Multiple perspectives in literacy research: integrating the quantitative and the qualitative

The distinction between quantitative and qualitative methodologies has divided researchers over such questions as what counts as research, what counts as evidence and what the principles are by which we connect evidence to our claims (Hillocks 1992). Underlying all these questions are assumptions about the nature of reality and how we perceive and interpret it. Those working in the quantitative tradition posit an independent reality: researchers attempt to eliminate biases, values, preconceptions and emotional involvements. Those working in the qualitative tradition maintain that such objectivity is unachievable. They believe that it is not possible to separate the researcher from what is being researched (Hillocks 1992).

While acknowledging that there are in existence very different metaphors about the relationship of the researcher to reality, in this paper I argue that identifying the commonalities between them is a more generative process than accentuating where and how they diverge. For the two research traditions are not mutually exclusive: rather, they are closely connected and may serve to complement, even strengthen, each other.

This position is not new. There are now many
examples in the language education literature advocating the advantages of multiple perspectives on literacy research which draw on both quantitative and qualitative methodologies (Beach, Green, Kamil & Shanahan 1992).

However, the identification of problems the researcher may encounter and recommendations for how best to achieve an integrated methodology are less common. Indeed, the methodological implications of multiple perspectives on language research remain ill-defined. This paper aims to contribute to the process of articulating and clarifying some of these implications so that approaches to methodology in language research may be reviewed and redefined.

Using my own research in computer literacy education as an exemplar, I explore how the use of the two approaches allows researchers to bring different methodologies and insights to bear on the same question. The review of the study demonstrates that the use of different methodologies achieved a more comprehensive understanding of computer writing than if just one had been employed. However, I am also careful to point out that the use of the two approaches in the one study is
not unproblematic. Efforts to integrate the quantitative with the qualitative may result in decisions which compromise the original research concept and, perhaps, have an adverse effect on some of the participants.

The discussion begins with an examination of my study and how it attempted to blend the two approaches. It is now three years since I completed and wrote up the research, first as a dissertation (Snyder 1990), and then as a number of journal articles (Snyder 1992, 1993a, 1993b). Through a close analysis of the study's methodology, often as presented in these publications, I identify and explain the methodological choices, compromises, even errors of judgement, made as part of my efforts to straddle the two paradigms. Many of these decisions and their effects, I argue, were shaped by tensions between the two methodologies. But these tensions were rarely irreconcilable. They were the kind of tensions that drive inquiry rather than those that resist resolution. The challenge was always to find ways to accommodate them and, in the main, this was accomplished.

In one sense, I am establishing a dialogue between
the researcher I was when I carried out the study and the researcher I now am, advantaged by the benefit of hindsight and the distance of time. It is, therefore, a reflective and reflexive paper. It presents a critique of the way the project was carried out; implicit are suggestions of how it might have been done differently, perhaps better. The paper poses the question: Is it possible to integrate elements of both approaches so that a rich understanding of the complexities of a computer-mediated teaching and learning environment is achieved? The short answer is yes, but at a cost, in particular to some of the participants: in the case of my study, the teacher, and the students in the control group.

The paper concludes with a discussion of the implications of the analysis of the study for literacy research. This final section considers how language researchers might reconcile the methodological dilemmas with which they are confronted as part of the research imperative so that a unified research approach built on multiple perspectives is facilitated.

Conceptualising the study’s methodology

When I was embarking on my PhD research project in
1987, I read Papert's (1987) article in which he reviled Logo researchers who studied the effects of Logo on outcomes. He dismissed such questions as, "What is THE effects of THE computer on cognitive development?" and suggested that this kind of question displayed a lack of understanding of the cultural context in which human development takes place.

In the same article, he also argued how evidence should be collected in a way that acknowledges the centrality of the cultural context. He preferred anecdotal stories, single classroom studies, and ethnographic research methods which were more disposed to highlight the complexities of the cultural context in computer-mediated learning. He derided experimental designs as ill-suited to the task of revealing the multiplicity of variables which affect students' performance when using computers in the classroom (Emihovich 1990).

Mindstorms (1980) had been significant in arousing my interest in the application of computer technology to the classroom, particularly Papert's assertion: "I have seen a child move from total rejection of writing to an intense involvement (accompanied by rapid improvement of quality) within a few weeks of beginning to write with a
computer" (p.30). Yet I was not convinced by his arguments about research questions and methodologies. I valued his emphasis on the culture of the computer-mediated classroom, but, at the same time, was also curious about students' achievement when computers are used. I was not persuaded by Papert's claim that writing quality improves - I required some stronger evidence.

Thus from the beginning, I was caught between the two paradigms. I wanted to know whether writing quality was affected by the use of computers. And it seemed that the best way to investigate such a question was an experimental study which compared the two writing technologies, pens and computers. But also I was aware that writing is a social practice that can be best understood in terms of the context in which it takes place (Cook-Gumperz 1986). And it was clear that the most effective way to explore the complexities of a sociocultural context was by adopting the role of participant/observer in the classroom.

At this early stage of the project, I had already concluded that decisions about research methodologies should not be of the either/or variety. If I subscribed
to one approach then I would sacrifice the possible emergence of further understandings from the other. It appeared that the use of both quantitative and qualitative approaches in the one study allows the researcher to achieve different insights into the same problem. So I set about designing a project which would employ what seemed to be appropriate strategies from both paradigms with the aim of casting the most light on the use of computers for students' school writing purposes.

The title of the dissertation reflects key elements of the two paradigms:

The impact of word processors on students' writing: a comparative study of the effects of pens and word processors on writing context, process and product

Here is the language admonished by Papert: 'impact suggested by 'comparative' and the reference to two writing technologies - pens and computers. Implicit is the notion that the technologies are to be compared for their relative effectiveness. But the fact that the study is interested in more than outcomes or 'products' is implied by 'context' and 'process', two concepts integral to an understanding of teaching and learning, but not
easily amenable to the testing and measurement associated with the quantitative tradition. So the title already signals that this study aimed to be more than either experimental or ethnographic in approach.

The title contains the mandatory colon and in style conforms more to the quantitative tradition than to the qualitative. I had been told that a title should reveal as much information about the study as possible. The professors who gave that advice were psychologists. Criticism of the title came from a sociology of education professor who dismissed it as 'deadly', insisting that I should devise something lighter and more engaging if I wanted to get it published as a journal article.

The use of two distinct kinds of language in the title, each of which is associated with a particular research paradigm, is significant. It captures the challenge I experienced throughout the three years it took to complete the study, but which proved particularly difficult when I was writing it up. Often the two did not sit easily together. Integrating them sometimes seemed impossible.

The following extracts from an article which presented an overview of the study serve two functions.
First, they provide a summary of the study so that the reader has a context in which to consider the central discussion of this paper, and secondly, they exemplify the intended duality of the study's methodology (Snyder 1993a). The extracts appear under the heading 'Method and design':

The purpose of the study was to investigate the impact of word processors on students' writing. This was achieved by comparing the effects of word processors with those of traditional tools within the "real world" of two English classrooms, one using word processors for writing, the other, pens, over a school year.

This paragraph alludes to both approaches: the quantitative in 'impact ... on' and 'comparing the effects of'; the qualitative in '"real world" of two English classrooms' and 'over a school year'. The study set out to look at outcomes but within the context of the classroom and over an extended period. Enclosing "Real world" in inverted commas indicates that the data were collected in authentic classrooms and not in the artificial context of a university laboratory. The inverted commas also suggest that the routines of the two classrooms were altered by the study's design and the
presence of a researcher collecting data.

It continues:

A key question was whether the use of word processors produced more effective texts than traditional tools by examining students' writing samples which represented a range of genres or text types. A further question was whether the electronic tool affected writing behaviours, defined, after Flower and Hayes (1977, 1981), as the individual's approach to problem-solving through writing. Writing behaviours were taken to include the writer's planning, composing and revising processes. A third question was whether differences emerged between the two teaching/learning contexts in which the teacher and students worked together on the development of language and literacy skills in general and writing strategies in particular.

The research questions imply but do not specify particular methodologies. Their very presence, however, suggests hypothesis testing. Questions are more likely to emerge after data collection in a qualitative approach.

The methodology is spelled out in the next two paragraphs:

An eclectic research style was used. Integral to this approach was the perception that the integration of data derived from a number of different sources and reflecting a range of data collection procedures was likely to produce a more complete view of the reality of two writing classrooms, each using different writing tools.

At the core of the study was a quasi-experimental pretest-posttest control group design. Certain factors were controlled by the study's design: both groups of Year Eight
students, all females, had the same teacher; it was planned that both groups would experience the same genre-based writing instruction; the students were assigned the same writing tasks which represented the three main forms of writing commonly taught in the English curriculum, namely Narrative, Argument and Expository Report.

The methodology is depicted as 'eclectic'. And it was. A range of data gathering strategies were used. Writing tasks were assigned and texts collected as part of the pretest-posttest design. A questionnaire, devised to explore the students' composing processes and their computer experience, was administered at the outset and again at the conclusion of the study. I acted as participant/observer, attending all classes for both groups. I recorded observations of the teacher, her teaching approach and her interactions with students in both groups. I also recorded observations of students' behaviours and social interactions. I interviewed the teacher at the end of the study and again after she had read a draft of the dissertation chapter which compared the two classrooms. The students kept journals and evaluated the program at the end of the study (Snyder 1993a, 1993b). I was interested in identifying what made
the computer classroom different from the pen classroom, in what made a particular event in one classroom different from another event in the other classroom. The methodology recognised that an examination of the texts the students produced with the two writing technologies was inseparable from the cultural and social contexts in which the writing occurred.

However, the recognition that at its 'core' the study was quasi-experimental is telling. Although I had hoped to achieve a balance between the two approaches, the demands of the essentially experimental design predominated. If compromises needed to be made, they were usually to accommodate the requirements of the quantitative side of the study. Illustrations of how decisions in favour of one methodology over the other manifested themselves are included in the next section.

Dual methodologies

In this study of computer-mediated writing, I attempted to marry a cognitive psychological approach with a cultural anthropological. As described above, I set up a controlled experiment which also included ethnographic observations. My approach assumed that the
meaning of literacy events can be understood only by studying these events as they occur in authentic settings, rather than as a controlled experiment in a laboratory. I assumed that a singularly quantitative analysis of literacy practices strips away the rich meanings available from observational analysis.

The decision to employ research strategies which represented two different paradigms had a number of effects. First, it had an impact, in some cases negative, on participants in the study. Secondly, it allowed me to achieve multiple views of different aspects of the socio-cultural contexts of the classrooms. Thirdly, it enabled me to make quite strong claims about the significance of the study's findings. These important outcomes of the decision to implement dual methodologies are discussed below.

(1) The impact on the participants

In my role as researcher in a study that designated both quantitative and qualitative data collecting procedures, I was compelled to act in certain ways so that I could achieve particular research objectives
I was obliged to adopt two roles: those of experimenter and participant observer. As experimental researcher, my main responsibility was to ensure that all aspects of the study design, conceived in advance of data collection, were carried out. As participant observer, my task was to record details of the life of the two classrooms as they happened (Goetz & LeCompte 1984).

Even though I recognised that these two research roles were not mutually exclusive (Scriven 1972), tension between the demands of each was inevitable. On the one hand I wanted the treatment of the two classes, except the writing tools, to be the same; but on the other hand, I was also interested in the emergence of differences. Finding a balance between these two seemingly oppositional, even contradictory, research agendas was the most difficult aspect of the study. Indeed, I often felt quite schizoid. For example, one moment I'd be sitting at my desk in the staffroom, checking the timetable against the writing program the teacher and I devised together to ensure that the students in both groups would experience the same learning opportunities.
in preparation for the production of a piece of writing. The next moment, I'd be sitting in the pen classroom, recording the teacher's approach to teaching as well as social interactions among the students, noting any differences from what I'd observed in the computer classroom. I was setting it up so that things would be similar yet at the same time I was on the lookout for differences.

The design also had an important effect on the teacher's approach to teaching and her implementation of the writing program. As reported in interview (Snyder 1992), she found that the research design requirements imposed a structure on the organisation of class time to which she was not accustomed and did not favour. The demands of the design not only placed a burden on the students, but also affected her teaching.

The pressure of a program which was predetermined and mapped out limited her. Furthermore, she felt that the tight program prevented her from getting to know the students in the way she did with other classes. It required her to behave as similarly as possible in both classrooms and this constrained her. She could not implement preferred teaching approaches so that in her view, less than perfect approaches to teaching and
learning occurred in both classrooms (Snyder 1992).

A greater proportion of the pen students' class time than the teacher would have liked was devoted to writing. And in the computer rooms, the constant presence of the computers provoked a sense of compulsion to use them as much as possible in the allotted time. In her perception, both she and the students were constrained by the study design. The result was that both classes were teacher/researcher centred. Any real learner-centred teaching was impossible due to the constraints involved in setting up controls for a classroom-based study. No negotiation of content or process was possible in either classroom. All individuals were constrained - unable to follow through on shared meanings that developed as a group, or identified needs - social, intellectual or skills-based (Snyder 1992). The teacher observed that genuine heuristic processes were suppressed in both classrooms. The essence of the research design, which determined the framework in advance, as opposed to a more evolving and open-ended approach, appeared to interfere with effective teaching and learning.

In interview, the teacher reminded me that on a number of occasions she had complained that there was too
heavy an emphasis on writing at the expense of other important elements of a balanced English program. However, I did not respond to her complaint by reducing the amount of writing and allocating more time to literature, for example. Rather, I insisted that we had to keep to the study's specifications which called for the production of a certain number of texts every two weeks. So the emphasis on writing was maintained for the duration of the study, in hindsight at the expense of other important areas of the English curriculum. In this instance, both the teacher and the students were compromised by the demands of the study design and my belief that they had to be adhered to. (A more detailed analysis of this particular aspect of the research is discussed in Snyder (1992)).

I have identified the ways in which the teacher and the students in both groups were affected by the research design. There is another important factor, which I have not previously acknowledged in articles reporting the study, although I have been questioned about it by members of audiences at presentations I have given based on the study's findings. It could be argued that the
students in the experimental group were privileged at the expense of the students in the control group. Indeed, the computer students were treated differently; they were made to feel special just by the fact that they had greater access to the computer facilities than all the other students in Year 8. They used a technology which the findings suggested contributed to the improvement of the quality of their writing. The pen students did not get to use the school computers for the duration of the study. When it became clear that the computer students had produced better writing, I wondered whether the study's design had denied the pen students an experience which may have assisted their writing development.

Built into the design was the recommendation that the students in the control group have intensive access to the computers in the last six weeks of the school year. This detail represented an attempt to ensure that both groups received equal treatment in terms of educational opportunity. However, when the time arrived for them to use the computers, the study was essentially over. I was anxious to begin analysing the data so I stopped visiting the school each day. When I checked with
the teacher at a later date, I discovered that the students in the pen group had used the computers only several times before the end of the school year: the concentrated series of sessions in the labs that I had 'promised' to compensate for their denial of access had not eventuated.

My sense that the pen students had been disadvantaged reflects an important tension between the two methodologies. The incentive was strong to design a study which would allow a structured, controlled comparison of the two writing technologies. Such a design promised substantive evidence of the relative effectiveness of the two tools. However, intrinsic to the design, although not entirely clear at the outset, was the fact that one group would be privileged over the other.

An alternative design, more in accordance with a qualitative methodology, could have involved one or a number of case studies of classes using computers for writing. These could have been compared with classes still using pens. However, I knew that any differences which may have emerged could not be attributed to the effects of the writing tool. Rather they could be explained in any number of ways: differences between
teachers, writing programs, writing tasks, schools, computer equipment, and the list goes on. Thus although the study achieved its results at some cost, a different methodology did not promise to yield similarly convincing results.

(2) Achieving multiple perspectives

The essence of the debate between quantitative and qualitative approaches revolves around concern with the researcher's perspective. In my study, I began with the understanding that researchers cannot simply rely on their own subjective perceptions of reality, that more systematic, verifiable observations or measures are required. But at the same time, I also subscribed to the view that the meaning of literacy events can be understood only by capturing participants' perspectives of those events. I required, therefore, a research methodology which allows for multiple perspectives: I knew that a single perspective is inadequate for any understanding of computer writing.

This becomes clearer when the metaphor of a lens is applied. Any perspective can be perceived as a lens through which the researcher examines an aspect of
literacy education. The lens, however, does not capture the totality of the aspect. Different perspectives provide different lenses through which to view the aspect; no single perspective is adequate to capture all. Each perspective offers a unique contribution to our understanding; each perspective illuminates a particular facet of a literacy situation. More than one perspective provides a more complete understanding of literacy events, but multiple perspectives are needed to provide the most comprehensive picture (Green 1992).

As a participant observer, I was aware of the multiple realities that operate in any social context, in this case, the two classrooms. I was open to accepting the interpretations of the teacher and of the students of what was happening in the two classrooms, even if they did not concur with my own. The juxtaposition of our different interpretations of classroom phenomena added an extra dimension of understanding to the study's findings (Snyder 1992).

Indeed, there were marked differences between myself and the teacher in our interpretation of classroom events and student behaviour. One explanation of our varying
perceptions is that the objectives governing our responses to the data were different. As researcher I was looking for organising principles and important insights; I had to make sense of the study so that I could write about it. The teacher's response was not directed by the same impetus; she was able to interpret what happened from a more practical, school-based curriculum position.

I've included three examples of instances in which we interpreted events differently to give a taste of the different perspectives. The first illustrates how we differed in our explanations of the work atmosphere in each environment. In my assessment of the characteristics of the two classrooms, I noted that even though both were productive, focused environments in which effective genre-based writing strategies were taught, differences were apparent. I argued that talk in the computer room was more purposeful and work-focused, and that we rarely required the students to write in silence. Yet in the pen room, regularly the students were asked by either of us to maintain silence for periods of up to 30 minutes so that writing could occur. My interpretation was that it was as if we could tolerate noise in the computer context
because at least some of it was unavoidable, but in the pen classrooms we regarded it as unnecessary.

The teacher did not disagree but explained that she felt compelled to request silence in the pen classrooms to ensure that work was completed because of the physical layout of the room - students in groups of eight sitting at adjacent tables. In contrast, in the computer room, students sat separately at terminals positioned around the perimeter of the room, facing the wall. The teacher argued that the physical layout of the computer room encouraged student isolation, while the students' proximity in the pen classroom promoted interaction and talk.

The second illustration captures our different explanations of the computer students' strong engagement with the computer screen. I perceived an intense, almost hypnotic interaction for which an interruption by the teacher seemed intrusive. The teacher, however, did not see it in the same terms. She suggested that perhaps the pen students should have been taken to a room as distinctive as the computer room such as the drama centre. She explained that in the context of the drama room, we would have more closely replicated the 'special
place/special activity' atmosphere of the computer room (Snyder 1990, 1992).

The third example also exemplifies the differences in our explanations of what we observed. In response to my conclusion that in the computer room learning was more independent, self-initiated and peer-mediated, and that a community of writers developed, the teacher claimed that similar inferences could have been made about the pen classroom: that the development of writing skills was teacher-initiated, student-initiated and peer-mediated. She did not regard these phenomena as exclusive to the computer environment.

When I reported the study's findings (Snyder 1990, 1992, 1993a, 1993b), I deliberately juxtaposed our differing interpretations of what went on in the two classrooms. This technique served to reflect the complexity of classroom phenomena. It also suggested that careful consideration should be exercised before making major inferences from the research data. Here the qualitative impulse was in full force. It added an invaluable dimension to the richness of the study's findings. It reminded me as researcher and the readers of the articles interested in methodology issues that an exclusively quantitative approach can overlook, perhaps
discount, even ignore, important understandings. Together, the two versions contributed to the construction of a more complete picture of the realities of the two classrooms.

As already indicated, the multiple perspectives on the events in the two classrooms were not limited to those of myself and the teacher. The views of the students in both groups were also invited and represented in the portraits of the teaching and learning environments that I constructed. The students kept writing journals throughout the study and, at its end, completed an evaluation of the writing program. As with the teacher's perceptions, I juxtaposed the students' views with my own. Sometimes the students' responses confirmed what I had observed; at others, they presented a contrasting, even contradictory, perception of an event (Snyder 1990, 1993b).

Thus the voices of the teacher and the students comprised a critical component of the texts I have written based on the study. This represents a major way in which I achieved multiple perspectives on the events of the classrooms. But at the same time, I cannot dismiss
the fact that as sole author of the texts which have reported the study, I chose what to include and what to omit; I gave the other participants a voice, but it was me who crafted the final narrative. My version of what happened in the classrooms is the privileged version; it has the command of the authorial voice.

(3) Strengthening the study's conclusions

As discussed in the previous two sections, the study's integrated methodology affected the participants, sometimes deleteriously, but at the same time, it allowed for multiple perspectives on computer-mediated writing classrooms. The implementation of dual methodologies also provided the opportunity to connect the quantitative findings to the detailed understandings of the classroom contexts in which the data were collected, thereby strengthening the study's conclusions.

Integral to the study's rationale was recognition that writing as product and process is shaped by and shapes a social context, a context that includes the nature of the writing task and the roles and interactions of the people involved. The study's design permitted
further understanding of the central finding that the computer students were awarded higher marks than the pen students by considering it in terms of the assessments of the teaching/learning contexts in which the texts were produced:

The analysis of the data related to the teaching/learning contexts revealed that both the pen and the computer classrooms were productive learning places in which a genre-based approach to the development of writing skills was implemented by the same competent teacher. However, even though efforts were made to ensure that both classrooms were as similar as possible, important qualitative differences still emerged. It could be argued, therefore, that genre-based writing strategies were even more successful in a classroom in which the teacher was more peripheral and formal instruction time less, a classroom in which learning was more self-initiated and peer-mediated, a classroom in which the prevailing atmosphere was more open and relaxed, and in which a stronger spirit of cooperation and collaboration developed. These environmental factors thus help explain why the writing performance of the computer students was overall better than that of the pen students. (Snyder 1993a, p.19)

The use of dual methodologies served to enhance the study's findings from a further perspective: it increased the overall generalisability of the research. The study attempted to meet criteria for generalisability from both its quantitative and qualitative perspectives, recognising of course that each paradigm conceptualises
the notion of generalisability differently.

The early decision to implement a study which had at its centre a control group pretest-posttest design represented a deliberate attempt to enhance the study's generalisability. The quasi-experimental design facilitated a statistical analysis of a number of measures of the texts the students produced using the two writing technologies. The procedures used to assign, collect and assess the texts as well as the procedures used in the statistical analysis were scrupulously reported (Snyder 1993a). When the analysis yielded statistically significant differences between the two groups on some of the measures, it was possible to make claims about the impact of the use of the computers on the students' writing achievement. For example:

Even though the computer students were relatively experienced with word processing at the outset of the study, and certainly more competent and confident at its end, they were not as proficient with the technology as with the traditional tools they had been using since beginning to write. Yet they still wrote Argument and Report texts, and possibly also Narratives, which were judged to be of higher quality than those of a similar group which used pens. (Snyder 1993a, p.18)
The considerable care with which the ethnographic component of the study was implemented reflected a similar effort to increase the applicability of the findings beyond the population studied. Notwithstanding that ethnographic research procedures generate a descriptive account which is valuable in its own right (Hammersley & Atkinson 1983), qualitative researchers, who have traditionally seen generalisability as irrelevant to their goals, have recognised recently its importance (Stake 1978; Stake 1985; Guba & Lincoln 1981). But rather than emphasising the classical view of external validity to enhance the likelihood that their research will speak to situations beyond the one immediately studied, they have reconceptualised generalisability as 'comparability' and translatability (Goetz & LeCompte 1984). In this way, they argue, qualitative studies gain their potential for applicability to other situations. According to Schofield (1993, p.221):

A consensus appears to be emerging that for qualitative researchers generalisability is best thought of as a matter of the 'fit' between the situation studied and others to which one might be interested in applying the concepts and conclusions of that study.

From the qualitative perspective, the thick
descriptions, which are crucial to provide the information necessary for an informed judgement about the issue of 'fit' (Schofield 1993), featured prominently in the detailed portraits of the classrooms (Snyder 1990, Snyder 1993b).

As efforts to satisfy generalisability requirements were enforced in both the quantitative and the qualitative dimensions of the study, the reward was the ability to make quite strong claims about the study's findings. I was able to speak confidently about the study's implications for both writing curricula and pedagogy:

... the study's findings ... suggest that students may be introduced to argument and expository report writing earlier than is the current practice. Moreover, the findings suggest that there are factors involved in the development of these new writing skills which are complemented by the special features and facilities that word processors offer writers. (Snyder 1993a, p.19)

I identified the need to develop teaching strategies uniquely suited to computers and which take advantage of the greater motivation and increased cooperation and collaboration evidenced when computers are used for writing.
I pointed out that the study:

confirms that the computer writing classroom can provide a teaching/learning environment in which a productive balance is established between formal teacher input and individualised instruction; between teacher-centred learning and peer-mediated learning. It allows advantage to be taken of the increase in learner independence and initiative. Students need not be "protected" from the public nature of computer writing, indeed public scrutiny of writing can be seen to enhance students' writing development. When peer response occurs spontaneously in a computer writing context, teachers are able to develop strategies to maximise its effectiveness. (p.20)

I was able to assert that 'computers are effective for improving the quality of writing' (p.20). Moreover, I could claim that:

... the students' use of the electronic writing tool affected the social relationships and interactions in the classroom, producing changes which were conducive to the development of collaborative and cooperative behaviour. Overall, the study demonstrates that word processors provide both students and teachers with a powerful tool which should be an integral component of the writing classroom. (p.20)

But, at the same time, I was careful to acknowledge the limitations of the study. I pointed to the restrictions of the sample, described as 'socially homogeneous and of one gender' (Snyder 1993a, p.20) and emphasised 'that attempts to generalise the findings to
the total population must be carefully qualified' (p.20). Furthermore, I acknowledged that 'the use of intact groups can be seen as a limitation' (p.20).

As quantitative researcher, I mooted the possibility that a Hawthorne effect was operating in the computer classroom which could have contributed to the findings:

... as the participants were part of a shared community doing something special together, to which particular attention was being paid, they behaved well; their disposition was towards cooperative and collaborative behaviour. It is possible that the teacher and also the researcher were more patient and tolerant, wanting the use of the electronic writing tool to succeed, and benefiting from the intellectual stimulus which any promising classroom innovation may generate. (Snyder 1993a, p.20)

But I also donned my qualitative hat and argued that:

... even though cooperative and collaborative behaviour and higher marks may well be interpreted as deriving from a Hawthorne effect, they are still legitimate phenomena and to be valued. What must be acknowledged, however, is that the behaviours and performance levels might diminish with time as they become habituated. (p.20)

The fact that the study had both quantitative and qualitative dimensions allowed me to make greater claims.
for the importance of the findings than if it had been exclusively either one or the other in conception.

Implications for literacy research

So far the emphasis in this paper has been on my own study. The question for this final section broadens the focus: How can language researchers, whose aim is to improve language education, best examine the literacy classroom? Based on the experience of my investigation of computer-mediated writing, it seems that the most useful perceptions derive from studies which aim at multiple perspectives. Further, these multiple perspectives are best achieved when strategies from both the quantitative and qualitative paradigms are employed. The research challenge is to conceive ways in which to reconcile the inevitable tensions between the two paradigms. But at the same time, it is important to problematise the methodological choices available to literacy researchers and thus expose some of the dilemmas which confront them.

An important first step in the process of reconciling the two paradigms, so that both may be used productively in the one study, is to understand the
differences between them. What needs to be emphasised here is that explaining the differences between quantitative and qualitative research requires more than simply distinguishing between the particular modes of data collection common to each. Indeed, qualitative research is too often defined by its principal data gathering techniques: fieldwork and interviews; and its non-numeric character: verbal protocols, transcripts of subjects' discourse or field notes from participant observation studies (Henwood & Pidgeon 1993).

Clearly, methodology comprises more than data alone. The collecting, analysis and interpretation of data is always conducted within some broader understanding of what constitutes legitimate inquiry. The quantitative-qualitative debate has been positioned between two apparently opposed epistemological extremes: the positivist or experimental and the constructivist or contextual.

Put simply, the quantitative research paradigm emphasises cause and effect. The aim is to establish causal relationships by controlling variables in the service of testing a theory. The theoretical concepts are rendered 'observable, manipulable and testable' (Henwood & Pidgeon 1993, p.15). When these conditions have been
set in place, then the findings can be replicated, generalisations formulated and predictions made. Quantification is critical to this paradigm.

In contrast, the qualitative paradigm emphasises description rather than explanation, the representation of reality through the eyes of the participants, the importance of observing the complexity of what is being studied in context, a view of research as generating hypotheses rather than facts, and an approach to theorising which favours the emergence of theory from data rather than its a priori application (Henwood & Pidgeon 1993; Strauss & Corbin 1990). Distinguishing between quantitative and qualitative research in terms of epistemological positions alerts us to the understanding 'that there are competing claims regarding what constitutes warrantable knowledge' (Henwood & Pidgeon 1993, p.16).

However, just as there are significant differences between the two research traditions, they are also closely linked. Both are empirical. Both are concerned with representing what they observe as though the phenomena have status in some reality independent of the mind of the observer. Both kinds of researchers attempt
to convince their audiences that their reports are accurate and comprehensive. Both explain their methods and present their observations and the contexts of their observations in careful detail. Both use cross checks to verify observations. Both acknowledge the danger of extrapolating from a small sample and so increase the sample size or limit the generalisation (Hillocks 1992).

It is true that the two approaches often focus on different kinds of problems which is exactly why I want to argue that when the two are employed in the one study, the findings may be more far-reaching than if either one or the other is used. If, for example, I had chosen an exclusively qualitative approach and confined my design to observations of the two classrooms and the social interactions which occurred, the findings would have more limited meaning. The study of small groups alone could not carry the weight of the generalisations, even if carefully qualified, developed through the statistical analysis. Taken together the two kinds of approaches in the one study provided a far more convincing set of findings than either could do alone.

Henwood and Pidgeon (1993, p.18) discuss 'the
possibility of strengthening research through the use of a principled mixture of methods'. This captures the essence of what I set out to achieve in my study. I knew that it is no longer possible to discuss language whether written or spoken without ethnographic inquiry, without situating the language. I subscribed to this view when I designed the study and the experience of the research, despite the difficulties, confirmed it. What I attempted to actualise was the theoretical rapprochement between quantitative and qualitative research. Indeed, the experience suggested that the distinction between the two paradigms makes the most sense as a starting point at which to begin thinking about the generation of new theories of methodology in language research.

It seems that researchers need to broaden not only the scope of the questions asked in language studies but also consider which are the most appropriate methods to collect and present data and which interpretive frames should be employed to tell the story of the research. Different epistemological positions - positivism, constructivism and more recently postmodernism, which in its more moderate formulation instils in the researcher a
healthy scepticism, have something to offer. Although for this researcher, at least, an extreme postmodern epistemology, with its attendant relativism, locates the researcher and the readers of the research, in the paralysing nihilism of no structure at all.

What needs to be developed are ways of understanding language behaviour which are both structured and dynamic. Researchers in language education require a flexible, sensitive theoretical framework for understanding and portraying the very complex phenomena of literacy classrooms. As the distinctions between the different approaches to language research become more blurred, new theories to frame and interpret the research promise to emerge. These will include both the story of the research as well as detailed analysis of their structures and patterns.

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