

CHAPTER 3

METHODOLOGICAL CHALLENGES AND CRITERIA FOR RESEARCHING A SOCIAL, CULTURAL, POLITICAL APPROACH

1. INTRODUCTION: RESEARCH PARADIGMS

In this chapter I address the question of what is an appropriate methodology for researching an approach which foregrounds a critical perspective. I raise several issues which I consider to be necessary (but by no means sufficient) in seeking such a methodology and do so by referring to three broad well-known categories, which serve as a map for the rest of the discussion and for locating the research process and description. These distinctions quite commonly made between different research approaches in educational and social science research literature are: i) the empirical-analytical, logical positivist or behaviourist paradigm; ii) the interpretive, hermeneutic, phenomenological or symbolic paradigm; and iii) the critical paradigm, drawing from earlier work by Habermas (1972) (e.g. Bredo and Feinberg, 1982). Such classifications are not in any way exhaustive, we need only refer to the growing research debates related to feminism, postpositivism, postmodernism and poststructuralism (e.g. Neuman, 1997; Guba and Lincoln, 1998), and these categorisations have themselves been critiqued (e.g. Carspecken, 1999). Nevertheless, they have been variously imported into research discussions in mathematics educationⁱ (e.g. Ernest, 1998; Romberg, 1992; Nickson, 1992; Kilpatrick, 1988). Further, it is possible to observe and argue that the first paradigm has dominated mathematics education research, though in recent years, with the strong emergence of constructivism, the second paradigm has also gained much ground (Vithal and Valero, in press).

However, if the research journals and the recent handbooks published in mathematics education (e.g. Grouws, 1992; Bishop et al., 1996; Sierpiska and Kilpatrick, 1998; Kelly and Lesh, 2000; English, 2002) are taken as indicating the state of the art in research in mathematics education then it is reasonable to conclude that the critical research paradigm and related research approaches are under-explored and under-represented in mathematics education research. Hence, it is necessary to ask what exactly is a critical research paradigm, and what, if any relation, could it have to a critical perspective in mathematics education?

In this chapter I discuss what may be considered to be a serious problem in researching a critical perspective in mathematics education – that of a researcher

trying to find resonance between her research approach and her educational approach. The search for a research methodology for investigating a critical perspective in mathematics education takes two routes – one into mathematics education and the other outside it – which is then reified in the discussion of the relationship between the researcher, the research participants and the research process. This leads to questions about criteria for evaluating quality in critical research such as validity and generalisability where some alternative suggestions are made for consideration. Finally, I return to issues of context and the problems of change and disruption so characteristic of educational settings like South Africa and question assumptions of stability and continuity built into imported research methodologies.

2. A CRITICAL APPROACH TO RESEARCH VERSUS A CRITICAL APPROACH TO EDUCATION

An educational approach has been described and a particular research process constructed through which its realisation into mathematics classroom practice is being explored. From the description of the research method given in the previous chapter it might be asked, what is the underlying theoretical base supporting the empirical work and methodology? Further, what is the relation between any theoretical assumptions upon which the research process rests, and the educational theory that is being examined in its interpretation into practice? Indeed, what could or should be the nature of the relation between an educational theory under investigation and the “research theory” supporting the research process and relationships within a study?

Typically, the theoretical framework set out in a study provides some of the theoretical tools by which the data will be analysed. But is it possible to explore a deeper, more broader link between the theory underpinning educational practices and the research enterprise in all its facets: such as in the nature of the question asked, the relation between the researcher and the researched, the involvement of the research participants in the activity of data generation, and so on. Such an assertion itself is founded on the assumption that there is no neutral and value-free research just as there is no neutral and value-free mathematics education. The problem then is to not only understand the assumptions which (dis)connect theory and practice but also to make explicit and interrogate the theoretical perspective that informs the research methodology through which that link is explored and understood.

In the way in which the above questions are framed, one could posit a possible separation in the theoretical considerations within an empirical study. That is, a possible disjuncture between the educational theory and the theoretical framework upon which the research rests. The research paradigms distinguished above will assist, as we will see, in making visible the theoretical assumptions in the research process and the fundamental ideological differences in how research is understood, engaged and its goals achieved.

Let me clarify and illustrate this issue of the link or disjuncture between theoretical considerations in a research methodology and theoretical considerations in

educational practice through an example from my research. In seeking to explore the theory-practice relation with respect to a critical perspective in mathematics education, perhaps an approach to the research could have been to develop a set of criteria or prescriptions from the theoretical landscape to guide the student teachers, to follow this with classroom observations and interviews with them, and then to analyse the data against a predetermined set of indicators of this critical perspective to mathematics education. The idea that a set of criteria or indicators can be found and applied in the research process comes into a serious and significant contradiction with the theoretical positions within a critical mathematics education and conflicts with the educational process. That this is observed as a conflict, of course, depends on how a critical perspective in mathematics education is understood. Taking a critical perspective in mathematics education cannot be equated to, as Skovsmose and Nielsen (1996, p. 1260) point out, “a sort of methodological principle”. They argue that critical mathematics education does not refer to a particular form of mathematics education but rather to a perspective in an educational landscape which involves mathematics. As such, it cannot be outlined as a set of rules for action and content and then followed in order to realise a “critical mathematics education” because the researcher does not know *a priori* the exact nature of the transformations that may take place in a particular arranged situation. For Skovsmose and Borba (2000), although critique and transformation are central to both the educational and research endeavour, they include uncertainty and doubt, and therefore are rooted in collaboration. A main issue here, is that of *resonance*, a complex notion, representing a complex relationship, well beyond a simple one-to-one relationship between a set of education perspectives and a set of research methodologiesⁱⁱ

The problem can be concretised more sharply with reference to classroom research. In the educational theory, a particular educational relationship is argued for between teachers and pupils, for instance, pupils cannot be “forced” to become critical. The question to be considered is then similarly, what should the research relationship be between the researcher and teacher? Teachers too cannot be “forced” to take a critical perspective in mathematics education. Hence, the difficulty is that whilst the educational theory is located in a critical paradigm, the theoretical underpinnings in the research, could be described as becoming lodged in say, a positivist paradigm. My experience in trying to explore a critical perspective in mathematics education is that this conflict arises quite easily if the theoretical assumptions on which the research is based are not deliberately considered by the researcher in the research process and their connection to the educational theory is not identified and maintained. What needs to be understood is how and what mediates the way in which a researcher understands the theory-practice relation and chooses to act in particular ways as a researcher (e. g. observer or interviewer) and in constructing research relationships. In this research it has to do with my views about what constitutes a critical perspective in mathematics education versus the research paradigm in which I locate myself as a researcher.

One difficulty in grappling with these problems is that the literature on critical mathematics pedagogy seldom makes its research methodology explicit. In the review of research and literature on ethnomathematics Gerdes (1996) admits that “Ethnomathematical-educational research, including the study of possible

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