SCRE Spotlights
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Using Video in Research

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While video is very much a technology of this present age, its use as a research tool is less common than might be expected. This is unfortunate, because, despite its 'technical' nature, there is much to be gained from its use, particularly for non-participant observation. Some of the merits, and the difficulties, of using video in research are illustrated by an account of its role in a recent study of children's use of computer-based interactive stories.

The aim of this small-scale project was to explore how groups of primary children used computer-based interactive stories. The study took an ethnographic approach to collecting descriptive data, using non-participant observation as the principal research method. The main means of observation was by video recordings of the behaviour of small groups of children as they used an interactive story. This was supplemented by still photographs and field notes, and by interviews with groups of children, and with the teacher.

COLLECTING THE DATA

Video recording was chosen for the reasons given by Smith (1981), namely that 'the use of mechanical recording devices usually gives greater flexibility than observations done by hand'. Capturing much of the data on video tape also allowed what Edwards and Westgate (1987) refer to as 'retrospective analysis' - at leisure, and in much greater depth than would have been possible even using techniques involving live coding. Categorisation of the data could similarly be developed more fully after viewing the tapes and adopting an 'open-minded stance', allowing the data itself to influence the design of 'a category system derived from analysing it rather than being imposed on it' (Again, Edwards and Westgate).

While audio tape might have been used to capture pupils' talk, this, on its own, would not have been enough to answer a research question focused on childrens' talk, since it is important, again as discussed by Edward and Westgate, to recognise the potential ambiguities introduced by an analysis based upon words alone. The video served to provide context, together with the opportunity to search for meaning in the dialogue and the actions before and after any specific utterance.

USING VIDEO CAMERAS

Two cameras were used to record interaction, one camera capturing the children's faces and hands, while the other recorded the corresponding children's view of the computer monitor. The children's talk was captured onto one video tape using a pair of very small but powerful directional microphones discretely attached to the computer monitor and facing the children. A less powerful and less directional microphone attached to the rear camera also captured the sound of the children's voices and recorded this onto the video tape containing the children's view of the computer monitor.

The use of two cameras allowed each group to be viewed from two different angles, to provide independent reliability checks by adding to observations of the children (front view), what was effectively a simultaneous observation of their view of the computer monitor, to provide verification of the events of that moment, from a different angle.

The recordings were supplemented by brief handwritten notes created during the observation sessions to record data not captured on the video or audio recordings (such as occasional foot movements in time to music). Still photographs were also taken showing the positions of the computer and the recording equipment, since recall of the past is unreliable without some aide-memoire.

A short structured interview was carried out with each group of pupils as they finished their session at the computer. This was partly to try to verify some of the observational data and partly to add breadth by obtaining information which could not be collected reliably through observation. During the interview each child was asked to read a short piece of the text printed on the computer screen, in order to provide evidence of their reading ability.

THE DRY RUN

Seven days in advance of the scheduled observation session a dry run was carried out with a class of (slightly younger) pupils located in an area similar to that to be used in the study. This pilot run proved invaluable as a number of improvements were made to the physical siting of the

computer, cameras and microphone in the light of the difficulties experienced in this trial run. Changes were also made to the lengths of the sessions and to the interviews. It is likely that without these changes the data collected would have been impossible to analyse.

HOW THE OBSERVATION SESSIONS WORKED

The class chosen was a primary three class of 25 pupils (13 boys and 12 girls). Severe constraints on space in the class's usual teaching bay, and the very high noise level inside the school's open plan building, dictated that the recording session took place in an adjacent bay, vacant for that day. However, classes in adjacent bays often shared computers, and the physical layout of the bays was very similar, so that pupils were not in unfamiliar surroundings.

Altogether, seven groups were observed. Each used the computer-based interactive story for 15 minutes. This was followed by a short interview (four to five minutes). Each group's session lasted 20 minutes overall, fitting neatly into a 20 minute video tape. The cameras were fixed in the same position throughout the day.

As each group came through to the bay, a fresh video tape was loaded into the front camera and the camera started. The front camera (the main camera) was a studio camera using large professional quality tapes which only last 20 minutes. The rear camera was a standard video camera using a normal 3 hour VHS video tape, and was simply switched on at the beginning of each session and off at the end. The recording team consist of the researcher, a camera operator and a sound operator, who all removed themselves from the children's field of vision during the recording sessions, although the children remained in view, and the sound was monitored by headphones as it was being recorded.

To begin each session, the researcher collected the children from their own class bay and brought them into the adjacent bay. The children chose their own seats from the three set out in front of the computer. They were asked their names, and were 'settled in' by being asked whether they knew how to use this interactive story. They were instructed to use the story just as they had done before in class. Their attention was drawn to the rear camera, and they were told that we were interested in how these stories worked and how they were used, and that the camera behind them would be looking over their shoulders and recording what they could see on the screen.

The story was placed in the 'play' mode and the researcher withdrew. After 15 minutes, the researcher approached the children and asked them questions about their use of the story. The reading test was carried out as part of this interview.

PROCESSING THE DATA

The video recording was time-coded in an editing studio. This process places the video tape number and a digital time display onto the picture, which makes rapid and accurate indexing and time references possible. Additionally, the audio tracks were dubbed onto audio cassette to allow the possibility of transcription from audio cassette as well as from video tape.

ANALYSING THE DATA

The talk and actions of three representative groups were analysed both qualitatively and quantitatively. Consideration of the children's actions controlled the design of a coding form which allowed the major features of an event or utterance to be recorded in a form suitable for later analysis. Two main types of event were identified for the purpose of this study: those associated with the mouse, and utterances.

Each group's talk was transcribed from video tape onto coding forms, and relevant actions (such as handling the mouse and pointing at the screen) were added, together with an indication of the times at which utterances and events occurred.

Qualitative analysis was used to determine what pupils talked about and what pupils did. After transcription of the children's utterances, a coding scheme was devised which allowed categorisation of all the utterances. Similarly, by considering the possible states of the mouse as revealed by children's handling of the mouse, a coding scheme was devised to represent the various ways in which the mouse was being used.

Quantitative analysis was used to determine how often pupils engaged in various activities, and for how long. Much of the quantitative analysis was by means of event-sampling, and the data from the coding forms revealed the frequency of some events (such as pointing at the screen) and the duration of others (such as the time taken for each 'turn'). It was in this context that the video tape time-coding was particularly useful.

PROBLEMS AND DILEMMAS

Technical matters were of concern, but these were not the only factors which had to be considered.

Sound quality

The dry run quickly indicated the difficulty of obtaining good quality recordings of the children's voices. Steps were taken to attend to this but the high level of background noise throughout the school meant that, although the sound was monitored using headphones as it was recorded, and voices were heard clearly, the result on the tape was far from satisfactory. This led to great difficulties during transcription, so that two transcribers took approximately five hours to transcribe each 15-minute sequence.

Researcher effect

Attempts to improve the sound quality had involved moving the children to an adjacent class bay, thereby removing them from their own classroom. Some researchers have commented that researcher effect due to non-participant

observers need not lead to severe researcher effect 'where the situation being observed is sufficiently engrossing and demanding of the participant's attention that he or she at least temporarily forgets the observer's presence' (Smith 1981). In this instance, while the observing/recording process did not appear to inhibit the children, they did produce utterances related to the researcher and to the equipment, suggesting a researcher effect. Research subjects who are aware of obtrusive researchers and recording devices 'may well talk more, or talk less, or just talk differently' (Edward and Westgate). However, other researchers, for example Rosenthal (1976) have argued that 'mechanisation reduces observer error'. Seen in this light, the benefits of recording may well outweigh the disadvantages due to the effects of the researcher and the recording equipment.

It would have been possible to move the children to a separate 'quiet room' but it was felt that the improvement in sound quality would be outweighed by the disadvantages of removing the children further from the environment in which they normally used the computer, thereby further reducing the validity of claims made on the basis of the data.

Hiding the equipment

The main camera was large and close to the children's faces, and it would have been preferable if this could have been removed to a greater distance, making it less visually intrusive. While few children commented on, or even noticed, the small microphones, it might have been an advantage if they has been concealed even more effectively. However, there is a serious moral dilemma presented by the opportunity to reduce researcher effect by recording while children were unaware that this was taking place through using concealed equipment. In this study, it was felt that this would be unacceptable and that children should be free to refuse to take part.

THE VALUE OF USING VIDEO RECORDING TO COLLECT DATA

This has proven to be a worthwhile study, resulting in an insight into an important, but normally unconsidered, area of pupils' learning experiences. While there were problems, the underlying method seems sound and, with refinement, the same basic method would be worth using again. In particular, despite the technical difficulties, the way in which the video tapes allowed revisiting of the data for further analysis, or for analysis on a different basis, is thought to be of great value.

It is difficult for a teacher to obtain a true picture of inter-group and group-computer interaction, as both of these are influenced by the presence or absence of the teacher. The video record, however, allows both researcher and teacher to gain some insight into this interaction. That is the power of video as a research tool.

Note

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Further details (see below for the full report) are available from Marcus Bowman, University of Paisley, Faculty of Education, Craigie Campus, Ayr KA8 0SR. The children's collective use of the mouse is discussed in ***Power Play*** *in issue 54 of the SCRE Newsletter.*

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