

Evaluating the effective use of emerging technologies in education

Shailey Minocha

Centre for Research in Computing

The Open University, UK

Contact: s.minocha@open.ac.uk

Publications:

<http://oro.open.ac.uk/view/person/sm577.html>

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About this resource pack

The contents of this pack are as follows:

- tutorial description
- a toolbox of methods that educators, course designers and researchers can apply to evaluate the student experience with technology-enabled learning applications such as blogs, wikis, 3D virtual worlds (e.g. Second Life)
- Ethical considerations for conducting educational research

If you have any queries, feedback and comments, please contact Shailey.

About the tutorial

The aim of this tutorial is to present practical guidance for evaluating the effectiveness of educational initiatives involving social software and emerging technologies to support student learning and engagement. Examples of such initiatives are: inclusion of a blog in a course to encourage reflective learning, or having a wiki in a course for fostering team-working skills, or an activity in a 3D virtual world to enable students to learn through simulations, or the use of Delicious for bookmarking resources, or an App on a smartphone. 'Evaluation' implies investigating the usability, pedagogical effectiveness (does it meet the learning outcomes?), student experience, and impact on direct stakeholders such as educators and technical support staff (in terms of workload and support required).

Educators, practitioners and educational researchers will find this tutorial useful for learning about evaluating initiatives in a systematic manner and yet be able to choose research methods that are not very resource-intensive for themselves and for the participants (primarily students but other direct stakeholders too such as technical support staff).

Through examples of social software initiatives, we will discuss a number of data collection and data analysis methods in the tutorial ranging from traditional social science research (e.g. focus groups) to user-centred research methods (e.g. observations, diary studies) and to participatory design methods (e.g. experience sampling, student panels). We will also discuss about ethical considerations of conducting research, specifically, involving social software, where the personal and professional boundaries of user profiles (or identities) sometimes get blurred.

About Shailey

Dr. Shailey Minocha is a Reader in Computing in the Centre for Research in Computing at The Open University, UK. Shailey's recent research in e-learning has focused on how emerging technologies can support digital scholarship, for example, blogging and reflective practice; wikis and virtual team collaboration; 3D virtual worlds and training and skills development; and on the role of social media in research dialogues and research skills training and development. Shailey's paper 'An empirically grounded study on the effective use of social software in education' was the Highly Commended Award Winner at Emerald Literati Network Awards for Excellence, 2010. Shailey's research on the design of learning spaces in 3D virtual worlds 'Designing navigation and wayfinding in 3D virtual learning spaces' received the Gitte Lindgaard Award for best paper at OzCHI 2011. Shailey's LinkedIn profile is on: <http://www.linkedin.com/in/shaileyminocha> and her publications are listed on: <http://oro.open.ac.uk/view/person/sm577.html>

Techniques in educational research (toolbox)

Data collection and analysis techniques	Comments and sources
Pre-interview questionnaire (by email)	<ul style="list-style-type: none"> • The pre-interview questionnaire helps to gather preliminary information about the participant and the resources that would be useful to refer to before the interview takes place; these resources could be blog(s) addresses, websites, pointers to papers and books • The pre-interview questionnaire also helps to establish an early rapport with the participant • For an example, see page 88 of (Minocha, 2009)
Surveys (using SurveyMonkey.com)	<ul style="list-style-type: none"> • I view surveys as information collection mechanisms to get a broad perspective of the area of research; • Surveys can also help in recruiting participants (e.g. Minocha and Reeves, 2010 and Reeves and Minocha, 2010)
Open-ended questions (by email)	<ul style="list-style-type: none"> • After receiving the completed pre-interview questionnaire and before conducting a structured or semi-structured interview, we send two-three questions by email to the participant • The open-ended questions help to trigger thoughts and reflect on the experiences and, thereby, help the participant to prepare for the main interview (based on descriptive phenomenology, Langdridge, 2007). • The email interactions also help to establish rapport with the participant
Semi-structured interviews (on phone, via Skype, using instant messaging, within Second Life)	<ul style="list-style-type: none"> • We carry out semi-structured interviews after receiving the responses to pre-interview questionnaire and open-ended questions • In the interview template, we have questions and the probes; probes help the interviewer to re-word the main question or to delve deeper into the question • For an example, see pages 99-102 of (Minocha, 2009) • We conduct interviews by phone, Skype, within Second Life which is a 3D virtual world (e.g. Minocha and Reeves, 2010), or an instant messaging tool (e.g. Volda, et al., 2004)
Epistolary interviews (by email)	<ul style="list-style-type: none"> • When participants are not available for synchronous interviews or prefer asynchronous ways to communicate their views, we send the questions by email; sometimes a series of emails rather than sending a long list of questions which may overwhelm the participant (Debenham, 2007)
Reflective diaries (provided as Word documents)	<ul style="list-style-type: none"> • If we are observing the user behaviour and experiences over a period of time, we give reflective diaries to students (Schon, 1983; Ghosh, 2003) • A reflective diary consists of questions at different stages over which the user experiences are captured over a period of time (Johns, 1994)
Reflective questions (within assessment)	<ul style="list-style-type: none"> • We also include reflective questions – asking students to reflect on their experiences as a part of the assessment (Minocha and Thomas, 2008)
Focus groups or group interviews (face-to-face, or in Second Life)	<ul style="list-style-type: none"> • We conduct focus groups or group interviews when a broad perspective of the research area is required before one-to-one interviews are carried out • We also conduct group-interviews as a way to establish early rapport with the participants • Focus groups also help in clarifying and refining the research questions
Case study methodology	<ul style="list-style-type: none"> • Where a comprehensive study of an initiative involving several stakeholders has to be carried out, we employ case study methodology e.g. pages 16-19 of (Minocha, 2009); (Schroeder et al. 2010).
Thematic analysis	<ul style="list-style-type: none"> • This is a data analysis technique which we use for extracting the themes or key concepts from the data and we are guided by the research questions (e.g. Minocha and Reeves, 2010; Braun and Clarke, 2006)
Analysis of the blogs	<ul style="list-style-type: none"> • Discourse analysis (e.g. Wetherell, 2001a and 2001b)

References

- Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, vol. 3 no. 2, pp. 77-101.
- Debenham, M. (2007). Epistolary Interviews On-line: A Novel Addition to the Researcher's Palette, http://www.jisctechdis.ac.uk/assets/Documents/learnersmatter/Epistolary_Interviews_On-line.pdf (accessed 9 July 2012).
- Ghosh, S. (2003) "Triggering Creativity in Science and Engineering: Reflection as a Catalyst", *Journal of Intelligent and Robotic Systems*, Volume 38, Nos. 3-4, pp. 255-275.
- Johns, C. (1994) "Nuances of reflection", *Journal of Clinical Nursing*, vol. 3, pp. 71-75.
- Langdridge, D. (2007). *Phenomenological Psychology: Theory, Research and Method*. England: Pearson Education Limited.
- Minocha, S. (2009). A study of the effective use of social software to support student learning and engagement. JISC, University of Bristol., <http://www.jisc.ac.uk/whatwedo/projects/socialsoftware08.aspx> (accessed 9 July 2012)
- Minocha, S. and Reeves, A. J. (2010). Interaction design and usability of learning spaces in 3D multi-user virtual worlds. In: Katre, Dinesh; Orngreen, Rikke; Yammiyavar, Pradeep and Clemmensen, Torkil eds. *Human Work Interaction Design: Usability in Social, Cultural and Organizational Contexts*. IFIP Advances in Information and Communication Technology. Springer, pp. 157-167.
- Reeves, A. J. and Minocha, S. (2010). Relating pedagogical and learning space designs in Second Life. In: Cheney, Amelia and Sanders, Robert eds. *Teaching and Learning in 3D Immersive Worlds: Pedagogical Models and Constructivist Approaches*. USA: IGI Global, In Press.
- Schon, D. (1983) *The Reflective Practitioner – How Professionals Think in Action*, London, Temple Smith.
- Schroeder, A., Minocha, S. and Schneider, C. (2010). The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning*, 26(3), pp. 159-174.
- Voida, A., Mynatt, E. D., Erickson, T. and Kellogg, W. A. (2004). Interviewing Over Instant Messaging. *Proceedings of the Conference on Human Factors in computing systems, CHI'04 extended abstracts*, New York: ACM Press, pp. 1344-1347.
- Wetherell, M., Taylor, S. and Yates, S.J. (2001a) *Discourse Theory and Practice: A Reader*, London: Sage/The Open University.
- Wetherell, M., Taylor, S. and Yates, S.J. (2001b) *Discourse as Data: A Guide for Analysis*, London: Sage/The Open University.

Ethical considerations

Establishing trust with the participants is important in a research study. Trust is closely linked to a participant's perception of privacy. If a participant feels that their answers are likely to risk their privacy they will not complete the research or distort their responses.

Participants also need assurances of confidentiality – details of how the information is going to be stored and who will access it. Of key concern is how identifiable the information is. If the information is held anonymously, then it will be re-assuring for the participants. So it is helpful to emphasise to the participants that the information that they provide will be anonymised. Sometimes disclosing the number of the participants who are involved in a study also helps to increase their perceptions of anonymity.

The concern for privacy and anonymity will be of particular concern if you are conducting evaluations of a system or initiative within your own organisation (e.g. with other educators). Your colleagues may have valid concerns that their performance during evaluations may affect their reputation or credibility and may even shown them poorly in front of their superiors.

Informed consent: Project summary sheet and consent form

To build up this trust with the participants, it is useful to take an informed consent from the participants at the recruitment stage. Even if you are recruiting participants through an agency, it is useful to provide as much as information upfront through the agency. In fact, in one of the interviews with a usability experience manager which I conducted recently, she mentioned that they stopped doing business with a recruitment agency as the agency was not providing enough information to the participants upfront – so the participants were somewhat taken by surprise when they came for the usability session.

We create a project summary sheet to provide information about the evaluations and to create an initial trust with the participants. Please see *Appendix 1* for a sample.

The *project summary sheet* has the following information: who we are? what is the project about?, how will the session(s) be carried out, time it will involve? So if the study involves two or three stages such as pre-interview questionnaire, an interview and a de-briefing session – we outline the stages and also mention at which stages the audio and video recordings will be done. We mention who would have access to the data?, what we will do with the information that we collect: where we will store the data and for how long, what are the end products of the study – papers, articles or reports; we also mention that there is an accompanying consent form and they have the right to withdraw from the study; and finally we provide them with full contact information of the project leader so that they can contact us at any point during the study.

The notion of informed consent is that the participants must understand the reason for conducting the study so that they can make a meaningful decision as to whether or not they wish to participate. The project summary sheet provides this information.

The second part is the '*consent*': participation should be voluntary and free from any coercion. Potential participants should not be given the reason to believe that a decision not to participate will lead to any repercussions or disapproval. In the consent form, we again mention the title of the project and that they are agreeing to be audio and video recorded and observed (depending upon the usability session that has been planned), the anonymity of their information will be maintained and the copyrights of any publications or reports will belong to the organisation or to the publisher; and most importantly that they have the right to withdraw at any point. Please see *Appendix 2* for a sample consent form.

Even if the participant has given the consent, it is again useful to reiterate about the setting of the session: about the recording, who will be observing, how the session will be carried out and giving them the option to stop and take a break at any point.

Giving incentives to participants

Talking to colleagues, I have noted that there are different practices in different organisations – for example, some tend to give the participants incentives at the start of the session or the study if the study involves several stages and some give the incentives at the end of the session or study. Actually, the general guidance, especially in our university is that incentives should only be given to cover expenses or inconvenience otherwise it can be perceived as coercion or inducement to participate. If we are conducting remote evaluations where travel expenses have not been incurred, we send book tokens to our participants and not give cash. But in the industry, I have noted that giving cash incentives is the norm.

Although almost all codes of conduct for ethics state that giving incentives can create a bias in sampling or participant's responses, but at the start of the session if the moderator mentions how significant their participation is in improving the usability and learnability of the product/service, participants tend to focus on the task in hand and are very forthcoming with their feedback and thoughts. So the moderator or facilitator's role is key in establishing trust for the participants, giving them assurance and highlighting the significance of their participation. If the participant turns up, but for some reason is unable to participate or withdraws from the study, the norm is that you still offer the incentives.

Web-based resources for ethical considerations

AOIR. Ethical decision-making and Internet research: recommendations from the AOIR ethics working committee, 2002 Available from:

<http://www.aoir.org/reports/ethics.pdf>, accessed 9 July 2012.

Code of Conduct for Usability Professionals,

http://www.upassoc.org/about_upa/leadership/code_of_conduct.html, accessed 9 July 2012.

Sample consent form, <http://www.sensible.com/rocketsurgery/index.html>, accessed 9 July 2012.

Code of Ethics and Conduct, British Psychological Society,

http://www.bps.org.uk/the-society/code-of-conduct/code-of-conduct_home.cfm, accessed 9 July 2012.

Managing Ethics in Research, <http://www.ucc.ie/academic/apsych/ethics/>, accessed 9 July 2012.

Research Ethics at the Open University,

<http://www.open.ac.uk/research/ethics/index.shtml>, accessed 9 July 2012.

Ethics and Educational Research, <http://www.bera.ac.uk/resources/ethics-and-educational-research>, British Educational Research Association, accessed 9 July 2012.

Statement of Ethical practice,

<http://www.britsoc.co.uk/equality/Statement+Ethical+Practice.htm>, British Sociological Association, accessed 9 July 2012.

Minocha, S. and Tzanidou, E. (2010). Ethics in usability engineering. In: India HCI 2010/Interaction Design for International Development, 20-24 March 2010, Industrial Design Centre, Indian Institute of Technology, Bombay, Mumbai, India.

<http://oro.open.ac.uk/21288/>, accessed 9 July 2012.

Appendix 1: Sample project summary sheet

The Role of the Educator in a Social Software Initiative

We hope this leaflet will answer the questions you might have about participating in our study.

Who are we?

We are a team of researchers at the Open University, UK, and in the Faculty of Maths, Computing and Technology. The Project team consists of Dr. Shailey Minocha (Principle investigator and Reader in Computing) and Dr. XXXX (research fellow).

What do we want to know?

We are investigating the role of social software in education and the resulting impact on the role of an educator. We would like to know about the range of activities which are involved in the use of social software in an educational setting and your related experiences. We would really value your experience on this and hope you will agree to participate in the study.

What will it involve?

Your involvement would include three steps:

1. We would first like to send you a short email-based question where we enquire about your experiences of using social software. Answering this question should not take more than 20 minutes and you could return your response by email.
2. We would then conduct a face-to-face interview where we would focus on specific aspects of your social software initiative. This interview will take no longer than 45 minutes and will be audio recorded.
3. Following the interview we would provide you with a short email-based validation activity to verify our understanding of your role in the social software initiative.

If you decide to participate you will be asked to sign a consent form. We have received the appropriate ethics permission to conduct the study from the University's Research Ethics Committee. You maintain the right to withdraw from the study at any time. Upon your withdrawal from the study all data collected from you will be deleted and will not be further used in the research.

What will we do with the information we collect?

We will produce case studies and scientific publications based on the information we can collect during interviews. We aim to produce results which help other people to learn from your experiences.

We will keep all of the information – recordings, notes and picture – secure and as per the Data Protection Act. Only members of the team will have access to this material. We would request you not to provide us with any information which might force us to inform others and breach confidentiality.

We may use anonymous quotes from the recordings as highlights in the case. We will send you copies of the material so that you know what will be published.

How can you contact us?

If you have any other queries about this study, please email or call Dr. Shailey Minocha at s.minocha<at>open.ac.uk, XXXXX (office), XXXXX (mobile).

We look forward to hearing your experiences. Thank you for taking the time to read this project summary sheet.

Appendix 2: Sample consent form

Role of the Educator in a Social Software Initiative

I, the undersigned, consent to participate in the study on 'the role of the educator in a social software initiative' as outlined in the project summary provided.

I consent to the use of my words being used within a scientific publication or report. I understand that this will be used for academic and research purposes only and that copyright will reside with the Open University, UK or the respective outlet of the research publication in print or on the Web.

The data collected from me and my personal details will not be made available to third parties.

Please complete and return the form to Dr. Shailey Minocha, either by email or by post.

Email: s.minocha<at>open.ac.uk

Postal address: Department of Computing, The Open University, Walton Hall, Milton Keynes, MK7 6AA

Participant's details

NAME

ADDRESS

Signature

Date

Attached: Project Summary Sheet