
Collecting online data with usability testing software

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Abstract

Although the internet can no longer be described as a new phenomenon, the growth of its social structure together with the emergence of social interaction hold potential for new research methods. This paper explores the development of participant observation linked with usability testing to conduct online research. The application of usability testing tools has the potential of collecting, analysing, and presenting dynamic data that was previously difficult to capture with more traditional tools. Advantages, limitations, ethical considerations, and future directions of this pairing method are discussed.

Introduction

The rapid changes taking place in society are reflected in the theoretical developments across various disciplines. The emergence of new methods of research is driven by such changes, and new questions are posed for investigation. With these new questions, new evidence is required, which give rise to new data collection techniques (Hesse-Biber & Leavy, 2008). New forms of data collection and analysis are being conceived, and existing data collection methods are being adapted to study new literacies in several disciplines, including communications, media, education, and public relations. They are being adapted for different reasons, such as using methods that are consistent with the data being collected. Although the internet can no longer be described as a new phenomenon, the growth of its social structure together with the emergence of social interaction hold potential for new research methods.

The web environment is constantly changing; it is shifting from the state of being

read-only toward read/write and cooperation states. This shift can be seen as online environments transition through Web 1.0, 2.0, and 3.0. For example, how users are contributing to the web and connecting with one another are critical Web 2.0 concerns and their searching and consuming habits become important Web 3.0 components. In the attempt to keep up with these shifting technologies and consequently literacies, new methods of data collection and analyses are constantly developing because these more dynamic structures of the web require more dynamic data collection tools.

Carmen Luke (2003) suggests the following:

The texts of the new technologies have mutated into complex, hybrid semiotic systems that have made new demands on reading and writing, viewing, social exchange, and communication. These, in turn, require multi-methodological and interdisciplinary analyses of the social and cultural, and the semiotic and linguistic. New media and complex connectivity generate new research questions that require new analytic tools as well as innovative combinations of the old with the new. (p. 401)

To productively study dynamic interaction with new forms of text and media, researchers from several disciplines need to explore the many facets of internet literacy (Nixon, 2003). New instruments used in usability testing can therefore transition well for online participant observation in both experimental studies as well as ethnographies.

An array of methods is being adopted by qualitative and quantitative methodological approaches, ranging from comparative ethnography studies to mixed approaches

encompassing “surveys, interviews, diaries, focus groups, observation, documentary and historical analysis, and experimental or comparative studies” (Hesse-Biber & Leavy, 2008, p. 532). While these can be seen as a return to traditional methods of research, the new proposed approaches imply a combination of methods, in which ethnography is one of the essential parts. For example, Hine’s virtual ethnography (2000, 2008) and Leander’s connective ethnography (2008) combine online participation, observation and exploration of context. Following this pattern of finding strategies to study online spaces, this paper explores the development of participant observation linked with usability testing to conduct online research. Advantages, limitations, ethical considerations, and future directions are discussed.

Overview

Participant observation is one technique used to conduct online research. For example, it is used to explore the complex connections between online and offline spaces (Fielding, Lee, & Blank, 2008, Leander, 2008). Considering the traditional model of ethnography, its most characteristic form involves participation, overtly or covertly, by watching, listening, and collecting information that will “throw the light on the issues that are the focus of the research” (Fielding, et al., 2008, p. 259). The acceptance of participant observation as a method in cultural anthropology strengthens its position amongst techniques such as interviewing, structured observation, and the use of questionnaires and formal elicitation techniques (DeWalt & DeWalt, 2002).

Challenges surround the observation and data collection of new uses of computers and it is difficult to analyse findings using our current methods (Nixon, 2003). Participant observation requires the presence of the researcher. When linking the traditional approach of participant observation with online research, the presence of the researcher and participants is not physical. The connection then is had through experience

and not through physical contact. Virtual travel to the field site consists of “experiential rather than physical displacement” (Fielding, et al., 2008). In both online and offline settings, researchers have used different observational methods including the naked eye and video. Using screen capture software with its enclosed analytical components may be one way to capture and analyse online data more productively, conveniently, and proficiently. Components of usability testing combined with screen capture software are quickly being included in participant observation of online social behaviours.

Key research questions that can be addressed using such tools include the following: How are participants communicating in online spaces? What navigating strategies are they using? What sites are they frequenting regularly and for what purposes? What applications are being used and for what purposes? Usability testing is used frequently in research studies where companies attempt to find out how well purchasers/users are able to use a product they intend to sell. It differs from Beta testing in that it tests products prior to putting them out in the market. Beta testing, on the other hand, is an early version of a product that companies hope to make changes to, based on the feedback they receive from users. Usability testing has become much simpler and cheaper to conduct with new software development. Laboratory settings are no longer necessary. Programs like TechSmith’s Morae Software can be used to capture users working with computer software. Because of these new applications, usability testing software now holds great potential for conducting other types of research as well. It is ideal for participant observation in online or offline computer settings.

The following are the five characteristics of usability testing as described by Dumas and Redish (1999):

- 1) The purpose of the test is to improve the usability of the product being tested.
- 2) The participants are actual/potential users of the product
- 3) The participants engage in authentic tasks.

4) The participants' actions and words are recorded

5) The collected data is analysed, problems are identified, and changes are recommended to address these problems.

These same principles play a large part in observing participants who engage in online settings that have nothing to do with the usability of a particular product which a company is trying to sell and, therefore, can be adapted well to capture and study the online social practices in the fields of communication, media, education, and public relations.

In conducting usability tests, tasks that are assigned must be ones that participants would normally do in the natural settings, such as home, school, or work. This means that the researcher must understand the user's environment and the tasks that they may want to accomplish (Dumas & Redish, 1999). This, too, is true of participant observation research using usability testing software.

Even when choosing naturalistic settings like the internet to conduct research, researchers sometimes choose to modify the natural setting for their research purposes or take an existing setting and add boundaries to it that would not normally exist. For example, Lawless, Schrader, & Mayall (2007) disabled external links and advertisements on a website that they used for their research. They left active only links that pertained to the topic of interest.

Much of usability testing focuses on identifying which features of a program users do not use, either because they are not aware of its existence or because its functionality is too difficult for users (Dumas & Redish, 1999). This is similar to what communication or public relations researchers may want to learn about the social behaviour practices of the public or what educational researchers may want to know about the digital practices of students. It is as important to know how participants are using the internet as it is to know how they are not using it. What features do they never use? Which sites do they not visit? What things are they not aware of?

Usability tests include visual observation of participants while they are using a product, auditory observation commenting on their performance, and compiling questionnaire or interview data about their experiences (Dumas & Redish, 1999). Again, these practices are shared with participant observation.

Dumas and Reddish (1999) state that usability tests are only effective if they manage to improve upon a particular product. Similarly, in participant observation, a researcher aims to detect struggles that participants face. Though the goal of participant observation is not to identify ways in which participants may be more successful in future tasks (Atkinson & Hammersly, 1994), the identification of the struggle itself may help in developing research questions and hypothesis to test for improvement in future studies.

With usability testing, usually only one user is tested at a time and there is no intervention unless it is specifically asked for, and this instance is recorded in the data as an instance of needed assistance (Dumas & Redish, 1999). In participant observation, intervention is not a usual part of the research. The researcher is not around to intervene (if recorded) nor would intervene because the goal is to find out what the user would naturally do in the next step. Sometimes, however, an active intervention technique is used with usability testing. This is when researchers sit close by participants and probe them with questions to solicit information as to their intentions and actions. This helps give researchers insight into the cognitive processing of the participants (Dumas & Redish, 1999).

Active intervention techniques go against the philosophy of participant observation, especially in ethnographic studies. To supplement the observed data, researchers frequently interview participants to get a deeper understanding of the observations. Using a think-aloud protocol during online participant observation activities can act as a type of interview and is a much subtler type of intervention that lessens intrusiveness. The participants themselves choose what information to share and what to leave out. Think-aloud sessions allow researchers to learn

about participants' objectives, intentions, and cognitive processing (Pressley, 2000).

Another method would be to allow the recording of the session to happen with no intervention or think-aloud, but later to go through the video with the participants and at that point have them verbally explain their process and probe them with appropriate questions. This, however, is a procedure that would require a high time commitment from both the researcher and the participants and as a result may not be worth the added advantage of having an untouched recording to analyse first. Moreover, relying on participants to recollect past decisions may not be as reliable as having them explain the process as they are experiencing it.

When conducting usability tests it is important to know what can be measured. Performance measures can capture the behaviours and actions of users whereas subjective measures can capture their views, feelings, and reasoning (Dumas & Redish, 1999). Performance measures provide quantitative data while subjective measures can provide both quantitative and qualitative data. For example, information on beliefs and feelings can be collected using Likert-type scales and analysed quantitatively. Some components that can be easily recorded and analysed include the number of errors a user makes, the length of time it takes to complete a task and the number of times a user gets frustrated.

For example, in one study, a co-author and I used Morae software along with a think-aloud protocol to capture adolescents' school internet use (Asselin & Moayeri, 2010). We were able to capture students' comments and facial expressions by using the software and webcams and was able to gain a rich understanding of students' views and feelings towards internet use for communication, socialising, and learning. Using the analytical and graphing tools of the software, we were also capable of conducting quantitative analysis of many features such as the time youth spent on social networks, the time it took them to accomplish a task, the average

time they spend on web pages and other representation of online social behaviour.

Likewise, Leu et al. (2009) conducted a study on the online reading comprehension of students using different types of think-aloud protocols linked with screen capture software (Camtasia), albeit without the analytical tools. They imported their data into other analytical software tools and were able to analyse the recordings both qualitatively for affective data and quantitatively for statistical information. This research tool fits well within most disciplines interested in studying online behaviour.

Advantages

One advantage of usability software is that it often comes with presentation and analysis components. Researchers can, therefore, use this software to conveniently organise and manage their data. The software allows for quick calculation of figures such as length of time spent on a site, how quickly results are selected, and how often the user right-clicked the mouse. With a mere push of a button, it can generate a list of all web pages visited during a session or produce all text entered onto the keyboard.

The software also assists in creating graphs, charts and other practical figures from the collected data. This assists in both analysis and presentation. For example, video clips and graphs can be created to import into presentation software to be later portrayed at conferences. Audience members can more clearly appreciate and understand a particular phenomenon if they view it through a video clip rather than only being told about the occurrence. The visual example gives a lasting impression and it shows that it is indeed a truthful observation. As a result, the validity of the data is increased.

Some regular problems that existed in the past with capturing data using a video camera have been solved with the new available technology. The following problems arose frequently with video cameras: difficulty viewing the computer screen as a result of the light's glare reflecting off the monitor, the angle that the shot was captured distorting the

image on the screen, and the participant's head or body parts blocking the screen (Dumas & Redish, 1999). Other problems included capturing synchronous video of both the screen and the users' facial expressions. Although those issues are now solved with screen capture software, other issues have arisen.

Limitations

One major limitation of usability testing paired with screen capture programs is the requirements to run the software. New versions of operating systems and fast hard drives are needed to run these programs. Without them, the researcher runs the potential of excluding participants who do not have adequate technological requirements on their computers. Furthermore, compatibility issues are likely to arise with the needed software and users' computers. For example, Morae software is presently not compatible with Macintosh operating systems. This raises the ethical issue of excluding Macintosh users from the research or creates an unrealistic environment of recording participants using computers that are not their own and operating systems with which they are not familiar. Providing the needed equipment to those who do not already own it would be taking a step closer to a laboratory setting which is not advisable.

Another challenge is purchasing appropriate equipment and software such as webcams and hard drives to capture and store data and then installing this equipment and software on the different computer systems of participants. This can become costly for the researcher and timely for both the researcher and participant. The time commitment is further increased as the researcher must learn how to work the software for capture, analysis, and presentation purposes and teach participants how to record using the software. During this process audio levels must be adjusted so that the recording is clearly audible for transcription and understanding. Moreover, it is important to update the software as it changes and to make the

appropriate changes to the collected data once updated.

In fact, the greatest challenge I faced with a recent study was installing the software on the school's computers. Even though I had received ethics approval from the school district and school principal, I still faced major challenges in getting clearance to install the software on school computers. With many institutions, technical work is not allowed to be done by outsiders such as researchers or even insiders such as employees. The work must be passed through the technical staff first for testing and approval and then for installation. This can be a lengthy process and can cause conflict within the institution between the technical staff and the administrative body who originally granted the permission. Therefore, it is as important to get permission and recommendations from the technical staff of an institution as it is from the administrators as union rules may be another obstacle.

Lastly, a major problem with capturing video data is the large amount of storage space it occupies on computers. This affects both the participant and the researcher. For screen capture software, the participant needs to save the recording on his/her computer hard drive or on an external drive. This takes up a large portion of space and can slow down the computer and other applications on the computer. This could infringe on the participant's computer use outside of the research and that of others using the computer, such as family members or colleagues. Therefore, it would be advisable for the researcher to provide an external drive to each participant on which to store the video data or the researcher needs to constantly visit the participants and remove the data from their computers.

Researchers will face even greater space issues on their computers for two reasons. First, they will have to store all participants' data and second they will be using the software for collecting, analysing, synthesising, and preparing presentations. To avoid space concerns, it would be worthwhile for researchers to have a large external storage space to store the videos and to work from this

external drive in analysing the data and creating presentations.

Ethical considerations

Researchers may face several challenges while they observe participants in online environments. They become an invisible lurker as those online who communicated with the participant are not aware of their presence. Incidental data will be collected and cannot be secured for 'friends' of participants or random people who happen to navigate onto the page/site/network being studied. Should participants send a message to everyone on their email, IM, or Social Network contact list and let them know that they are partaking in this study and that if they are contacted by these people that they too may be recorded? This may be a critical step when observing through programs like Skype or Facebook where even faces and voices could be recorded. In such instances, should the recording be turned off to preserve ethics? Leander (2008) allowed participants to review and delete portions of the screen capture data that they did not want to share with the researchers. But it is unrealistic to contact everyone who falls into the incidental data.

Social relationships may be jeopardised or fall under the pressure of the research, if participants' friends realise that they are being observed. Friends may cease communication with the participant or only communicate with them at a superficial level.

Also, issues surrounding intellectual property rights may arise depending on what types of information was captured (US Department of Education, 2002). Does the researcher have the right to include in reports or show in presentations video footage that may include copyright material (Voithofer, 2005)? The capability of new technology to be able to store larger amounts of information at lower costs may tempt researchers to collect an abundance of data (Voithofer, 2005). However, including raw data such as video footage or full transcriptions in reports can further endanger the ethics of a study.

Looking forward

By considering the new democratic, participatory, and social web, my understanding of the relationship between the adult researcher and the participant has shifted. Advantages lie in equipping participants with the adequate tools to collect the data they deem relevant instead of the researcher choosing what data to collect. Putting video or still cameras in the hands of participants and allowing them to capture their surroundings or a particular phenomenon would give an insight into their perceptions and understanding of the world. It may, too, be interesting to ask the participants to come up with the interview questions and even to interview one another. Finally, it may make sense to include the names of participants as co-authors of a study for their contributions.

Conclusion

Internet research in the social sciences covers two main areas: 1) people's competencies to locate and retrieve information from data sources and 2) How the internet is used for communication purposes (Costigan, 1998). As social science researchers studying new technologies, we must consider our question first and understand how it is framed within the social sciences. Jones warns that "simply applying existing theories and methods to the study of Internet-related phenomena is not a satisfactory way to build our knowledge of the Internet as a social medium" (1999, x). It may be necessary then to build new theories, combine existing theories, or embrace multiple theories. Only at this point can we take the methodology under consideration and ask ourselves the following questions: How might traditional methodological tools be used in the study of online social behaviour and how might these traditional tools be altered to work in new "online social spaces"? (Leander, 2008, 33).

The current development in the social aspect of the internet already provides the level of interactivity and collaboration that partly resembles offline existence. Nevertheless, the differences in context as well as the attributes provided by the internet, such as anonymity, knowledge sharing, expanded scale, and global presence, imply a need for new research

methods; methods that will preclude the separation of the internet as a technology tool from the social context in which it is used. Participant observation with usability testing instruments can help answer questions in quantitative studies related to frequencies and patterns of internet use as well as questions in qualitative studies whose answers may help shed light on the nature of social interactions, the prerequisites, motives, and consequences.

The application of usability testing tools has the potential of collecting, analysing, and presenting dynamic data that was previously difficult to capture with more traditional tools. By pulling old materials in and creating the new, the internet is a bricolage. Researchers studying this medium will have to be bricoleurs, pulling from existing theories and methods to create new research paths.

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