

EDITORIAL INTRODUCTION

There is a possibly apocryphal story concerning modern fighter aircraft pilots who can chose to fly 'blind' using their head up displays or 'sighted' using direct observation. The story is that almost all prefer combat 'blind', in a sort of virtual world, and its moral is obvious. Whatever we may think, there are some activities that are best performed in a virtual world rather than a real one. In education there are many examples of settings in which students might benefit from working virtually. Often it is possible to set up exercises in virtual worlds that would not be possible in the real one by reason of time, access and cost. Virtual worlds can easily be revisited to enable learning by repetition ('drill and practice'). Since we often learn, not by doing something correctly, but by our mistakes, virtual worlds enable errors that in the real world would be serious to be made without penalty and, as we often say 'put down to experience'.

These and similar considerations led Ralph Schroeder & Ray Lee to develop the exercise they describe in the following paper. In this, they used a multi-user virtual world as a source of 'virtual' interview respondents for advanced students undertaking training in social survey research. In the comparative 'safety' of this virtual world, students were able to undertake either a structured interview or a formal questionnaire intended to uncover as much as possible about the person/avatar in the virtual world. This work raises educational, ethical and technical questions and these are discussed in full.

Social science students aren't fighter pilots, but it is clear that the available technology provides numerous opportunities for simulations of real 'research' in the comparative safety of the computer laboratory.

Multi-User Virtual Reality Technology as a Laboratory for Learning about Social Research: Issues and Prospects

Ralph Schroeder & Ray Lee

*Department of Social Policy and Social Science
Royal Holloway – University of London
Egham, Surrey TW20 OEX*

Email: r.m.lee@rhbnc.ac.uk
Schroeder@mot.chalmers.se

Abstract

This paper describes a project to use multi-user virtual reality (VR) in teaching about social research. It begins by pointing to some of the problems in current research methods teaching and to some of the more general problems encountered in field research. Next it describes how simulations have been used to address some of these problems, what multi-user VR is, and how it might be used in teaching. At this stage the essay gives an account of the teaching sessions that were carried for this project, as well as of a separate participant observation study – and assesses the usefulness and benefits of this type of teaching and research. It also reports on a further part of the project which dealt with data capture about virtual populations and discusses some of additional tools that may be required for this. And since a number of ethical issues were raised in the course of this research, these are discussed at some length. We conclude that although much further investigation about using multi-user VR as a teaching tool is needed, this technology offers a host of possibilities that may fundamentally change the nature of social science teaching and research.

1. Gaining Practical Research Experience in Learning about Research Methods.

An increasing focus on formal research methods training has formed an important element in recent ESRC policy in the United Kingdom. Yet the form, content and pedagogy of research methods teaching in the social sciences remain somewhat contentious (see e.g. Bechhofer, 1996). As Eliot Eisner has pointed out it is important to develop encounters or learning activities which are “planned to provide the student with an opportunity to personalize learning” (1985, 69). On research methods courses most teachers provide such opportunities by putting students into some kind of explicit research context (Schutt *et al.*, 1982, 233). Often this context involves students undertaking some actual research, either on an individual or a group basis. An alternative, and arguably superior approach, is to simulate features of the research process (Lee, 1987).

2. Problems in Field Research

Field research by its very nature requires people to carry out tasks which run against the grain of earlier socialization and social experience (Sanders, 1980). Thus, it is difficult to

avoid the fear of being a stranger, the fear of rejection when seeking personal details about people's lives, and the fear of violating the normative standards of those being studied. It is hardly surprising, then, to learn that fieldworkers on occasion exhibit physiological symptoms associated with stress such as diarrhoea, nosebleeds and vomiting (Lee, 1993.) Against this, one can sometimes find a degree of over-enthusiasm to gather data that has led students to engage in rash, not to say dangerous, behaviour in the field (Lee, 1995). Perhaps not surprisingly, then, much writing on ethnographic research tends to see entry to the field as a rite of passage. This has tended to encourage a view that field research methods cannot and, perhaps, should not be taught.

None of the students who undertook an extended period of 'fieldwork' in a virtual field had yet entered the field in their own research projects. It is clear that engaging with the research subjects in the virtual world helped students to avoid some of the anxieties that are often confronted by those gathering data for the first time. Furthermore, reporting on their experiences allowed them to reflect on the roles they had adopted in the virtual world and how these might be different from those they would probably encounter on entering the research site chosen for their thesis. This kind of anticipatory socialisation is extremely difficult for students to gain outside of an actual project where, of course, the costs of failure are much higher. Students also noticed that many questions could be raised about the claims to status and identity in the virtual world and that this could have important implications for the 'comfort' both of themselves and those they engaged with while in the virtual world. Such experience leads easily to an appreciation of how socially generated trust facilitates access in a research environment. In addition, the ability to log data allows their 'fieldwork' to be discussed with a supervisor in a way that is simply not possible in real-life where the presence of a third party is likely to affect the character of the interaction. This has important and positive implications for research methods training.

3. Using Simulations in Research Methods Teaching

Simulations are ideally suited to teaching about complex, indeterminate processes that place within the context of an overall strategy. Simulations are essentially models that abstract from a complex reality. They allow to be made explicit the interrelationships within some system and the interplay of the elements that make up that system. Importantly, in teaching contexts simulations require students to make real-life decisions, but without real-life consequences other than those associated with learning. Moreover, simulations can be re-run, allowing students to learn from their mistakes. In teaching research methods, therefore, it seems sensible to present students with a simulated research environment and to ask them to make decisions about how to proceed in terms of their overall research goals, in relation to the various constraints presumed to operate in the situation and in the light of various contingencies that are presented to them. This done, the likely consequences in research terms of the decisions they make can be fed back to them, and the simulation re-run if necessary on the basis of different decision. Students can then be de-briefed collectively in ways that ensure that their experiences are related one to another, to the methodological literature and to substantive studies.

4. Using Virtual Reality in Research Methods Teaching

Pantelidis (1996) suggests that virtual reality is a potential candidate for use wherever one might use a teaching simulation. Networked virtual reality (VR) provides what Dede (1996) calls an "emerging representational container" capable of enhancing "sophisticated types of instructional applications", by virtue of their immersive, fluid and distributed character. The term 'Immersive VR' is used here to refer to a computer-generated display

which gives users a sense of being present in an environment other than that they are actually in and to interact with that environment (see Schroeder, 1996, 25). 'Desktop VR' systems only display the virtual environment on a 2-D desktop computer screen. Such systems do not therefore permit the kind of immersion experienced with head-mounted displays and other input/output devices like gloves or hand-held 3D joysticks. However, like immersive VR, they provide a first-person perspective on a 3-D computer-generated world. Finally, 'second-person VR' systems represent the user as an avatar (or figure) on the screen without a first person perspective.

5. Multi-User VR Systems

Multi-user VR systems have a number of sociologically interesting features. Typically, such systems borrow extensively from other technologies and formats, particularly text-based MUDs and computer games. The same applies to the behaviours of users, who often display traits found in other forms of electronically mediated communication such as aggressive verbal exchanges. There is evidence to suggest, however, that users are much more involved in VR worlds than in text-based MUDs or in 2-D worlds with limited interaction. Moreover, aspects of social differentiation, stratification and spatial concentration can be found in VR worlds (Schroeder, 1997). So far there is relatively little known about social interaction in high-end fully immersive VR systems. They have been used mainly for short periods, over local area networks and for demonstration or proof-of-concept purposes. With the recent take-off in the number of domestic Internet users, desktop and second-person systems have been widely available via the Internet, mainly for entertainment. However, limited bandwidth means that at present it is only possible to exchange text messages and to represent avatars in a two- and latterly simple three-dimensional world.

6. Multi-user VR Research Methods Teaching Session

The research methods teaching sessions included students from one post-graduate research method course and one post-graduate course on information technology for social scientists. Ten students, four from one group and six from the other, took part in the exercise. This consisted of two tasks which involved interviewing users of the multi-user VR system Activeworlds (for images of these worlds, see Schroeder, 1997: 5, fig.2 available online at <<http://www.socresonline.org.uk/socresonline/2/4/5.html>>). For the first interview, students were asked to find out 'as much as you can about the social characteristics of the user "behind" the avatar through casual conversation'. For the second interview, students were asked to carry out a structured interview about the background of the user and about their use of Activeworlds and computing generally (5 questions each).

The sessions lasted approximately two hours. Each session included a brief introduction to the use of the system as well as the variable amount of time it took for students to write down the material they gathered. After both interviews were completed, students were asked to assess the usefulness of the teaching session. To do this, they filled out a questionnaire with questions about the difficulty of the interviews, about access, and about the advantages and disadvantages of studying virtual people as opposed to real ones.

7. Assessment of the Usefulness of the Teaching Session

The main results of this assessment are as follows. One difficulty which several students encountered was an inability to find a subject to talk to or interview. In the case of one student, this meant that he was unable to complete the second interview. Several other

students felt that it was frustrating to find subjects, but almost all managed after a short time. The problem that it may take time to find a suitable subject could have been overcome by allowing for more time than the allocated 30-45 minutes per interview.

There was also a mixed response in terms of whether the students preferred the 'casual conversation' or structured interviewing. Some found it easier to engage in a friendly conversation and thought they could learn more about the avatar/user in this way. Others felt that asking set questions made the interview easier since they could elicit little information through casual conversation. This latter problem, again, could be solved through allowing more time since, as we shall see below, getting a 'feel' for the users of virtual worlds becomes easy when the researcher has had a chance to become acclimatized to the setting.

Several students observed that some avatars/users were coy or unforthcoming about answering questions. When a willing and forthcoming subject was found, however, (and this is the majority of cases), students expressed surprise about how easy it was to ask questions and how much users/avatars were willing to reveal about themselves. Hence, it was felt that the main advantage of studying virtual subjects as opposed to real ones was that it was easy to gain access, to feel comfortable in asking questions, and to elicit responses (including answers to questions that subjects might not be willing to reveal in face-to-face interviews). The main disadvantage was that it was impossible to know whether the subject was being truthful and also that the lack of face-to-face contact did not allow for getting a real 'sense' of the subject.

Other drawbacks that were mentioned were that conversations in Activeworlds could sometimes be uninhibited to the point of being offensive, that it was sometimes difficult to isolate users from other users to carry out the conversation/interview, and that some groups were quite close knit and therefore excluded a newcomer or researcher. Other advantages mentioned were the absence of preconceptions about the researcher or the subject and the details that subjects were willing to reveal about themselves and the candour with which they did so.

8. Multi-User VR Participant Observation Study

A second part of the project was that three social science students (one undergraduate, two postgraduate) carried out participant observation studies of Activeworlds. They spent more than 10 hours each in this multi-user world and wrote brief reports about their research (it should be mentioned that they were reimbursed for their time). None of these students mentioned difficulties of access to the population (although the 'insider' jargon could be difficult on occasion) and all the reports provided rich insights into the social rules, roles and degrees of cohesion of various worlds.

As in the research methods teaching session, the problem of the truthfulness of responses was raised. But it was also clear that users were willing to reveal much more about themselves than they would in face-to-face conversations, and this could be a significant advantage for research. The most striking feature of the reports, however, is the degree of insight that could be gained into the workings of the virtual worlds within a relatively short period of time. The main reason for this is perhaps that virtual worlds are relatively uncomplicated: the modes of communication and social interaction as well as the size and degree of complexity of these virtual worlds are closely circumscribed.

There was no separate assessment of the usefulness of participant observation in this case since this part of the project consisted of independent research rather than being part of a taught course. Nevertheless, in the light of the insightful reports that were generated, it can be suggested that similar lessons apply to this part of the project: namely, that the non-threatening nature of the environment and the ease of eliciting information provides a good

testing ground for practising how to do research using participant observation.

9. Benefits of using Multi-User VR in Teaching

The benefits of using multi-user VR in teaching social research are therefore that

- Students are able to get experience in interviewing subjects in an unthreatening setting.
- They are able to gain access to information that they would find difficult to gain access to in real-world settings.
- With participant observation of approximately ten hours, it is relatively easy to gain insight into the social rules and the differences between groups and worlds. This is because the virtual world is in many ways less complex and more 'accessible' than the real world.
- Some of the problems that are encountered in virtual worlds, such as the difficulty of gauging the veracity of answers, or the difference between informal conversation and structured interviews, are useful for 'sensitizing' research methods students to some of the difficulties in research and allow these to be learnt with a minimum of effort.

Areas where multi-user VR will not be useful is in research in which the researcher needs to get a 'feel' for the subject and his or her context, as well as in research where the veracity of results - or the difficulties in a real fieldwork setting - is important. An obvious disadvantage of using this method of teaching is that students will not become aware of the complexities and difficulties to be encountered in real world interviewing and participant observation. These issues could also lend themselves to interesting discussions for students about the relation between 'virtual' and 'real' fieldwork.

The findings of this project are exploratory in so far as the teaching and research consisted of small groups and brief sessions. Yet in the light of the promising results, it can be suggested that this project points to an overall positive balance of benefits of using multi-user VR. What is needed now are more systematic comparisons as to the benefits of teaching and participant observation using multi-user VR as against using conventional methods for teaching and research.

10. Data Capture about Virtual Populations

It was envisaged that the teaching session would include data capture of population movement in the virtual world - such as numbers of users in different world. This proved impossible, first, because it would have taken too long (students had just enough time to carry out interviews and performing additional tasks would have at least doubled the time of the session) and second, because the programming for this task was more difficult than expected. Nevertheless, this part of the project was carried out separately and involved capturing information about the population in Activeworlds over the course of one week. These data were captured at five-minute intervals and includes the number of users per world as well as the total number of users. Data for the number of users active in Activeworlds and in 'The Gate' over a 24-hour cycle show definite patterns or regularities. The 'ebbs and flows' of virtual populations are fairly similar on any weekday, and this is especially noteworthy since the population of users comes from all over the world

These data can therefore also be used for introducing students to issues concerning sampling. At present, when students on social research methods courses are introduced to sampling issues, it is usually assumed (though this is often not clear) that what is being discussed is area sampling, of the kind typically used for population surveys. On the Internet, however, one is typically more interested in flows of users onto and off a particular site. As

Internet methodologies become more common in disciplines like sociology, teaching about appropriate flow sampling methods will become important. Such issues do not usually at present form part of the social science curriculum. Put differently, exposure to data of the kind that we have captured about a virtual population will allow students to appreciate the differences between area and flow sampling.

Gathering this type of information will be useful not only in teaching about social research, but also for the social scientific study of multi-user virtual worlds. A key issue that must be taken into account in the design of these tools are the ethics of gathering data about online behaviour. There has been some discussion of this issue for text-only worlds, but graphical worlds also pose some distinctive issues (see below). This is also an area where new software tools might help researchers and teachers. For our purposes, it was possible to use 'frame-grabbing' software and software for arriving at the total numbers of users. Such tools could, however, be developed for wider use among researchers and they could also be designed to include additional functionalities (tracking the number of encounters between avatars and their movements within and between different worlds). Again, the ethical issues of gathering this type of data remain to be resolved.

11. Ethical Issues

Since the ethical issues involved in studying virtual worlds have been mentioned on several occasions, these issues deserve to be discussed at greater length: an important aspect of ethical conduct in research is the principle that research participants should be treated with respect and as autonomous agents (National Commission for the Protection of Human Subjects, 1978). From this flows the requirement for obtaining informed consent from research participants. Students who participated in the project did so on the basis of fully informed consent about the purposes and procedures of the study. It should be clear that, although most questioning was overt, in some cases those encountered by students in the virtual world were unaware of the purpose behind the questions being asked of them. We think, though, that as it was constituted the experiment did not raise major ethical difficulties. The questions asked were innocuous and of a kind frequently employed at the beginning of on-line conversations. Moreover, participants in a virtual world have a repertoire of actions for signalling when they do not want to maintain contact.

A second principle of ethical conduct in research is that no harm should come to research subjects as a consequence of their participation in a research project. Flowing from this principle is a concern for the privacy of research participants. Issues of privacy arise when personal information gathered for research purposes can be tied to a specific individual. (Aggregated information, e.g. about the number of users in a particular world at a particular time poses no threat to privacy.) In fact, little threat exists to the privacy of those individuals interviewed by students. Since users are represented in multi-user VR by avatars and refer to themselves by aliases, identifiable data are not available. In theory, some identifiable information is available to systems operators but interlocutors only have information that is volunteered to them.

The design of the experiment provided further protection to users: threats to privacy come into being through dissemination of research data. In this study, the primary interest was the behaviour of the students rather than other users. As a result, no use was made of the information they gathered from other participants in the world they visited. Nevertheless, it is generally considered undesirable to put students, especially undergraduates, into situations of potential ethical difficulty (Lee, 1987).

Potential ethical difficulties, together with the problem that some students had to wait to find someone with whom they could interact, suggest that it might be appropriate in the

future to modify the sort of procedures used here. In particular, the teaching session could be held in an 'empty world' and participation could then be restricted in the research exercise to class members, each of whom would be assigned an 'identity' and a set of social attributes that had been generated factorially. The aim of the exercise would be for students to elicit through interviews as many attributes of the others in the world as they can. The added benefit here is that in debriefing, the data gathered could be measured against the characteristics previously assigned. Such an approach might also alleviate a further possible problem that has been found in MUDs or MOOs. Popular sites increasingly attract the attention of researchers in ways that alter the character of the site. In consequence, that which was initially of interest is destroyed. A further consequence is that participants in virtual worlds can increasingly become irritated by the presence of researchers and distrustful of them. We emphasise we have no evidence that anything like this was generated by our experiment. Indeed our student ethnographers were welcomed and helped as much as they could about the world they visited. Nevertheless, we suggest there is a need to move forward with caution.

12. Conclusion and Outlook

This project has demonstrated the feasibility of using multi-user VR in teaching social science research methods. It has also suggested a number of unanticipated further uses of this technology in teaching and research, and identified ethical and research issues that need to be addressed. Much refinement of these teaching methods and of the tools for studying the populations of virtual worlds will be needed. But, as the trend towards the increasing use of networked computer graphics and immersive VR continues, so, too, does the potential for teaching and research related to this technology: remote interviewing, focus groups, participant observation and data capture on virtual populations - in short, computer-mediated research of all kinds. The prospect for developing fully global systems of data collection and for the study of subjects in the setting of virtual worlds opens up a host of possibilities which could fundamentally change the nature of social science teaching and research. This project has only begun to explore these possibilities in what may become a vast and exciting laboratory for social research.

13. Acknowledgement

We would like to thank Jonathan Howell of the Department of Computer Science Department at University College London for his sterling work on this project, and Anne Mumford for her help and patience in advising the project.

14. References

- Bechhofer, Frank. (1996) 'Quantitative research in British sociology: Has it changed since 1981?', *Sociology*, 30: 583-91.
- Dede, Chris (1996) 'The evolution of constructivist learning environments: immersion in distributed, virtual worlds', *Educational Technology*, 35: 46-52.
- Eisner, Elliot (1985) *The Art of Educational Evaluation: A Personal View*. Lewes: Falmer.
- Lee, Raymond M. (1987) 'Problems in field research: some simple teaching techniques', *Teaching Sociology*, 15 (2): 151-6.
- Lee, Raymond M. (1993) *Doing Research on Sensitive Topics*. London: Sage.
- Lee, Raymond M. (1995) *Dangerous Fieldwork*. Thousand Oaks, CA: Sage.
- National Commission for the Protection of Human Subjects (1978) *Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. (The Belmont Report). Washington, DC: US Government Printing Office.

- Pantelidis, Veronica S. (1996) 'Suggestions on when to use and when not to use Virtual Reality in education', *VR in the Schools*, 2 (1): <http://eastnet.educ.ecu.edu/vr/vr2-1.htm>
- Sanders, Clinton R. 1980 'Rope burns: impediments to the achievement of basic comfort early in the field research experience' in William B. Shaffir, Robert A. Stebbins and Alan Turowetz, *Fieldwork Experience: Qualitative Approaches to Social Research*. New York: St Martin's Press.
- Schoeder, Ralph (1997) 'Networked worlds: social aspects of Multi-User Virtual Reality Technology', *Sociological Research Online*, 2:<<http://www.socresonline.org.uk/socresonline/2/4/5.html>>
- Schroeder, Ralph (1996) *Possible Worlds: The Social Dynamic of Virtual Reality Technology*. Boulder, CO: Westview.
- Schutt, Russell K., Alan Orenstein and Theodore C. Wagenaar (1982) *Research Methods Courses: Syllabi, Assignments and Projects*. Washington DC: American Sociological Association.