

RESOURCE MATERIALS DEVELOPMENT IN ENVIRONMENTAL EDUCATION: Exploring Some of the Myths and Tensions in Participatory Resource Development in the *We Care* Primary Project

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INTRODUCTION

This paper on environmental education resource materials development represents some of my 'lived experience' (Malone, 1994:20) as a researcher involved in clarifying the processes of materials development for junior primary classrooms. The sites of inquiry, action and reflection have been focussed around the development of the *We Care* Primary materials, shifts in orientations to environmental education and current educational change.

The initial aims of the project were to:

- * Address the need for environmental education resource materials for the junior primary phase;
- * Make use of an action research orientation to guide a process of participant-centred materials development which would challenge the assumptions of the more traditional RDDA (research, develop, disseminate, adopt) model of materials development;
- * Facilitate participation in the materials development process by actively seeking teacher involvement.

Through reflection on the research processes, assumptions and project action, I will attempt to illustrate the emergence of myths and tensions in the development of a participant-centred orientation to materials development within the relational dynamics of the *We Care* Primary resource materials development project.

BACKGROUND: SHIFTS IN ENVIRONMENTAL EDUCATION

Significant changes have taken place within the past decade in South Africa. Preparation for political changes, the election and political settlement in 1994 have been some of the

broader societal influences which have extended the need for "a broader environmental capacity to support people in a healthy, sustainable manner" (Taylor, 1995:i). Taylor emphasises the importance of linking environmental issues with educational processes, and states that environmental education has the potential to "enhance our understanding of environmental problems and refocus our thinking on education" (1995:i). Janse van Rensburg (1994) recognises the need to interpret environmental education and research in the context of social change, and regards environmental education as having a key role to play in such change.

Through academic debate, curriculum and resource development and grounded activities, ongoing "shaping, reshaping and expanding clarity in environmental education" (O'Donoghue *et al.*, 1994:40) have been occurring within broader societal shifts and changes. O'Donoghue (1994) in a review of some of the key shaping influences within the design and development of resource materials, describes the way in which the development of resource materials have contributed to the emergence of enhanced orientations to environmental education. He recognises that clarifying shifts in education (eg. the demise of structuralism) and the deepening of the environmental crisis have been two key factors contributing to the shifts in environmental education.

The changes in environmental education have been described as being 'profound' (O'Donoghue *et al.*, 1994:40) and their significance is visible in the emergence of diverse orientations to environmental education (Janse van Rensburg, 1995). Many conventional approaches to environmental education are, however, being questioned and various authors (Janse van Rensburg, 1994; O'Donoghue, 1993; Popkewitz, 1991; Robottom, 1991) argue that many of these approaches are based on modernist assumptions which contribute to

environmental degradation, the educational crisis (Schreuder, 1994) and the 'risks of wealth production' (Beck, 1992). O'Donoghue draws our attention to the challenge facing environmental education nationally and globally by stating,

we urgently need tangible alternatives to the modernist models of environmental management and education that have proliferated in southern Africa over the last decade (1993: 36).

Modernist assumptions underpinning the more traditional RDDA (research, develop, disseminate, adopt) materials development model have been repeatedly challenged (Ashwell, 1992; Lotz, 1995; O'Donoghue, 1990; Robottom, 1987; Taylor & O'Donoghue, 1988). This approach to resource development has been criticised for its social engineering assumptions (O'Donoghue, 1990); its managerial-hierarchical outlook (Robottom, 1987); its reductionist assumptions of social change (Popkewitz, 1984:24); and for its lack of participation by the end users of the materials (O'Donoghue & Taylor, 1988:3). These 'top down' approaches to materials development have been further challenged by the emergence of participatory orientations (O'Donoghue & Taylor, 1988) which are being further clarified through ongoing reflection and debate (Lotz, 1995; O'Donoghue & McNaught, 1990; O'Donoghue, Taylor & Nel, 1994). In a summary of a workshop held on research priorities for environmental education in Africa, Schreuder and Taylor recommend that research on environmental education resource materials development should focus on participatory processes and should address the important area of support to the formal curriculum (1995:21).

CHANGE AND THE FORMAL CURRICULUM

The development of the *We Care* Primary research project has taken place over a period of four years (1991 - 1995). Central to the process has been the recognition of the influence of broader societal movements

which have had an impact on the conscious striving for transformation in formal education. The call for educational transformation has gained the status of a national priority. Key attention in policy reconstruction, constitutional debates and the media is given to issues and debates around educational reform and transformation. The development of a number of policy documents and educational movements, the merging of education departments and restructuring within the education system provide some of the social dynamics which have influenced the project. An additional influencing factor has been a move to reposition primary education (National Primary Education Conference proceedings, 1995) and address issues of the teacher's role and status, gender discrimination, inappropriate curricula, transformation of teaching and learning practices, resource materials and other aspects necessary for the establishment of quality education (Baxen, 1995; Flanagan, 1995; Lenyayi, 1995; Lotz, 1995).

The drive for educational transformation is motivated by a move towards the democratisation of education supported by wider societal change, the realisation that people from all walks of life are being miseducated (Schreuder, 1994) and a recognition that education which reproduces the modernist ideals and ideologies of the dominant social paradigm is contributing to the deepening of the environmental crisis (Janse van Rensburg, 1994; O'Donoghue, 1993; Stevenson, 1987). In addition, we should recognise that the current educational crisis has largely to do with past trends and ideological practices, which purposefully worked towards the disempowerment of teachers at all levels of education (Giroux, 1985; Lotz, 1995). A recognition of this condition in South African education is to understand the theoretical precondition complexities of teacher participation in transformation initiatives.

Samuel & Naidoo (1992: 8) recommend that serious attention be given to the question of teacher participation in curriculum development in the construction of a new education system and that the role of the teacher should not be too narrowly defined. They recommend that alternative roles for teachers need to be explored which will enable them to contribute to the process of transformation in education. In exploring the question of how teachers can participate in reconceptualising their roles, it seems appropriate that a new view of teacher work be conceptualised which will challenge existing stereotypes and the technician metaphor (Lotz, 1995:11).

Teachers already constitute a massive educational resource for the project of transformation. They have more knowledge about children than any other group, a knowledge that individuals have gained over many years or even decades (Lotz, 1995:4). The great majority of primary school teachers are dedicated to their work and are anxious to do it better (Walker, 1988:46). As such they offer potential for educational transformation from within the educational arena. Policy, curriculum and materials development decisions are often made without enough attention to the contributions of teachers who are closest to the site of real transformation.

Moves towards participatory-oriented approaches to transformation are to be seen on the ground in examples of projects such as PSP, PREP, The Molteno Project, TOPS, MEP, and many others (Levy, 1994). Hargreaves (1994) and others working in the field of educational reform (Davidoff, 1993; Flanagan, 1992; MacDonald, 1991; McNaught & Raubenheimer, 1991; Robinson, 1994; Walker, 1989) recognise and advocate for a move away from rationalist, managerial approaches to change. This developing tradition of participatory orientations to educational transformation further motivated the initial focus of this research project.

Through exploring the shifts in orientations to environmental education, research and educational transformation, an unfolding exploration of different social processes which influenced the development of the resource materials can be mapped. This can help to clarify the role of this project in educational transformation.

MAPPING THE WE CARE RESOURCE DEVELOPMENT PROCESS: PHASE ONE

The emphasis of this paper is not on the nature or content of the *We Care* materials themselves, but rather on how they have been developed and shaped through critical reflection and reflexive research action within an ongoing action research orientation to participant-centred materials development. Throughout the development process, the various versions and formats (pilot version, re-developed materials, additional drafts and final products) of the *We Care* Primary materials have acted as the capital for this participatory resource development initiative.

An historical perspective on the *We Care* Primary project shows how this project developed in response and as a follow-up to a materials development project which started in 1987. The original *We Care!* (Southern African Nature Foundation (SANF)) pack of materials were adaptively developed by a small team of experts around a Canadian rationale for environmental education. This initiative was criticised for its technicist outlook, 'blanket-marketing and packaged' outlook and the mailing list participant contact (O'Donoghue & Taylor, 1988:5). An observation that the likely potential of the project would not be reached if participant contact was not maximised (O'Donoghue & Taylor, 1988:5) and the emerging shifts in orientation to environmental education resource materials development (O'Donoghue, 1990) gave impetus to an alternative development approach for the follow-up materials which (in 1990) were

being conceptualised as the *We Care* Primary materials.

A collection of ideas and activities were gathered by a group of educationists and edited into a pilot package of materials which were to provide the capital for a research process into environmental education materials development for junior primary classrooms. In 1991 the materials were prepared by Share-Net and the SANF, in collaboration with Stellenbosch University. A set of seven pilot booklets were developed around key environmental education concepts and 2000 copies of these materials were disseminated to schools around the country. A questionnaire requesting responses was included as a means for eliciting teacher feedback on the materials.

A more intense process of trialling and testing 200 copies of the materials was planned for the Western Cape. Workshops to encourage trialling and testing, use and meaning making with the materials were set up with teachers through local environmental education networks and teacher centres. Teacher participation in these workshops was after school time, voluntary and the result of an interest in the project. A second series of workshops were planned to follow-up on the teacher input from the first workshops, to collect teacher feedback on the materials and thus to enable teacher input to inform the direction of the project. An additional feature of these workshops was reflection on the need for resource materials for this phase and the teaching of environmental education in junior primary. Curriculum and structural constraints, an emerging perspective on classroom realities, the interrelated social realities and processes of school and classroom life were considered as possible aspects which could contribute to the nature, format and developmental process of the materials. Data collection for phase one of the project was done through the compilation of a research diary, focus group interviews, workshop contributions and

documentation. These methods were used to capture teacher input and feedback on the materials, their experience and opinions, social realities and other aspects which could inform the project.

In reflecting critically on the research activities, research orientation and outcomes of this phase it was clear that the distinctions between RDDA and participant-centred approaches are not as clear-cut as the theoretical conceptualisation of these models would have us believe. Whilst elements of the RDDA model were still evident in the participant-centred approach, the process went beyond that of simply receiving and using the teachers' information to re-develop the materials, but gave rise to a rather more complex process of grappling with the need to address the diverse environmental problems that were being identified by teachers and how to use these localised issues as sources for relevant curriculum development.

By withdrawing teachers from their classrooms and schools to teachers centres, and by only arranging two contact sessions with these teachers, the initiative remained separated from the sociological, spatial and historical realities of the school. In essence, this process was largely directed by my agenda of looking for teacher approval and affirmation of the resource. Although teachers were participating, the nature and extent of their participation was questionable, with little or no lasting teacher development or classroom reform resulting. In this phase it was I, the researcher, who was responsible for setting the agenda for the research action, for directing the educational practice of the teachers. I was attempting to 'convince' teachers of the merits and need for environmental education and materials like the *We Care* Primary which I thought could be appropriate for all environmental education activities in junior primary.

In reflection on the rationalist elements of the RDDA model which were still prominent

in the research action, it was clear that whilst teachers (practitioners) were involved in the research, a limited amount of participation was solicited to provide validity to the participatory claims of the project. The notion of participation and the methodologies employed to create opportunities for participation were reminiscent of technicist strategies for change. The notion of teachers as technicians carrying out instrumental type activities to validate or 'rubber stamp' the materials was a reality which in part resulted from a dependence on structure, transmission and information transfer style workshopping, and also from a lack of the realisation of the complexities of participatory orientations to change. The teachers were being asked to test the effectiveness of the materials, and to provide feedback which would ensure the effective redevelopment of these same materials. The overall view of educational change being supported through these actions and assumptions remained to a large extent a centre-periphery strategy. Although it included critical elements and was guided by an action research orientation, the materials development process during this phase retained many of the rationalist and technicist assumptions which characterise the RDDA model (Robottom, 1987:92).

Critical reflection and data analysis in this phase of the materials development project highlighted the following issues which, through a reflexive research process, would be carried forward to the second phase of the research process:

- * Increasing awareness of the limited nature of the teacher participation in the materials development process and the need to further investigate not only the nature of the participation, but also ideological and methodological assumptions which were being made about the notion of participation. Notions of empowerment, facilitation and control in participatory orientations needed to be investigated further.
- * A need to further investigate the redevelopment of the pilot materials as a stimulant for further development of materials to address or include more specific local environmental issues. (Teacher feedback and workshop action pointed out that many environmental issues were not addressed in the pilot materials).
- * A need to consider the structure of materials, and how issues of flexibility and choice influence classroom practice, curriculum development, the use of the materials and the meaning which teachers were making with the materials.
- * The need to find ways of enabling ongoing and more consistent participation to enable the conditions for the development of materials which were centred around local environmental issues.
- * A need to reflect on my role as researcher, the power relations implicit in the research activities, as well as the concept of researcher as facilitator of research and project action.
- * A need to reflect on the chosen research orientation of the study, and to reflexively respond within the research project to enhance the research process.

This phase could then be reviewed as the combining of an 'expert-centred' approach which includes elements of the RDDA model, and a 'participant-centred approach' which show a concern for the meaning teachers have made from the materials themselves, and the process of their involvement.

The paradoxes inherent in assuming allegiance to - and uncritical acceptance of - a particular approach or model of materials development becomes apparent through the reporting of this research action.

Assumptions of participation need to be clearly understood in historical, sociological, methodological and ideological terms if a 'pseudo-participation' as mapped by the first phase of the *We Care* Primary project are to be avoided in participant-centred approaches to environmental education materials development. Further reflection on the nature of the participation in the first phase of this project reveals assumptions and inconsistencies within the theoretical propositions which underpin action research approaches to resource development. The need to fully understand issues of process, orientation and substance gave impetus to reflective deliberation on action research as orienting framework for this study.

CHANGING ORIENTATIONS TO RESEARCH WITHIN THE PROJECT

Emerging with the shifts in thinking in environmental education, and with the emergence of participant-centred approaches to resource materials development and curriculum development, was a move towards an action research orientation to research and evaluation in environmental education (Lotz & Janse van Rensburg, 1995; McNaught & Raubenheimer, 1990; O'Donoghue, 1990).

An action research design enabled ongoing active involvement in a hands-on education project which involved teachers in the resource development process. The concept of *praxis* which enabled action informed by theoretical ideas, was a key concern of this research project. The research was to create opportunities for teachers to develop skills, research and grapple with the problems inherent in the process of educational transformation, and develop self-reflective action through developing materials relevant to their teaching/learning contexts. An action research orientation which supports a problem centred participatory approach seemed to be a useful option for resolving problems during this process. The research design was exploratory and open-ended and developed around ongoing

resource development action, literature reviews, reflective deliberation, consultation and dialogue, and involved ongoing cycles of planning, research action and critical reflection.

McTaggart cautions that, given the complexity of real social situations, in practice it is never possible to anticipate everything that needs to be done, nor is it possible to experience action research as neat, controlled or contained cycles of planning, action and reflection (1992: 2). The mapping of phase one of the project reveals some of the complexities of 'doing' action research. These are reflected in diverse problems and assumptions enacted through the research activities. One such problem was the size of the participating group which was influenced by the fact that the research started with the trialling of over 200 booklets in the Western Cape. The logistics of establishing and maintaining contact with the teachers gave rise to the situation in which teachers were 'withdrawn' from schools and classrooms in large numbers to 'participate' in the research process.

The development of the action research process, extended inquiry through dialogue, critical reflection and 'triangulation' of experiences during and after phase one of the research process all contributed to project direction and growth. Ongoing literature reviews and deepening theoretical insights about the nature of action research and environmental education research, helped reveal the emerging paradox becoming visible through methodologies to ensure participation in the research project. I initially assumed that by working with an action research orientation. I would be doing research which would counter some of the

modernist assumptions of the positivist research tradition. What became apparent was that the action research orientation was being used as an 'implementation device' for externally created change ideals. The participants were participating, whilst I, the researcher, was engaged in cycles of critically reflecting on the research action.

The metaphor of 'outsider looking in' seems appropriate here. By continuing to work within a positivist view of the change process, disguised by the rhetoric of critical theory and assumed emancipatory orientations in phase one, I merely succeeded in reinforcing the teacher's intellectual dependency on the 'facilitator' or researcher. Continued requests for more workshops seemed to reflect this facet. The myth of individual empowerment from outside became visible through the enactment of action research as a technique for implementing change.

Critical reflection and inquiry into the role of the researcher as 'facilitator' within the dynamics of the project and the relationship between researcher and researched became a focus of the research project. The dominant, positivist paradigm of action research denies the presence of the subjective humanity of the researcher and the influence that s/he may have on the research process (Bozalek & Sunde, 1993/4). While critical and reflexive orientations to research stress the importance of documenting the effects of interaction between researcher and researched. Taylor recognises the role that the researcher can play in resource development initiatives in environmental education by commenting on the importance of a dedicated co-ordinator in the *Enviro-Facts* project (1995:5). The importance of establishing reciprocity and a non-hierarchical partnership relationship through which trust can be fostered and authentic, as opposed to expected, data can be collected is underscored by a number of feminist researchers working within critical and reflexive orientations to research (Bozalek & Sunde, 1993/4:74).

Critical reflection on my role and relationship with participants in phase one of this project led to further examination and questioning of power and hierarchy, the nature of participation, the workshop content and objectives of the research. In attempting to address some of the power

relationships which were emerging in phase one of the project, the concept of reflexivity provided a useful conceptual tool for gaining further clarity on the emergent issues.

Reflexivity, in action research, which involves "critical self reflection both of the researcher him/herself and the effect that s/he has on the research process" (Bozalek & Sunde, 1993/4:78) became an important aspect of post phase one reflection, as well as part of phase two research action. Wilkinson (1988 in Bozalek & Sunde, 1993/4:78) distinguishes between 'personal' and 'functional' reflexivity, although she sees them as closely linked and inseparable in any research process. Personal reflexivity refers to the researcher's own identity which includes the personal characteristics, values and personal interests of the researcher, and the influence these aspects have on the research design and direction. By focusing on personal reflexivity, the researcher is able to focus on changing perceptions and shifts in orientation within the research process, as well as on the motivation and social processes which enable and influence changing perceptions within a research project. Wilkinson's concept of functional reflexivity is concerned with the realisation that knowledge production and legitimation, research action and methodologies and their use within a research project are historically situated and shaped. The choices we make about ideological positions and in particular the methods we use (Wilkinson in Bozalek & Sunde, 1993/4:79) are influential in the orientation and differentiation of our concepts and thus constructing our knowledge.

Janse van Rensburg identifies a 'reflexive' orientation to environmental education research in which social processes of change are regarded as a focus for research. She sees a reflexive orientation to be concerned with broad processes of social transformation through "critical and contextual review and action" (1994:14). Within this orientation, Janse van Rensburg (1994) sees environmental education "as a

collaborative and reflexive search for solutions, where reflexivity refers to 'critical social processes of experiential review'" (O'Donoghue in Janse van Rensburg, 1994:14). An emphasis on the importance of dialogue and the social situatedness of learning emerges as being important to research processes, which in turn become inseparable from the educational process (Janse van Rensburg, 1994) or, as in this case, from the process of materials development.

In reviewing action research approaches and the research design followed in phase one of this project, technicist approaches to action research were revealed. Teachers were co-opted to gather data for use by the researcher to inform the re-development of the pilot materials, and not necessarily for self-reflective action within the classroom. A technicist scenario (Nel, 1987) was emerging in which I, the outside expert with pilot materials, set out to gather information and insights from the teachers, without paying sufficient attention to ongoing support and sustained research action with the participants. The situations which could facilitate collaborative and reflexive searching for solutions to problems and ongoing tensions through critical review and experience, were not a concern during this phase.

However, consistent engagement with the issues of action research and social change revealed the complexities of 'doing social science' and it became clear that I, as researcher was confronting a multi-dimensional challenge which is aptly described by Goodman in the following quotation:

Scholars not only are faced with questions about how to generate projects worthy of social inquiry, how to enter particular educational settings, and how to find informants in those settings, but also must question the rationality used in developing presuppositions about social reality, the ethics of their work, power relationships between themselves and those whom they observe, and the

reporting of their experiences (Goodman, 1992:118).

Clarity beyond technicist notions of action research are emerging with the view of environmental education research being enacted *within* rather than on or for environmental education (Janse van Rensburg, 1994:15). The research design and project action in phase two reflects a concern for clarifying and embracing the research processes, rather than a concern for management, facilitation or empowerment through action research strategies. A shift in the research orientation embraces the notion of action research as a critical social process, in which the relationship between researcher and teachers and users of the *We Care* Primary materials is reconceptualised as partnerships of people involved in the critical co-construction of materials around common issues. The valuable characteristics of action research which enable immediate contributions to the practical improvement of the research action and the flexibility to respond to changing circumstances and new insights (Ashwell, 1992) continue to provide the project with a useful orienting framework. The research orientations in this project reflect Popkewitz's statement that "the social and educational researcher appropriates, exploits, reformulates and verifies ideas that have their roots in social movements" (1984:preface).

MAPPING PHASE TWO OF WE CARE PROJECT: A REVISED ORIENTATION TO PARTICIPATION IN RESOURCE MATERIALS DEVELOPMENT

Phase two of the research project can be described as a search for making sense of unresolved experiences and engagement with new social and research predicaments which had been illuminated by the first phase of this research project and broader educational changes. Popkewitz notes that "the character of research is also responsive to the issues and dilemmas confronted by the larger society" (1984:24). In this phase the direction of the research project changed

and the research activities proceeded within a diversity of interrelated sites of change and transformation. These were:

1. Critical processes of reflection on, and reflexive response to issues of research, research orientation and research methodology;
2. Critical processes of reflection on, and reflexive action to create and sustain enabling conditions for authentic teacher participation within the project;
3. Establishment of and interaction with a widening network of teachers and 'sites' of critical curriculum development and materials development activities;
4. Critical reflection on, contributions to and reflexive response to various broader educational events such as INSET (In-service Education for Teachers) debates, curriculum development processes, inter-departmental links, subject advisor support and networking;
5. Engagement within the relational dynamics and tensions inherent in the meeting and merging of local, participatory materials development processes and the goals and traditional orientations to educational publishing which are grounded in RDDA models of materials development;
6. Grappling with the social and historical realities of classroom practice and educational change.

For the purposes of this paper, further description of the research action will be limited to a discussion on the reflexive response to enabling the conditions for teacher participation within the project (site 2 above). Reflection on the status of the teacher as decision maker and participant in the reform process and reflection on my role as researcher in the materials development process, motivated a more rigorous investigation into the notion of authentic participation and the processes which enable participatory materials development. A central focus for this phase was to reflexively respond to the weaknesses and paradoxes emerging from the participatory orientation

of the first phase. Finding ways of embracing a notion of authentic participation which is based on core democratic values, mutual and non-hierarchical relationships between participants, respect for each other's endeavours and the diverse social interactions which emerged from the materials' development and use also provided focus for this phase.

During this phase the site of the materials development activities shifted from working at teacher centres and centres 'outside' of schools to sessions of three or more workshops which were held at schools with junior primary teachers. The format of these workshops were different to the first phase workshops. Instead of being informative workshops, the nature of the workshops could be described as being more exploratory with a focus on the discussion of local issues and creative processes of generating curriculum ideas for use in daily classroom practice. Time was also spent on discussion of the nature, format and structure of materials which were being developed. The materials from this phase were to extend the initial series of materials which were the result of the re-working of the pilot materials in phase one.

A number of shifts were emerging from the attempt to make the research action more authentically participatory and collaborative. More emphasis was being placed on understanding and mapping the sociological and historical influences on the project and on creating the conditions needed for reflective practice rather than on technician methods of evaluation and assessment of materials. The complexities of creating the conditions necessary for educational transformation and authentic teacher participation became apparent, whilst it was clear that sustained support and supportive environments for critical reflection on practice were needed if teachers were to become reflective practitioners. The establishment of ongoing workshops, a widening supportive network, the supportive use of materials and informal

discussions around issues of concern on a fairly regular basis were some of the research actions which reflected the shifts in this phase.

The apparent need for supportive environments and ongoing sustained project action, led to an inquiry into the nature of INSET (inservice teacher education) as many teachers wanted support for changes in their classroom practice. The importance of support for teachers wanting to change their own or their school's practice in any meaningful way is highlighted by many projects and authors involved in the provision of INSET (Davidoff, 1993; Goodman, 1994; Robinson, 1994). Through discussions with teachers on issues of change and support, it became apparent that INSET (similar in nature to that provided by phase one and two of the *We Care* project) is currently experienced by teachers as an ad-hoc, un-coordinated part of teaching. Teachers seemed to be attending a diversity of 'courses' and 'programmes', some of which were contradictory and often varied in quality, creating more confusion than consistent value for teachers (Lotz, 1995:8).

Through this phase it became obvious that support for lasting transformation should be sustained in ways which reach beyond 'courses', 'programmes' or 'initiatives' (Davidoff, 1992; King & van den Berg, 1994; Lotz, 1994; Robinson, 1994). Arguments for whole school and school based INSET and transformation activities are being advocated as possible conditions for meaningful transformation (Davidoff, 1993; Schonfeld, 1994). Davidoff, in her thesis reflecting on action research work in the Western Cape, comments as follows:

an understanding of the change process suggests that real change is far more likely to occur when the context in which teachers are working is taken into account, and when teachers themselves are actively involved in the change process ... from this perspective, it would

make sense to do INSET work with teachers at their schools and classrooms (Davidoff in King & van den Berg, 1994).

The project action which developed during this phase therefore had a greater emphasis on school based materials development around local issues. The focus of the activities and materials being developed was no less pre-determined, and were more emergent within the social processes of interaction taking place with individual schools and groups of teachers. The research action was more dependent on personal interaction and the establishment of working relationships with the teachers and schools, concern for authentic participation, mutual respect and democratic practice. Through different processes at different schools, a variety of materials were developed around a range of local issues (eg. street safety, decision-making, water, violence and waste management). In addition, the ideas and materials developed were first developed in draft form, and then shared, refined and re-developed through interaction with teachers from other schools.

An interesting aspect which emerged through the research around the trialling of phase two materials, was the realisation that all knowledge is partial, and that the resource could change with each encounter with new participants. As co-ordinator of the materials development process, I realised that at some stage, the development of a resource will cease to be in process, and will become a product. To determine the extent and length of time for participation in any materials development project became a further issue for investigation. An interesting relationship between developed materials (as products) and materials in development (as process) emerged during this phase. The completed materials (products) were being used as a stimulant for further activity development around other issues and themes and became a tool and support for critical reflection on the

nature, format, style and processes of further materials development. Taylor notes that resources can "support reflection and action to enhance people's capacity to engage with environmental issues" (1995: 6). In the same way, resources were supporting an engagement with educational issues and issues of materials development.

Reflecting on the research action and the process of materials development followed during this phase, the following emergent features could be highlighted as contributing to the sum clarification of participant-centred approaches to environmental education materials development:

- * School-based discussions and school-based curriculum and materials development initiatives are good sites for a focus on local environmental issues as a source for learning;
- * A move towards whole school or whole department (J.P.) curriculum and materials development was proving to be more effective and authentic than approaches which 'remove' teachers from their schools;
- * More, ongoing workshops and discussions with groups of teachers which are built on established working relationships are more effective for the development of local, issue-based resource materials;
- * 'Empowerment' of teachers does not occur as a result of external intervention or the transferral of information, but rather through a process of creating, supporting and participating in the conditions which enable social interaction and discussion around common issues.

CONCLUSION

One of the key aims of the research initiative was to investigate and clarify participatory orientations to environmental education

materials development and to find ways of developing relevant curriculum materials that would be flexible and adaptable to local environments. This resource development process has set out to, in some way, move away from modernist notions of change and transformation to meet the demand for more relevant education in the junior primary phase, and address a chronic lack of resource materials for this phase.

Through mapping the shifts in orientation to both research design and methodology, as well as research and project action within the relational dynamics of the *We Care Primary* project, new ways of conceptualising and enacting materials development processes are emerging. The revealing of myths and assumptions, and the "clarification of modernistic delusions and reflexive reconceptualisations of ways of engaging with the environment crisis" (Janse van Rensburg, 1994:17) may contribute to both the maintenance of a healthy environment and the transformation of education which is needed to provide for quality education in our classrooms.

Through engagement with some of the above issues, I have tried to show some aspects of the social processes in which this research and resource development has occurred; to show some perspectives on the social role of the intellectual or researcher in this process; and to point out how these processes are directed by history and context, values and interests and,

how our methods of research emerge from our involvement in our social conditions and provide a means whereby we can seek to resolve the contradictions we feel and the worlds that seem unresolved in our everyday life (Popkewitz, 1984:preface).

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