflect on their uses of technology. Because tutors have already been trained to reflect on writing and its instruction, they already possess a significant training

and vocabulary through which to examine networked computers and writing instruction. Tutors may generate a rich set of data as a consequence. By prompting participants to log their activities with—and responses to—technology, self-reporting logs may prove useful by revealing certain patterns of technology use that had not been recognized previously.

I used self-reporting logs during the spring semester of 1997 with two groups of tutors, each from campuses roughly 90 miles apart. We used the logs to help us identify the potential implications for tutoring of the video- and audio-conferencing package, *Enhanced CU-SeeMe* by WhitePine. (The intent was not so much to decide whether to implement *CU-SeeMe* as to discover the factors that may be important when using such a package for distance tutoring.) The tutors from both campuses took turns serving as tutor, student, and observer, and together we developed research logs for each type of role. (The logs appear in Appendix A.) Consequently, each distance tutorial generated four logs (two from observers at each end and one each from the tutor and student). The logs prompted participants to report the time spent on tutorials and time spent on "technical" and "logistical" tasks such as logging on and working around technical glitches; to describe the tutorial; and to reflect on ways in which the technology may or may not have helped.[8]

Self-reporting logs generated a rich body of data on which all the participants could reflect. Moreover, the use of the logs made all participants significant partners in the research project because complete sets of the logs were shared among everyone in the study. Because of this, and because the logs were generated through group discussion, this project illustrates a democratic form of research in which all participants take a significant role in generating and analyzing data. Moreover, the data comes directly from observations of people interacting with each other and with technology. This method seems well suited to adaptations in writing center settings.

Each of the four types of usability research that I describe in this chapter have potential strengths and challenges, which are summarized in Table 1. (I label the third column "primary challenges" because they're not necessarily weaknesses.) A research project may benefit, consequently, from using a combination of methods in order to take advantage of the unique strengths that each method offers. Nielsen's book offers helpful advice on choosing and combining usability methods (see chapter seven). Also, as with any research project, there are a range of planning issues that one should consider before developing a project using any of these methods—issues such as setting goals, budgeting a project, and recording information. For example, a researcher should walk into a think-aloud protocol or a focus group session with a clear idea of the types of issues that he wants subjects to address; otherwise the discussions may digress to a point where comparisons across sessions become difficult. A researcher also needs to think carefully about gathering data. One may want to use written notes, audio tape, or video tape. Decisions about data gathering should be based, of course, on the goals of the research.

WHY PRACTICE USABILITY RESEARCH?

We are constantly learning to use networked computers to support what Adler and Winograd (1992) call "higher-order cognitive activities" such as writing and social interaction. Usability research methods can play a critical role in this learning process because, as Adler and Winograd (1992) point out, "there is often no substitute for direct user participation in the design process" when "the effectiveness of a system depends on how well it supports higher-order cognitive activities" (5). Usability research offers several promising methods not only because they engage students at various points in a design and decision-making process, but also because they can empower participants; they are theoretically informed; and they can yield data that is not only locally useful but potentially publishable.

Usability research merits our attention in large part because many of those methods were developed to meet productive aims. Because usability research methods have been employed in design and production processes, they are methods for generating knowledge that leads to changes in design and implementation. As is mentioned earlier in this chapter, usability research rejects "armchair inquiry" by going beyond mere description and interpretation of data. Such research also merits greater attention because much of it (especially the research of the Participatory Design movement; e.g., see Susanne Bødker (1991) and Ehn) has an openly political goal that writing center practitioners can easily accept. The goal of many usability research projects has been to empower users, in each case to design a technology that "supports the potential for people who work with it to understand it, to learn, and to make changes" (Adler and Winograd, 7). This desire for research methods that lead to human empowerment, rather than their subordination to technology, makes many usability research methods compatible with writing center practice. After all, most of us would rather empower than subordinate tutors and students. If we are to use technologies (and we're always using them) then we should use them to further democratic purposes and to enable students to learn in satisfying ways.

The approach to usability research that I advocate here meshes with many writing centers' long-standing emphases on student empowerment and echoes arguments by such writers as Stephen North (1984) and Christina Murphy (1994) that writing centers are uniquely suited to join current writing pedagogies in a student-centered setting. While arguments may appear in writing center literature over the means of empowerment, the purpose of encouraging students to become more engaged in discourse about writing and the academy, to become agents of their education, remains widely shared. By developing research methods that engage students in ongoing dialogue, we are asking them to assume an active role in determining what they want to accomplish in their education, and how they want to proceed. Not only do usability research methods make users equal partners in a dialogic act rather than the subordinated component of a larger technology, the inclusion of end users into the design process can give them a significant voice,

thereby allowing their needs to be represented more fully. Students and tutors deserve this type of voice in our centers.

Usability research is theoretically informed and can therefore be "academically rigorous." Such research is heavily influenced by the work of Martin Heidegger, the later work of Ludwig Wittgenstein, and of other social constructionist theories. (See Ehn, Winograd 1995, and Winograd and Flores 1986 for detailed explanations of the theoretical grounding of usability research). In a purely practical sense, therefore, usability research can help us both as teachers and researchers. We not only generate usable data that affects design and instruction, we also generate qualitative data that can be reported in journals and that may prove compelling to others on our campuses. (i.e., a director of computer resources might find the results of a usability study more convincing than other types of evidence).

What usability research offers us, therefore, is the chance to do action research, to do teacher-initiated research that can satisfy the need both for change and for publication. "Action research by insiders, with a consultant linking them to outside perspectives, is well suited to studies of technology and literacy," Zeni writes:

> For the reflective teacher, action research is a way to solve problems, change patterns, and improve instruction. For the scholar, action research is a way to investigate something that won't sit still long enough for a controlled experiment. For the critical educator, it is a way to put educational decisions in the hands of the teachers and students who will live with them. (85)

Usability research methods, though not perfect, are adaptable to the study of networked computers and writing centers. They provide one way to reflect critically upon the interaction between users, environments, etc., not by helping us build abstract models by which to design networked technologies for writing centers, but by helping us to observe and reflect upon tutorial interaction mediated by networked computers.

FOR FURTHER READING

Those interested in learning more about usability research might consult some of the following resources (full citations appear in the works cited):

The Usability Methods Toolbox - This well organized website, compiled by James Hom, offers an overview of usability methods as well as an extensive, partially annotated bibliography. The URL (as of early 1998) is http://www.best.com/~jthom/usability/

Usability: Turning Technology into Tools - This collection, edited by Paul S. Adler and Terry A. Winograd, offers a variety of essays on usability. Some of the essays are theoretical, and some of them are accounts of actual tests. This book is a good place to start if you're looking for a thorough introduction to the subject of usability.

Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests - Written by Jeffrey Rubin, this book offers practical "how to" advice. It can be read like a reference work.

Usability Engineering - Though Nielsen's book is intended for engineers and others working in industry, many of his suggestions can be adapted for writing centers. For example, he offers a series of useful questions to help plan a test—questions about the goals of the test, test subjects, necessary equipment, and testing methods (see 170-171). He also offers helpful reminders about test budgets (171-174) and pilot testing (174-175).

NOTES

1. I wish to thank Muriel Harris, William Hart-Davidson, and Eric Hobson for their patience in reading drafts of this chapter and for sharing their insights with me.
2. For more on the role of theory in conflicting accounts of technology use, see Blythe (1997).
3. Though the students that Harris surveyed during the early phase of Purdue's OWL expressed enthusiasm for using email to connect with tutors, few actually used the system once it was in place. This probably happened because the most common email programs available to students prohibited the insertion of existing files, such as text files from other word processing programs. Consequently, students at Purdue seldom used email to exchange papers. Instead, they used email as a kind of grammar hotline through which they posed short questions about such issues as punctuation, spelling, and MLA or APA documentation. For an account of Harris's early experience with predicting student computer use, see Blythe, Stuart, et al., (1998).
4. Patricia Sullivan (1989) differentiates between usability research and usability testing. Jacob Nielsen (1993) makes a similar distinction in when he refers to "usability testing" and "assessment methods beyond testing" (see chapters six and seven). I use the term "usability testing" to refer to a range of tests often conducted near the end of product development. Such tests are designed to ensure that a product is "usable" for clients and consumers. "Usability research," on the other hand, need not be tied so directly to product testing; rather, it is intended to yield insights into how people use tools in specific situations. The immediate goal of usability research is insight into human-computer interaction, while the immediate goal of usability testing is making humans fit in with, or accept, a technology. I am indebted to William Hart-Davidson for alerting me to this distinction between research and testing. Hart-Davidson is applying usability research methods to the study of teacher training for networked computer classrooms.
5. I take the distinction between "insight" and "Truth" from Duin and Hansen's argument for a "social perspective" in the research of computers and writing. Though Duin and Hansen argue specifically for such a perspective in nonacademic writing, their call for a social perspective, for studying "the ways writers apply their social, political, and cultural experiences to their interpretation and construction of audience; and the ways context inhibits or enables writers to form ideas and transfer them to others" (7) resonates with calls from others for situated studies of human-computer interaction. For example, see Ehn (1992); and Suchman (1987). The approach is equally relevant in writing center scholarship, especially because a sense of place is so important to a writing center's identity.

6.   When I discuss usability research, I am not referring to "human factors" engineering in which engineers attempt to "fit" humans into the design of technological systems. As Adler and Winograd point out, this more traditional form of technological design views users as parts of a mechanical process; a human is treated essentially as a component of a technological system. Such approaches reduce users to little more than cogs in a machine, and troublesome cogs at that. When breakdowns occur, engineering experts and their technological accolytes are likely to blame the user, rather than poor design. (Anyone who has tried to get help from a condescending computer lab assistant knows what it's like to be blamed for a technological breakdown.) This version of usability, with its emphasis on deskilling workers, subordinates humans to technology and "engineering experts" who, according to Adler and Winograd, are often "accorded the central role" in such approaches to design (4).

7.   Though I cannot claim to have studied a representative sample of users, none of the people I have ever asked have wanted a video link during distance conferencing. Though almost all users have appreciated having an audio connection, all have felt that the video link is a mere distraction. With the technology available to most people right now, a video link hurts system performance significantly anyway.

8.   The logs, when gathered, revealed a number of significant insights into such things as the difficulty of setting goals and the intricacies of turn taking online. One observer noted in her log, for example, that the student found it difficult to wait for a tutor's response. (Interestingly enough, the student didn't mention this problem in her log). The student's possible difficulty with waiting for a response seems reasonable because most students are anxious for feedback when a tutor reads their papers, but the lack of f2f contact online denies a student any chance to read the tutor's face for certain cues.

APPENDIX

The two logs included in this appendix were used by tutors during the Spring of 1997. They were used as prompts to aid reflection following tutorials mediated by the conferencing protocol, *Enhanced CU-SeeMe*, by White Pine.

The two-page observation log prompted observers to do two things during the tutorial: (1) to describe (as neutrally as possible) what they observed and (2) to reflect on what they saw. The log also prompted them to reflect on the tutorial afterwards. The one-page participant log prompted students and tutors to reflect on their tutorial after it was over.

The term "logistics" refers to tasks that were necessary in order to support the actual work of a tutorial, tasks such as calling up computer programs, copying and sharing files, and making sure audio connections were working.

Observation Log

DURING THE TUTORIAL

As you observe the tutorial, please describe what is happening and use the grid following to comment on what you see. The description should include only a reporting of facts, and the comments should include your thoughts on why you think things are happening as they are. Record anything that you think is important, but also be sure to pay attention to such issues as

- How tutor and student listen to each other and attempt to clarify what they're hearing
- How tutor and student take turns talking, listening, reading, and writing
- How tutor and student deal with silences

AFTER THE TUTORIAL

To help recap what you've seen, please respond to the following questions:

What was the tutorial about?

How long did the tutorial take?

How much time was spent on logistics versus tutoring?

What kinds of logistical tasks were necessary for the tutorial?

	Description	*Comments*
How did the session begin?		
How did the tutor discover the student's problem?		
How did the tutor and student set a task for the tutorial?		
How did they complete that task?		

How did the session end?		

Participants' Logs

After your session, please address the following questions:

What was the tutorial about?
How long did the tutorial take?
How much time was spent on logistics versus tutoring?
What kinds of logistical tasks were necessary for the tutorial?
What aspect of the tutorial worked best? why?
Which aspect of the tutorial could have worked better? why?
Which medium would you have preferred for this tutorial? why?