

WORKING GROUP INTERVIEWING - A SUPPORT  
GROUP Convener: Laurinda Brown, University of  
Bristol

At this meeting Liz Bills and Simon Goodchild, who are both nearing the end of work for PhDs, gave presentations relating to how their methodologies had developed over time. These inputs provoked a good discussion continuing the theme of the link between methodologies and methods in research. What follows are reports of their presentations.

**Simon Goodchild - College of St Mark and St John**

1 I approach my research from the position of 'social constructivist' but not the familiar articulation of radical constructivism making some space for the social. The framework starts from the anthropological account of Lave: cognition exists in dialectical relationships between persons acting, their activity, setting and arena. To this is added elements from Mellin-Olsen's theory of Activity and *only then* making reference to the radical constructivist articulation of cognition. This is itself has the potential for vigorous debate but that is not the present focus. It is, however, necessary to be aware of the theoretical framework to understand the methodology.

2 I then have the research question: What goals do students work towards in their mathematical activity? Again, it is not the purpose of this group to explain why this question is of significance within the theoretical framework, but the question is significant because the methodology needs to attend centrally to that question. The students' goals I want to expose are:

- their rationale for engaging in classroom tasks
- the purpose they perceive in their activity
- their interpretation of their experiences. This last point does not feel much like a 'goal' but I am interested if their activity leads to reflection or whether it is merely 'blind' routine.

3 McIntyre and Macleod state:  
, ... evidence about pupils' thought processes while in classrooms would be directly relevant to attempts to explain processes of classroom learning: our lack of adequate procedures for obtaining access to pupils' or indeed teachers' thought processes ... is the major barrier preventing progress in our understanding of classroom life.' (p20)

By 'adequate procedures' I interpret 'valid instruments which measure objectively and reliably'. My approach is simple - ask them: Why are you doing this? What do you think the purpose of this is? Why do you think (your teacher) has given you this to do today? Do you think this will be useful to you? Have you ever done anything like this before? and so on.

4 Questionnaires are inappropriate because i) they are restricted to the theory from which the questions or topics arose; they do not allow the enquiry to reach beyond the actual questions posed. ii) In multiple choice designs questionnaires tend to force the student to an answer, even when they may not have one. iii) Questionnaires cannot respond to the range of activities which may be met in a mathematics classroom. iv) Questionnaires inviting free, or open, responses require a degree of articulacy or fluency on the part of the respondents which they may not possess. v) Questionnaires are remote from the activity of the classroom.

Interviews are also problematic i) remote from engagement in classroom activity ii) difficult to organise multiple encounters with the student in a variety of circumstances iii) remote from the social and cultural context of the classroom.

So, I chose to engage in unstructured conversations with students during the course of their routine activity in mathematics lessons. Thus I could talk with students on several occasions, the conversations would be framed within the activity in which they were currently engaged, the conversations could explore other avenues of enquiry as they opened up, such as the nature of the students' understanding and the nature of errors they may make. Talking with students at the time they are engaged in activity is an important aspect of the methodology which arises from a theoretical framework which situates cognition as 'spread over' the actors, activity and cultural setting. A common opening gambit may be to ask the student to explain what they were doing or 'teach me to do it', and there are, clearly, common themes to pursue, otherwise the conversation had to be allowed to take its own course whilst probing 'gently' the students' understanding and goals in the activity.

My role in the conversations was to search, challenge and try to expose discrepancies between students' quick, off-the-cuff remarks from deeper reflective ones. The conversations were quite protracted as I tried to eke out as much useful information as possible. The conversations could last up to forty minutes as I sat with a student monitoring and probing their progress through a sequence of activities.

6 I will only try to expose and describe the characteristics of students, arena, activity, settings and structuring resources for the class in which I shared for my research. The case to case generalisation is left to the reader of the report and my responsibility is to provide a sufficiently 'thick' description so that an interested reader can identify common characteristics between the class I describe and another familiar to the reader.

7 I am not a trained ethnographer so, have I any grounds for engaging in this type of research? Can I reasonably expect or ask for any credibility in my data, my analysis and my interpretation? I engage in the research as an experienced mathematics teacher, accustomed to interacting with students in the classroom, comfortable in a mathematics class, with the tape-recorder and transcript to give

advantages of hindsight. I believe that the quality of challenging but not intimidating is one of the qualities which I bring to the research because of my experience in the mathematics classroom. I am able to respond reasonably quickly to students' explanations of their own understanding.

8 Making an impact on the setting is still a concern but being a part of the class for almost a year I become part of the 'arena' and thus the disturbance of the setting is not so profound. I need to consider my position as a mathematics teacher in the classroom. What do I do when I encounter a student with a problem, ignore it or try to help? What is my response when a student asks for help, if I refuse to help them how can I expect them to co-operate with me in my work? When students misbehave what response do I make? Can I ensure that students will feel comfortable in telling me, an adult, to go away if they do not want to talk? The alternative is an oppressive abuse of power, incompatible with my role as a researcher.

(An extended version of this paper can be obtained from Simon Goodchild at The College of St Mark and St John, Plymouth.)

Lave, J (1988) *Cognition in Practice: Mind, Mathematics and Culture in Everyday Life*, Cambridge, Cambridge University Press

McIntyre, D and Macleod, G (1978) The characteristics and uses of systematic observation. In Hammersley, M (Ed) 1993 *Controversies in Classroom Research* Second edition. Buckingham, Open University Press

Liz Bills - MMU, Crewe Campus

I spent nine years as a mathematics teacher in secondary schools and still think of myself primarily as a mathematics teacher. My desire to pursue research in mathematics education grew out of my desire to be a more effective teacher and my practice as a researcher remains closely linked to the practice of teaching.

My position on the nature and results of research in mathematics education is that useful knowledge is knowledge that affects my actions. I am concerned with "knowledge-in-action" rather than "knowledge about". My research is for myself and for teachers. I aim to appeal to their knowledge and experience base in the way in which I present my results.

My knowledge is gained by sensitising myself to certain issues so that I become aware of incidents and of mathematical ideas that are relevant to them. My aim, in my thesis, is to offer parallel experiences to readers.

The question which I am addressing arose from my teaching. Shortly before joining the OU I had spent some time thinking about an area exemplified by this question:

For which values of  $k$  is

$$k(k-1)x^2 + 2(k+3)x + 2$$

positive for all real values of  $x$ ?

The complexity of this question is a result of the presence of two variables,  $x$  and  $k$ , which play very different roles in any solution of the problem. The difficulties apparently presented by the two different roles of the variables were the starting point for my work when I came to the Centre for Mathematics Education at the Open University.

As a teacher I was interested in learning as part of the complexity of the classroom, not just in students' cognitive processes. I wanted to use my years of experience as a teacher and as a learner as a central part of my research. My research had to be based in the practice of teaching. I chose therefore to work with teachers and students in classrooms, in the ordinary course of their work. I observed students working on tasks concerning more than one variable and compared what I saw with my past experience of students' work. I discussed what I saw with the class teachers. As a teacher I set students tasks designed to reveal their thinking. I set myself higher order tasks which involved working with a number of variables and tried to observe my thinking and feelings.

As a result of all of this I formed an intricate picture of what it is like for students to be meeting the kind of problems I have exemplified. The final stage of my work was to test both the validity of that picture and of the means by which I hope to awaken similar awarenesses in other teachers.

I met regularly with two groups of teachers who expressed an interest in my work. I used these meetings to present my experiences and interpretations and to find out whether they were recognised by and seemed useful to my teaching colleagues.

My thesis will combine accounts of my own and students' working, my interpretations of these, and other teachers' accounts and reactions, to present my picture of the students' experiences. This will be set in the context of perspectives from other research writings in the area and a justification of the methods I have chosen to use.

Three issues which arose during the course of my research and which I addressed during the discussion are:

- the change in relationship between myself and the students I worked with as I began to know them as individuals rather than as research subjects.  
I have tried to acknowledge what more I have brought to my interpretation of their speech and actions than would be available to the reader.
- my shift from use of reported incidents (my writing about things which had just happened in the classroom) to use of tape-recorded conversation.

In listening to tapes of conversations at which I had been present I found that my attention was drawn to things I had not noticed at the time of the conversation. I began then to use events which I found striking only in retrospect alongside those I had noted at the time.

- my move away from trying to observe the effects of my actions and towards trying to understand the experiences of others.

I found it impossible to conceptualise the classroom as an experimental setting because I found the "cause and effect" model inappropriate to the study of learning. My question changed from "how can I behave as a teacher to improve my students' learning of concepts concerning second variables?" to "what is it like for students trying to learn these concepts and how can I come to know?"

At the next BSRLM meeting at Sheffield Hallam University on February 24th, 1996 Kerry Cripps of Sheffield Hallam University and Stephen Hegedus of Southampton University both fairly new researchers will offer data culled from work based on interviews to act as a focus for the group to work on links between methodologies and the interpretation of data.