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Evaluating a collaborative online learning environment

Abstract

Computer conferencing is used in a number of educational institutions to add openness and flexibility to courses taught on campus. This paper argues for the use of ethnographic techniques to evaluate this type of provision. The research reported is an attempt to develop an adequate understanding of group work as it occurs on-line.

Examples are taken from the research to indicate how ethnographic techniques can be used to inform the design and use of groupware systems in education. In particular ethnography stresses *context* and refuses to use a priori categories or concentrate exclusively on the *learning process*.

Computer conferencing and ethnography

Computer conferencing even when merged with web technologies remains small scale¹ and qualitative research has been advocated for research in this area². In educational research more generally the ethnographic approach is well represented and has been used to provide the basis for evaluation^{3,4,5}. Ethnography has recently been employed to study computer conferencing used for distance education in the United States⁶. Ethnography may be appropriate for group applications because it starts from the proposition that human activities are socially organised. The method relies on understanding the setting from the point of view of those involved in it. Ethnography is an intrinsically descriptive task that resists formalisation. The methods rely on the study of people and their activities in their natural environment^{7,8}.

Ethnography has emerged as a key methodological insight in the developing field of Computer Supported Cooperative Work (CSCW). CSCW is an interdisciplinary field that concerns itself with the collaborative and social aspects of work. It is the concern with the social properties of the work setting that have suggested the appropriateness of ethnographic methods. In CSCW the form of ethnography adopted has been heavily influenced by ethnomethodology^{9,10,11}. Ethnomethodologically informed ethnography is distinct in its critique of theory and theorising¹². It is distinguished from classic sociology and ethnography in treating the social facts studied as practical accomplishments. It is precisely those areas that are taken for granted by sociological analysis that are of interest. How students and tutors constitute the facts of collaborative education becomes the topic for study rather than the facts themselves. Recently this approach has been explicitly developed for the purposes of evaluation of CSCW systems, in particular to investigate the slow take up of such systems¹³.

Approaches to evaluation

Reviews of evaluation procedures have dealt with a variety of techniques¹⁴. A particular case has been made for attention to be placed on the transcript of conference interactions using content analysis^{15,16}. Content analysis involves the analysis and categorisation of messages according to basic types. It rests on generating a typology of messages allowing a quantitative analysis of activity. In applying content analysis Henri focused on a single aspect of computer mediated communication (CMC);

“An attempt to analyse all dimensions of CMC would have led to the collection of an abundance of data and information, much of it irrelevant to the learning process.” (16 p123)

It may be that what appears irrelevant to an outsider is of significance to an insider, that education and learning consists as much of ordinary behaviour (e.g. casual chatting, ad hoc arrangements to meet, etc.) as it does of elements of a learning process. The ethnographic emphasis is on the accomplishment of education within an abundance of apparently irrelevant and complex data, to describe in some detail just what education consists of.

Transcripts

The written transcript is a document that points towards but does not entirely capture the ongoing social event that the conference is for its participants. The transcript is something of a hybrid between writing and conversation, a form of written interaction¹⁷. Recently some authors have applied conversation analytic (CA) approaches to computer conferencing^{18,19}. CA has been applied to computer conferencing in a way that assumes the transcript to be unproblematically *conversation*.

“An excerpt of the transcript is given below. It is this 'verbatim on-line conversation' which is the main subject of our analysis, using essentially the methodology of conversation analysis.”¹⁸

I would dispute this uncritical adoption of transcript as in some way simple conversation.

Collaborative work takes place in a mutually constitutive way between on-line and off-line working²⁰. The work on-line produces a document pointing towards the conference rather than preserving the conference itself. Because of this tutors and researchers must beware of believing that the transcript is in some simple way a record of the conference. A practical implication is that the transcript is not adequate alone for evaluation purposes. Equally the work off-line points to the conference but is not a context that can be added to the transcript in order to explain what takes place within the conference boundary. The actions by staff and students off-line inform their activity on-line. The weakness of the transcript cannot therefore be corrected by simply adding more context. The problem is one of understanding the orientations of the participants²¹.

The transcript records only those activities that are entered into the conference software. It is in this way a partial record. Reliance on the transcript would ignore these activities outside the conferencing system. The suggestions that the transcript can be utilised by researchers, the moderators of conferences and the wider educational institution to evaluate teaching would alter the perceptions and actions of the participants. The transcription record highlights the sense of day to day accountability. A sense of surveillance was a feature I observed in reaction to tutors having access to a record of students interactions. The behaviour recorded became public conduct in consequence and subject to the known aspects of *performance*²². At times some users seemed almost perverse and certainly ingenious in their ability to discover ways to (mis)use conference software. Ethnography can help elucidate the participants perspective and help complete the partial picture given by transcript alone.

The research

From 1994 I was a research student at Manchester Metropolitan University observing Technology and Communication (TiC), a second year unit on the IT and Society degree, taught almost entirely on-line using FirstClass. FirstClass is one of the most popular computer conferencing systems in Higher Education. It is a proprietary electronic mail, bulletin board and conferencing system which uses a graphical user interface. FirstClass is a client server application and the versions used did not include any off-line working. FirstClass supported both Windows and Macintosh clients and was available on part of the university networks and through direct dial-in. The use of the system was extended in 1995/6 to cover course units across the degree. A modified version of the course is taught currently and is due to migrate to the FirstClass Intranet Server which will add web access to the system.

As a research student I observed the course without any ownership or commitment to the details of pedagogy or technology. This *indifference* is characteristic of ethnographic research. Ethnographic methods involved collecting data from a wide variety of sources including; paper and electronic records of the conference transcript; observations in computer laboratories, classrooms, corridors and various social situations, and interviews. I had access to staff and became accepted, privy to everyday comment and gossip. Equally amongst students I was given a status little different to those I observed. I took care to appear on the conferencing system but not to intrude. This meant a restriction on where and when to post messages. I took no part in work conferences and didn't enter messages into course areas. Where "Chat" areas were set up I used them freely.

There was no clear separation between data collection and analysis. The process of going back and forth between the collection of data, investigating theoretical approaches and reflecting analytically on the research continued until the end of the study. The balance thus shifted from data collection towards data analysis and then writing the research report. At no point was there a separable analytic phase, analysis pervaded the entire process. Just as the data collection in ethnographic research is messy, with luck playing a significant part in the process, so the analysis has few formal methods. Even triangulation, the traditional ethnographic appeal to validity, has its problems. The classic formulations of triangulation rely on the use of divergent accounts to discern the truth or falsity of an interpretation. In so far as ethnographic research concerns the insider view, reliance on triangulation of different versions obscures how the development of versions constitutes the context for action. The ethnomethodological approach is interested in how different versions, held by different individuals or by the same individual for distinct purposes, constitute rather than reveal the context of action.

Warrant and validity

There have been a variety of criteria suggested by which we may judge the quality of an ethnography and the warrant for its conclusions. The concentration on the unique or detailed description of the particular, contrasts with statistical approaches using representative samples. Whatever evidence is provided to demonstrate truth and validity, it is always open to the challenge of incompleteness and invalidity. This predicament is the same kind we

face making judgements in everyday life. The researcher's difficulty is one of degree rather than nature. The basis for judgement in an ethnography can be summed up in the terms, credibility and plausibility. In this context I mean by credibility a claim that one could reasonably expect the transcript of the conference and field notes to be accurate. They are also materials that are continuously available as checks on accuracy. By plausibility I mean persuasive, that the accounts given would make sense to a member of the conference or another observer even if they were disputed. The applications of these requirements vary according to the centrality of the claims being made and according to the types of account being given. This research, which aims to be descriptive, must be consistent with the empirical evidence. This means both that the information provided is accurate and that the organisation of the material into an account fits the phenomena. The research further needs to show its relevance, and that requires consideration of both the problem addressed and the audience it is directed to.

A tension has been suggested between the ethnographic stress on description and the prescriptive requirements of evaluation. In terms of research findings, this tension exhibits itself in the way in which and the degree to which, the results can inform practice. The claims I want to make in this regard are modest. An ethnographic account can deal with the diversity of outlooks found in the setting. Students clearly have a different outlook on the process of studying for a degree than either their tutors or the institutions that organise academic life. Ethnography allows a portrayal of this variety of accounts available to members of the setting. It allows for the description and in some cases discovery of unintended consequences of policy decisions, in this case the implementation of a course unit taught using computer conferencing and involving collaborative working. It can without ironising particular accounts deal with the performative fronts adopted by participants.

What ethnography "sees".

As an illustration of what sorts of results can be obtained by study and evaluation using ethnographic techniques I have included three observations concerning one student, given the pseudonym Ben Villiers, from the TiC course 1995 - 1996. This allows some of the *flavour* of the description to emerge and indicates the type of information that would not appear using other styles of evaluation. Ethnography's job is "making the work visible"¹⁰. Further examples from the same research can be found in two other published papers^{20, 21}. The use of a single person emphasises the ethnographic approach which rests upon the intensive study of particular cases in their natural setting, rather than either statistical examination of representative samples or experimental techniques.

Adding context?

An example of the interplay of observation and the transcript occurred with the sending of an abusive message that was withdrawn from the conference. Though not explicitly part of an educational exchange the message illustrated features found more widely in the conference and formed part of an important session in the computer lab when work groups were being formed. The message formed part of an exchange on-line which, with the exception of the one abusive message, remained in the transcript. The offensive rap took place in February 1996. I had not been present on the day when the string of messages began. The transcript records a mildly abusive interchange between students discussing a birthday. The messages show a disregard for the public nature of a computer conference as they display some of the characteristics of private talk between friends. I found making sense of the message and its content difficult. I mailed the student who had written the abusive message through the conferencing system, but he was less than forthcoming. He replied that much as he would like to help he had given the tutor his word not to repeat the abuse and that;

"the message Ref: Your Mothers in the BDP Crew is best not mentioned again." (Personal Mail 13/2/96).

It was later brought to my attention by a student from the previous year that Ben, may have had some involvement. Re-reading the transcript with this advice it was apparent he had been messaging in the lab at the same time and with some marginal involvement in the exchange. The student who had given me the information had developed the idea from;

"Just something he said to me about making the suggestion to who ever it was who started the 'stripper thread'. I think he just feels a bit of an outsider because no one wants to work with him." (V.. S to CJ 11/2/96)

Without this chance remark and its reporting to me, the transcript may well have remained opaque, yet the information was there and available to me once *sensitised* to the issue. In this case the transcript alone did not give me a good picture of what went on. My attempts to reconstruct events were largely unsuccessful but when pointed in a particular direction the transcript contained information supporting a reading derived from a *chance*

remark made off-line. The transcript in this way informed a reading of events originating elsewhere, it provided missing context to messages otherwise thought insignificant, the messages read in a new context *confirm* an otherwise unsubstantiated assertion. The educational significance of the exchange may lie in the involvement of Ben at a point when he found himself, not for the first time, outside of any work group.

Bright students

Ben only worked in a group in the early stages of the course unit, contrary to the tutor's intention and explicit instructions. In the first module he worked with two other students including Aref. He clearly developed an antipathy to Aref's ability to garner good marks by hard work rather than flair and this surfaced later in the year. Ben's inability to work in a group may have been compounded by his reputation and self-perception as bright. Ben was identified by others as academically bright and this was given as a reason for his failure to work with others.

“..... if you see yourself as a smart-arsed high flier and there's no parallel group then you may be reluctant to work collaboratively for fear of being pulled down. I'm sure that is Ben's reason.” (Interview with course tutor Field Notes 18/6/96)

This was mirrored in a personal e-mail I received from a student from the previous year's TIC course unit;

“Hi Chris,
I received an interesting message from Aref I think it highlights some of the problems with group work. If you remember Aref got 70% for one of the modules on TIC. Ben was really outraged that someone with such little academic ability should get the same mark as HIM.”
(Vera S to CJ 14/5/96)

The message continued by including the personal e-mail to Vera from Aref which told of a meeting when "someone" came up 5 minutes before an exam and said "Have you seen the marks for Software Dev" and gave the impression Aref had got 43%.

“This message really interested me because it was Ben who got 43% in the software development assignment. What do you think. I think it demonstrates how some people are much better equipped for group work than others.”(Vera S to CJ 14/5/96)

This was another course unit requiring group work in which Ben had a lower mark than Aref who had actually obtained 61%.

One of the remarkable things about Ben's inability to work in a group is the perception of him as a bright student. It is largely off-line, in coffee bar and corridor chats, that staff routinely discuss good or bad students. The students are affected by this and themselves draw up judgements of each other and come to some consensus agreements about who is bright. It wasn't Ben's on-line activity alone that drew attention to his high standard. The capacity of Ben to carry out the work in a conference was affected by perceptions of him and his ability which were generated outside the course unit and the conference itself.

Other students were wary of having to meet standards that would be expected of this student from the tutors and potentially the student himself. There was no evidence of Ben's social exclusion elsewhere, he was a popular student often seen working with others in the computer lab. It was reported to me by staff that he had problems with group work and he told me himself that he didn't like that style of work and was awaiting the third year when it wouldn't be expected of him.

Doing "not hearing"

An example of the effect the non-conversational pattern of messages and time delay can be found in the messages of Ben.

"...if you read this please reply..i get right off never getting any feedback.....i just end up going mad and sending everyone irritating messages " (Ben to Module 3, forwarded to TiC95 Projects 12/2/96).

Ben's reaction is similar to someone being ignored in any social situation but in a conference a failure to reply could mean something else. This message receives only two replies I was aware of, one a public response the other a private mail. This was confirmed by looking at the *History* of the message, a feature automatically recorded by the conferencing software. Only two students from the course that year read the message within one week. Another student from TiC95 read the message later that month and a further two students much later in the year. Not only did Ben merely receive two replies, his message was only read by two relevant parties around the time it was mailed. Within a computer conference it is not clear how to make oneself *heard*.

Order is present at all points of the conference. Conference members design and implement actions at a fine level of detail. Later in the year a thread developed in which Ben sought a group to work with;

"it seems that nobody wants to tell us what they're doing.....or regroup.....or be noisy even....." (Ben to TiC 95 Projects 26/2/96)

Following this message Ben remains amongst a very small group of members of the conference trying to form a project team. From Ben's first message on the 12/2/96 and the tutor mailing a reminder of the project deadline on 1/3/96, sixteen messages are sent. Six of the messages come from Ben, four from one other student and two from the course tutor. Only four students are involved in discussing project work and seven of the messages are sent on one day, the 26th of February. Some of the messages record discussion evidently occurring outside of the public conference areas, in private mail in one case and in face to face meetings;

"Hi ben

When we have our meeting sometime this week i will mention the fact that you are looking for people to join you for the project..." (Aref to TiC Projects 19/2/96)

A number of Ben's messages repeat the word "noise", and his initiating message on the 12 had commented that a lack of response led to him sending "irritating" messages. It seems that Ben's use of the conferencing medium to try and form a group is exceptional, most of the students are doing this off-line and privately. Whilst some messages talk about projects and the organisation of groups there is little or no engagement with Ben. This failure to *hear* Ben could be doing a job, the strategy could be designedly not to engage with Ben so that groups could form without him. This seems to be how Ben read the situation;

"I plan to work alone on a project as it looks as if there is little interest in collaboration from others in the unit" (Ben TiC95 Projects 18/3/96)

In this way doing "not hearing" is similar in character to the kind of phenomena described in conversation analytic research. While transcriptions of conferencing interactions have some features, such as time delay and separate messages, that do not resemble "ordinary" conversation there are others, such as the order produced in the detail of *not hearing*, that indicate a strong similarity.

Discussion

The research reported here would cast doubt on the reliability of transcript for the purpose of evaluation. Transcript appears to be incomplete, a partial record of the activity of the conference. The transcript records activity within the conference software but conference activity takes place outside FirstClass. The on-line text is often a public display, in that the transcribed record is not so much what happened as what is fit for others to see. Students and tutors record those things they believe are acceptable. Ben does not record his thoughts about Aref on-line, anymore than other students comment on Ben's perceived intelligence. The idea that contextual elements can be simply added to the transcribed record is also undermined. The on-line and off-line elements of the conference are mutually constitutive in a way that inhibits the application of formal methods such as content analysis.

A primary problem for communication on-line is ensuring the attention of those who are required to listen. The same problem can arise in ordinary conversation but the means to remedy the failure are more obvious. The transcripts of the computer conference diverges in this way from *ordinary* conversation. Other features of the computer conference and its transcript suggest similar dynamics. Order is present at all points of the conference, conference members design and implement actions at a fine level of detail. Doing *not hearing* is an example from within a computer conference that has similar features to conversation. While transcriptions of conferencing interactions have some features that do not resemble ordinary conversation there are others that indicate a strong similarity.

Conclusion

Though computer conferencing may not be simply conversation, the general approach of ethnography can be applied successfully to the analysis of conference transcripts. This has been reported above and can be found in the ethnomethodologically informed ethnography of Kurland and Barber²³. They have analysed transcripts from the point of view of users dynamically constructing the context of their communication. The exchanges reported above show how the members of a conferencing system actively create the context of their own actions. The conferencing system is not an unambiguous setting that students know how to react to. It is only in the interactions of the conference that students display their ability to accomplish an educational outcome. In distinction to formal methods of evaluation, ethnography explicates the essential features of conferencing as it is formed by social interaction. It is this dynamic process of group formation and the investigation of collaboration and cooperation as it occurs on-line that provides

the focus for ethnographic research.

Ethnographic evaluation can inform design of educational systems. The emphasis on informal practice that emerges from ethnographic research would imply that a complete or self-contained educational system would be self-defeating. The term "bricolage" has been used to characterise a way in which we engage with and conceptualise the world around us²⁴. Derived from the French anthropologist Lévi-Strauss, the term literally means "do it yourself". In English it might be better conveyed by the phrase "cobbling together". The same idea can be applied to the way in which members of a computer conference engage with the technology and pedagogy deployed. Elsewhere John Cawood and I have called this negotiative orientation "contingent technology"²¹, that is the modification and selective use of the given electronic media, the incorporation of other technologies and the use of any tool be it hardware, software or social organisation to achieve the everyday objectives of teachers and learners. In this way designers of learning networks need to take account of the way in which users of technical and pedagogic resources shape them to achieve their objectives.

Designers should expect users of the system to (mis)use the system in ways that are unexpected. A design that anticipates the likely use of the system without adequate consideration of the actual conditions under which it is used is likely to be unsuccessful. In this case the technology and pedagogy anticipated cooperative or collaborative use. In the example given a motivated and bright student found it difficult if not impossible to meet this course requirement. This is not to argue that design is impracticable only that plans are realised as situated actions. The pedagogic design for collaborative working did not ensure its own outcome. It was the practical day to day action of conference members that ensured the accomplishment of the educational objectives. The context of use of the system emerged and was negotiated rather than pre-planned.

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