

## **Introduction to Workplace Studies: Ethnomethodological Approaches**

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### **Course Description**

Workplace studies, or ethnographic studies of work as the field is also known, have emerged as an alternative to traditional studies of the work, workplaces, and occupations. Rather than relying on narrative or symbolic (e.g. quantitative) representations of the workplace, Workplace Studies approaches seek to understand the details of work as an everyday and on-going social accomplishment. While much of the field is devoted to studying the use of technology at work, and the way that technology can change work, the inclusion of technology as a focus is not required. Rather the goal is to understand how work is accomplished by individuals in social and collaborative environments. Even when studying one person, s/he is embedded in a social context to which s/he must be accountable. Thus, all work is social. By attending to an interactional level of analysis, the researcher tries to attain an "insider's perspective" regarding the explicit and tacit ways in which work is done. Through this approach, a better understanding of the social organization of work is achieved.

The course will examine the theory and methods behind this approach, as well as examine examples of Workplace Studies and Ethnographies of Work research. While not all work done in this space is done by those who would self-identify as ethnomethodologists, we will be examining the doing of this kind of research through an ethnomethodological lens and exploring the impact that EM is having on fields beyond workplace studies. Students will develop the competencies necessary to carry out such a project, and gain first-hand experience carrying out their own projects. Finally, students will learn how to communicate their findings in written and oral formats to academic and professional audiences.

### **Readings**

The readings will all be provided in pdf format, and will primarily be comprised of articles and book chapters. Any reading list in a course of this scope is going to be woefully incomplete. Also, while it is hoped that you will complete the readings, given your other responsibilities it may be difficult to do so. Thus, students are encouraged to work together in order to cover as much ground as possible. A recommended book list will be provided for those who wish to do further exploration of the topic, but will not be required for the course.

**Learning Objectives:**

Through this course, students will acquire the following:

**Knowledge**

- a) learn about theories and perspectives concerning how to conduct workplace studies research and evaluate technologies in workplace settings;
- b) learn about methods used in the in-situ exploration of work and how technologies integrate and impact work
- c) understand social factors that can influence design, implementation, and use of technology;
- d) learn how to evaluate and analyze data and present information in a synthesized format
- e) identify barriers to ethnographic research, and develop strategies to overcome those barriers

**Skills**

- a) apply theories to the exploration of work and technological implementation and impacts;
- b) develop research designs using single and mixed-method approaches in actual explorations of technology at work;
- c) communicate findings in written and oral presentation formats;
- d) evaluate other presentations and provide recommendations on improvement.
- e) develop social brokering skills necessary to bridge worker and management perspectives in design and implementation

**Attitudes**

- a) gain an understanding of the beneficial and disruptive impacts of major technological changes on work;
- b) develop ideas of how to better inform design so that it can better facilitate and empower workers;
- c) appreciate the difference between work processes and practices, as well as idealized technological use versus actual (often) improvised use

**ACADEMIC HONESTY STATEMENT - THE BENTLEY HONOR CODE:**

I would assume that the Higher School of Economics has its own Honor Code regarding the academic conduct of students. But since I cannot read Russian very well, I have included the Bentley University Honor Code. If someone wants to translate for me the HSE honor code, I'll gladly include it!

*The students of Bentley, in a spirit of mutual trust and fellowship, aware of the values of a true education and the challenges posed by the world, do hereby pledge to accept the responsibility for honorable conduct in all academic activities, to assist one another in maintaining and promoting personal integrity, to abide by the principles set forth in the Honor Code, and to follow the procedures and observe the policies set forth in the Academic Integrity System.*

## **ASSIGNMENTS**

All assignments are expected to be turned in **on-time**. If you will not be able complete the assignment for the specified date, you must notify the instructor beforehand.

<b>Class Participation</b>	<b>20% of Final Grade</b>
The classroom is an interactive environment, where students are expected to not only come to class, but also be prepared to participate in classroom discussions, be they in small groups or large discussion format. For the class to be successful, it is important that everyone participate. <b>Simply coming to class does not constitute class participation.</b> Approximately one-third of class participation is composed of coming to class and two-thirds of participating in class.	
<b>Data Collection Assignments</b>	<b>4 x 10 = 40% of Final Grade</b>
Since ethnography typically is focused on being in “the field”, your data collection should occur at a particular site or location (or across similar locations). Throughout the semester, students will be responsible for 4 data collection assignments in which they investigate some aspect of the field setting. For the completed assignments, you are to provide some kind of data analysis using the course materials, as well as any other materials that you find relevant. It is expected that as you have repeated exposure to your data collection site, and your understanding of ethnographic research develops, your assignments will reflect this. Ideally, you will focus on one site throughout the semester, allowing for your notes, observations, and assignments to become more refined. Assignments will be no less than five pages in length, although students can write more if they wish. Students will also be responsible for discussing their assignments during group discussion periods scheduled throughout the semester. Dues dates of the field notes will be provided.	
<b>Workplace Studies Paper</b>	<b>30% of Final Grade</b>
Students will be responsible for a final paper, which will be built on their field assignments to present a final ethnographic research paper. The papers will be 12-17 pages in length, in English and will include a theoretical and methodological component, as well as data analysis. A separate handout will be distributed detailing the specifics of the final paper, in terms of composition, length, citation style, etc.	
<b>Workplace Studies Paper Presentation</b>	<b>10% of Final Grade</b>
During the last session of the course, each student will be responsible for leading a brief class discussion on their research paper topic. This is not simply a class presentation per se. Rather, students are expected to raise questions regarding their topic and stimulate class thought and discussion. During this time, the student will act as the class instructor, attempting to deliver information to the class and raise their general awareness of the topic.	

**The professor reserves the right to change the above outline regarding class assignments**

## **CLASS ATTENDANCE, PARTICIPATION, AND PREPAREDNESS**

Any college course implies a contract between the student and professor. Both are expected to be in class, prepared to cover the material of the day, and take the necessary steps to make the classroom an environment of cooperative learning. While Centra may be used for the course, it is important that the student not depend solely on taped lectures, as a tape is not a substitute for what occurs in-situ.

All students are required to have completed the assignments on time. Failure to do so will result in a reduction of your grade on that assignment. All students are also required to attend class. It is up to the professor to determine what constitutes an excused absence. If you are to arrive late or leave early, you need to talk with the professor beforehand.

Students are also expected to participate in class discussion by answering questions, offering opinions, providing their own past experiences, and generally making the class an environment of cooperative learning.

Finally, presenting other people work as your own and not providing appropriate citation to others' works or ideas is deemed plagiarism. Information on plagiarism can be found at [www.turnitin.com](http://www.turnitin.com) and [www.plagiarism.org](http://www.plagiarism.org).

The grading scale used in the class will follow that recommended by Bentley College. Passing grades for graduate students range from a high of 4.0 to a low of 2.3. Since I am not familiar with the HSE grading scale, or what kinds of grades are typically provided, I have included the Bentley University graduate school grading scale. If I can find the HSE grading scale, we will use that one instead.

	Grade in Quality Points	Alphabetical Equivalent	Numerical Equivalent
Excellent	4.0	A	95-100
Above Average	3.7	A-	90-94
Above Average	3.3	B+	87-89
Average	3.0	B	83-86
Average	2.7	B-	80-82
Average	2.3	C+	77-79
	0.0	F	Below 77

#### What do the Grades mean?

**A range** Superior work, exhibits originality, clarity, precision, and depth

**B+ to B** Good work, contents of course firmly in control and handled with some mark of distinction

**B- to C+** Competent work, control of most of the content of course evident

**F** Failure to meet requirements

All students are encouraged to approach the professor if there is any discrepancy between the grade received and the grade expected. **Don't e-mail requests for explanations.** If you wish to petition for a grade change on an assignment or your final grade, you are to talk with the professor, and then to submit your disagreement in written form, presenting your case to the professor thoroughly.

## COURSE OUTLINE

This course is a work-in-progress, meaning that we will likely have to adapt and adjust as the course progresses. But, this at least gives the broad outlines of what we will be exploring.

### **SESSION #1 - HSE ON-SITE (JANUARY 15<sup>TH</sup> TO 22<sup>ND</sup>)**

The goal of this period is to give you a general understanding of ethnography, ethnomethodology, and conversation analysis. You might already have some of this, but it is a good opportunity to (re)introduce it. By the end of this session, you should have: 1) be aware of important issues regarding human subjects protections and research ethics; 2) have an introductory knowledge of the field of ethnographic research; 3) begin developing the ability to capture details of everyday life; and 4) reach an understanding of the relationship between EM and CA, and how it fits into ethnographic studies of work.

#### **Session #1 Modules**

**Course Introductions:** Who are you? What your professional goals in and out of sociology? What do you hope to gain from the course?

**Field assignment discussion:** What did you do? What did you find?

**Research ethics and human subjects protections:** history of research ethics and protections; key concepts (e.g. anonymity, confidentiality, informed consent, minimal risk); Institutional Review Boards

- US National Institute of Health. *Protecting Human Research Participants*.  
<http://phrp.nihtraining.com/>

**Introduction to Ethnography:** Theoretical foundations; Historical development; Goals and objectives; Comparison of Naturalistic Inquiry with EM and CA

- Denzin, Norman (1971) The logic of naturalistic inquiry. *Social Forces*, 50(2):166-182.
- Emerson, Robert M. (1981) Observational Field Work. *Annual Review of Sociology*, Vol. 7, pp. 351-378.
- Hammersley, Martyn & Paul Atkinson (1995) Chapter 1: What is ethnography? In *Ethnography: Principles in Practice*. London, UK: Routledge.
- Harper, Richard (1998) Chapter 3: Designing Ethnography. In *Inside the IMF: An Ethnography of Documents, Technology and Organisational Action*. New York: Academic Press.

**Gestalts and “Seeing Sociologically”:** Exercises in the organization of our perceptual field, etc.

- Geertz, Clifford (1973) Thick description: toward an interpretive theory of culture. In *The interpretation of cultures: selected essays*. New-York, N.Y.: Basic Books, pp. 3-30.
- Goodwin, Charles (1994) Professional vision. *American Anthropologist*, 96(3):606-633.
- Rawls, Anne (2006) Respecifying the study of social order – Garfinkel’s transition from theoretical conceptualizations to practices in details. In H. Garfinkel *Seeing Sociologically: The Routine Grounds of Social Action*. Boulder, CO: Paradigm Press.

**Ethnomethodology, Conversation Analysis & Ethnography:** Theoretical origins of EM & CA; historical development; differences and similarities; EM & CA within sociology and across disciplines.

- Garfinkel, H. (1996) Ethnomethodology’s program, *Social Psychology Quarterly*, 59, 1, 5-21.
- Garfinkel, Harold and Harvey Sacks (1970) On formal structures of practical actions. In *Theoretical Sociology: Perspectives and Developments*, edited by J.C. McKinney and E. Tiryakian.

- New York, NY: Appleton-Century-Crofts. Pp.337-366.
- Goodwin, Charles (1980) Restarts, pauses, and the achievement of a state of mutual gaze at turn-beginning. *Sociological Inquiry*, 50(3-4):272-302.
  - Maynard, Douglas (2003) Conversation analysis and ethnography: What is the context of an utterance? In *Bad News, Good News: Conversational Order in Everyday Talk and Clinical Settings*. Chicago, IL: The University of Chicago Press.
  - Maynard, Douglas W. and Steven E. Clayman (1991) The Diversity of Ethnomethodology. *Annual Review of Sociology*, Vol. 17, pp. 385-418.
  - Schegloff, Emanuel A. (1986) The routine as achievement. *Human Studies*, 9(2-3):111-151.

### **SESSION #2: VIRTUAL CLASS (MID-JANUARY TO MID MARCH)**

During this period, you will be responsible for continuing data collection in whatever venue you can. Along with your data collection, we will be reviewing a very important concept in doing ethnography: culture. Culture is a very tricky thing to define, and it has been subjected to repeated limited definitions and used as a predictive variable ("People of culture x are like this."). So we need to expand our definition. We also will be looking at the concept of *membership categorization* as an important element in EM & CA. It is not required that you read all the materials below, or that you are limited to these materials. This is meant to be a common starting point from which we can expand our discussions and analysis.

Finally, you are to continue your CA skills through some on-line materials available at the following sites. This will be self-paced and at your discretion.

- Charles Antaki, Professor of Language and Social Psychology, Department of Social Sciences, Loughborough University  
<http://www-staff.lboro.ac.uk/~ssca1/sitemenu.htm>
- Emanuel Schegloff, Professor Emeritus, Department of Sociology, University of California-Los Angeles  
<http://www.sscnet.ucla.edu/soc/faculty/schegloff/TranscriptionProject/index.html>

#### **The Concept of Culture:**

- David, Gary C, Donald Chand, Sue Newell, Joao Resende-Santos (2008) "Integrated collaboration across distributed sites: the perils of process and the promise of practice. *Journal of Information Technology*, 23(1) 44-55.
- Sanders, Robert E. (1999) The impossibility of a culturally contextualized conversation analysis. *Research on Language and Social Interaction*, 32(1&2): 129-140.

#### **Membership Categories:**

- David, Gary C. and Paul Jalbert (2008) Undoing degradation: the attempted 'rehumanization' of Arab and Muslim Americans. *Ethnographic Studies*, 10.
- Leudar, Ivan, Victoria Marsland and Jirí Nekvapil. (2004) On membership categorization: 'Us', 'Them' and 'Doing Violence' in Political Discourse. *Discourse and Society*, 15(2-3):243-266.
- Schegloff, Emanuel (2007) A tutorial on membership categorization. *Journal of Pragmatics*, 39:462-482.

#### **Communities of Practice:**

- Wenger, Etienne C. and William M. Snyder (2000) Communities of Practice: The Organizational Frontier. *Harvard Business Review*, January–February.
- Wenger, Etienne (1998) Communities of Practice: Learning as a Social System. Published in "Systems Thinker."

#### **National Culture:**

- Myers, Michael D., and Felix B. Tan (2002) "Beyond models of national culture in information systems research." *Journal of Global Information Management* 10.1 (Jan–March): 24(9).
- Osland, Joyce S, Allan Bird, June Delano and Mathew Jacob (2000) Beyond sophisticated stereotyping: cultural sensemaking in context. *The Academy of Management Executive*, 14(1):65-80.

#### **Race and Ethnicity:**

- Wieder, D. Lawrence, Steven Pratt (1990) 'On being a recognizable Indian among Indians'. In: D. Carbaugh, ed. *Cultural communication and intercultural contact*. Hillsdale: Erlbaum: 45-64
- Anne Warfield Rawls(2000).Race" as an Interaction Order Phenomenon: W.E.B. Du Bois's "Double Consciousness" Thesis Revisited. *Sociological Theory* 18 (2):241-274.

#### **Localities and Culture:**

- Zukin, Sharon (1987) Gentrification: Culture and Capital in the Urban Core. *Annual Review of Sociology*, 13:129-147.
- Charles, Camille Zubrinsky (2003) The Dynamics of Racial Residential Segregation. *Annual Review of Sociology*, 29:167-207

#### **GenderCulture:**

- West, Candace and Don. H. Zimmerman (1987) Doing gender. *Gender and Society*, 1(2):125-151.

#### **Professions and Epistemic Cultures:**

- Van Maanen, J. and S. Barley (1984). "Occupational Communities: Culture and control in organizations." *Research in Organizational Behavior*, 6: 287-365.

#### **Organizational / Workplace Culture:**

- Ailon-Souday, Galit and Gideon Kunda (2003) The Local Selves of Global Workers: The Social Construction of National Identity in the Face of Organizational Globalization. *Organization Studies* 24(7): 1073-1096.
- Ouchi, William G. and Alan L. Wilkins (1985) Organizational Culture. *Annual Review of Sociology*, 11:457-483.

#### **Virtual Communities:**

- Granovetter, M.S. (1983) The strength of weak ties: a network theory revisited. *Sociological Theory* 1:201-233.
- Levin, D.Z. and R. Cross (2004) The strength of weak ties you can trust: the mediating role of trust in effective knowledge transfer. *Management Science* 50:1477-1490.
- Papadakis, M.C. (2003) Computer-mediated communities: the implications of information, communication and computational technologies for creating community online. SRI International Project Number P10446.004
- Ruhleder, Karen(2000) The Virtual Ethnographer: Fieldwork in Distributed Electronic Environments. *Field Methods*, 12(1):3-17.
- Symons, J. and Stenzel, C.(2007). Virtual borderless: an examination of culture in virtual teaming. *Journal of General Management*, Vol. 32, No. 3, 1-17.

### **SESSION #3: HSE ON-SITE (APPROXIMATELY MARCH 7-20<sup>TH</sup>)**

In Session #3 we are going to be focusing on conducting ethnographic research in workplace settings. We will be comparing a variety of approaches, some of which are ethnomethodological and some of which are not. It is important that you are aware of these various approaches, as well as how they compare to ethnomethodological inquiry. There may be times when you are working in teams and you need to identify the value that you are adding with your approach, as well as talk about approaches that might be more familiar to your audience. We also will be talking about practical issues related to gaining access to research sites and developing proposals for them. Finally, we will continue to explore your own data and engage in collaborative data sessions.

#### **Session #3 Modules**

**Data and Reading Discussions:** We will be discussing what data you have collected, how you did it, the challenges you faced, and how you dealt with them. We also will be discussing the past readings.

#### **Ethnomethodology and Workplace Studies:**

- Crabtree, Andy, David M. Nichols, Jon O'Brien, Mark Rouncefield, Michael B. Twindale (2000) Ethnomethodologically informed ethnography and information system design. *Journal of the American Society for Information Science and Technology*, Vol. 51, Iss. 7; pg. 666
- Llewellyn, Nick (2008) Organization in Actual Episodes of Work: Harvey Sacks and Organization Studies. *Organization Studies*, vol. 29, no. 5, pp. 763-791.
- Plowman, Lydia, Yvonne Rogers and Magnus Ramage (1995) What Are Workplace Studies For? Cooperative Systems Engineering Group. Technical Report : CSEG/12/1995
- Rawls, Anne Warfield (2008) Harold Garfinkel, Ethnomethodology, and Workplace Studies. *Organization Studies*, 29(5), 701-732.

#### **EM in Institutional Settings:**

- Goode, David A. (1990) On Understanding without Words: Communication between a Deaf-Blind Child and Her Parents. *Human Studies*, 13(1):1-37.
- Livingston, Eric (2006) The context of proving. *Social Studies of Science*, 36(1): 39-68.
- Macbeth, Douglas (1996) The discovery of situated worlds: analytic commitments, or moral orders? *Human Studies*, 19(3):267-287.
- Meehan, Albert Jay (1989) Assessing the “police-worthiness” of citizen complaints to the police: accountability and the negotiation of “facts.” In *The Interaction Order: New Directions in the Study of Social Order*. David T. Helm, W. Timothy Anderson, Albert Jay Meehan and Anne Warfield Rawls (eds) New York: Irvington Publishers, Inc. Pp.116-140.
- Pollner, Melvin and Lynn Wikler-McDonald (1985) The social construction of unreality: a case study of a family’s attribution of competence to a severely retarded child. *Family Process*, 24(2):241-254.
- Suchman, Lucy (2000) Making a case: ‘knowledge’ and ‘routine’ work in document production. In *Workplace Studies*. Paul Luff, Jon Hindmarsh and Christian Heath (eds) Cambridge: Cambridge University Press:29-45.
- Whalen, Jack and Erik Vinkhuyzen (2000) Expert systems in (inter)action: diagnosing document machine problems over the phone. In *Workplace Studies*. Paul Luff, Jon Hindmarsh and Christian Heath (eds) Cambridge: Cambridge University Press: 92-140.

#### **CA in Institutional Settings:**

- Clayman, Steven E. (1993) Reformulating the question: a device for answering/not answering questions in

news interviews and press conferences. *Text*, 13(2):159-188.

- Drew, Paul (1992) Contested evidence in courtroom cross-examination: the case of a trial for rape. In *Talk at Work: Interaction in Institutional Settings*. Paul Drew and John Heritage (eds). Cambridge: Cambridge University Press. Pp.470-520.
- Halkowski, Timothy (2006) Realizing the illness: patients' narratives of symptom discovery. In *Communication in Medical Care: Interactions between Primary Care Physicians and Patients*. John Heritage and Douglas W. Maynard (eds) Cambridge: Cambridge University Press.
- Health, Christian (1989) Pain talk: the expression of suffering in the medical consultation. *Social Psychology Quarterly*, 52:113-125.
- Heritage, John (1997) Conversation analysis and institutional talk: analyzing data. In *Qualitative Research: Theory, Method, and Practice*. David Silverman (ed). London: Sage. PP.161-182.
- Whalen, Marilyn R. and Don H. Zimmerman (1987) Sequential and institutional context in calls for help. *Social Psychology Quarterly*, 50(2):172-185.

### **Ethnography, Work and Technology:**

- Anderson, Bob (1997) Work, Ethnography, and Systems Design. In *The Encyclopedia of Microcomputers*, Vol. 20, A. Kent and J.G. Williams (eds.), Marcel Dekker, New York, pp 159-183.
- Anderson, R.J. (1994) Representations and requirements: the value of ethnography in system design. *Human-Computer Interaction*. 9(3): 151-182
- Button, Graham and Richard Harper (1995/1996) The Relevance of 'Work-Practice' for Design, *CSCW4*: 263-280.
- David, Gary C., Angela Cora Garcia, Anne Warfield Rawls and Donald Chand (2009) Listening to what is said-transcribing what is heard: the impact of speech recognition (SRT) on the practice of medical transcription (MT). *Sociology of Health and Illness*, 31(6):924-938.
- Harper, R.H.R. (1998) Chapter 3: Designing Ethnography. In *Inside the IMF*. London: Academic Press Limited.
- Harvey, Lynda J. and Michael D. Myers (1995) Scholarship and practice: the contribution of ethnographic research methods to bridging the gap *Information Technology & People* 8(3): 13 – 27
- Hughes, John, Val King, Tom Rodden, and Hans Andersen (1994) Moving Out from the Control Room: Ethnography in System Design. *CSCW 94- 10/94* Chapel Hill, NC, USA

### **Computer Supported Cooperative Work (CSCW):**

- Bannon, Liam J. (1993) CSCW: An Initial Exploration. *Scandinavian Journal of Information Systems*, Vol. 5, pp. 3-24.
- Harper, R.H.R. (2000) The Organisation in Ethnography – A Discussion of Ethnographic Fieldwork Programs in CSCW. *Computer Supported Cooperative Work: The Journal of Collaborative Computing*, 9(2):239-264.
- Hartswood, Mark, Rob Procter, Mark Rouncefield and Roger Slack (2003) Making a Case in Medical Work: Implications for the Electronic Medical Record. *Computer Supported Cooperative Work: The Journal of Collaborative Computing*, 12(3):241-266.

### **Workplace Studies and Design:**

- Button, Graham and Paul Dourish "Technomethodology: Paradoxes and Possibilities."
- Crabtree, Andy and Tom Rodden. Ethnography and Design?
- Dourish, Paul (2006) Implications for Design. CHI 2006. April 22-27. Montreal, Canada.
- Dourish, Paul and Graham Button (1998) On 'Technomethodology': Foundational Relationships between Ethnomethodology and System Design. *Human-Computer Interaction*, 13: 395-432.
- Hughes, John A., Ian Somerville, Richard Bentley and Dave Randall (1993) Designing with Ethnography: Making Work Visible. *Interacting with Computers*. 5(2): 239-253.

- Moore, Robert J. (2010) Computer interaction analysis: toward an empirical approach to understanding user practice and eye gaze. Unpublished manuscript.

#### **SESSION #4: VIRTUAL CLASS (APPROXIMATELY LATE MARCH TO EARLY MAY)**

The bulk of this time is going to be devoted to further exploration of the reading materials and the student's own data collection, as well as data analysis. You also will be beginning to craft a final paper based on the course reading materials, discussions, as well as any other supplemental materials that you find. There are no assigned readings for this period, although materials may be provided to help individual students with their projects.

#### **SESSION #5: HSE ON-SITE (APPROXIMATELY MAY 16-29<sup>TH</sup>)**

Session #5 will be the culmination of the course. The majority of the time will be spent on final data analysis and preparation of final written and oral presentation materials. Students will present their findings during the final week of the course. We also will review the materials that have been discussed during the previous sessions. Finally, some discussion will be made of alternative approaches to ethnmethodological studies of work, such as the use of design and usability labs, contextual inquiry, rapid ethnography, and individualistic human-computer interaction frameworks.

#### **Session #5 Modules**

**Data and Reading Discussions:** We will be discussing what data you have collected, how you did it, the challenges you faced, and how you dealt with them. We also will be discussing the past readings.

#### **Design and Usability Testing**

- Hughes, Michael (1999) Rigor in Usability Testing. *Technical Communication*, 488-495.
- Kushniruk, Andre W, Vimla L. Patel, and James J. Cimino (1997) Usability testing in medical informatics: cognitive approaches to evaluation of information systems and user interfaces. *Proceedings of the American Medical Informatics Association*. Pp.218-222.
- Macaulay, Catriona, David Sloan, Xinyi Jiang, Paula Forbes, Scott Loynton, Jason R. Swedlow, and Peter Gregor (2009) Usability and user-centered design in scientific software development. *IEEE Software*, January:96-102.
- Nielsen, Jakob (1992) The usability engineering life cycle. *Computer*, 25(3): 12-22.

#### **Testing in the Field**

- Kaikkonen, Anne, et al. (2005) Usability testing of mobile applications: a comparison between laboratory and field testing. *Journal of Usability Testing*, 1(1):4-16.
- Kaufman, David R., Vimla L. Patel, Charlyn Hilliman, Philip C. Morin, Jenia Pevzner, Ruth S. Weinstock, Robin Goland, Steven Shea, and Justin Starren (2003) Usability in the real world: assessing medical information technologies in patients' homes. *Journal of Biomedical Informatics*, 36:45-60.
- Rosenbaum, Stephanie and Laurie Kantner (2007) Field usability testing: method, not compromise. *IPCC Proceedings*.
- Wixon, Dennis, Karen Holtzblatt, Stephen Knox (1990) Contextual Design: An Emergent View of System Design. *CHI 1990 Proceedings*.