



National Foundation for Educational Research

WHAT'S THE USE OF RESEARCH IN ENVIRONMENTAL EDUCATION?

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Abstract

This paper aims to raise questions and stimulate discussion about the use and usefulness of research for improving practice in environmental education. It reports findings from a recent collaborative project entitled 'Education for Sustainable Development – Making Research Count'. This involved a researcher and seven practitioners working together to explore connections between research and practice in environmental education. Examples and experiences from this project are discussed in relation to various models of research utilisation. Consideration is given to the kinds of research ideas that interested the practitioners, and the ways in which these were used by the practitioners in their individual contexts. The paper ends by suggesting that questions of research utilisation need to be seen within the context of wider debates about professional learning, research-engaged schools, pedagogical change and collaborative inquiry.

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This paper is concerned with the perennial issue of the relationship between educational research and educational practice. It reports findings from a collaborative project entitled 'Education for Sustainable Development – Making Research Count' which involved a researcher and seven practitioners exploring connections between research and practice in environmental education. The aim of the paper is to raise questions and stimulate discussion about the use and usefulness of research for improving practice in environmental education.

The discussion is structured into five main sections. The first section provides some brief background to the project in terms of notions of evidence-based practice and research utilisation. The second section outlines the aims and methodology of 'Education for Sustainable Development – Making Research Count'. Consideration is then given to the ways in which the practitioners involved in this project made use of the research. Section 4 reflects on these research-practice connections and the insights they provide into the use and usefulness of research in environmental education. The paper ends by raising some strategic issues and theoretical considerations for future work in this area.

1. Evidence-based Practice and Theories of Research Utilisation

The last ten years in the UK have seen considerable criticism about the limited impact of educational research on policy and practice (e.g. Hargreaves, 1996; Tooley and Darby, 1998; Hillage et al., 1998). Linked with this has been an increased prominence of notions such as 'evidence-based' and 'evidence-informed' practice within the discourse about education in England and Wales. This 'evidence movement in education and social policy more generally' has had a significant impact on research:

'Recent moves in academic and policy circles to strengthen the social science research evidence base have raised questions about the quality and status of educational research. They have suggested a need for systematic research synthesis, for greater accessibility of sound educational research evidence, and greater respect for the perspectives of the different stakeholders in the educational research process' (Oakley, 2002:277).

Looking within the field of environmental education research, there are signs of similar kinds of arguments and developments. Palmer (1999:394), for example, proposes a need for 'policy and practice in environmental education to continue their move away from a randomness of approach that leaves much to chance, towards research-based endeavours that encapsulate reliability and some of the realities of human motivation and cognition'. In a similar way, Reid's (2001:4) introduction to a recent edition of a practitioner journal argued that: 'Inspecting the evidence base is a welcome corrective to authoritarian exhortations and political conjuring that tried to make some forms of environmental education appear while others disappear'. His view is that 'good and bad practice in environmental education should rely on tradition

and the power of persuasion less, and on scholarship and enquiry more' (ibid:4).

In connection with calls for evidence-based and evidence-informed practice there has been increased interest in the nature and purpose of research utilisation (e.g. Wellington, 2002:166-183; Hemsley-Brown and Sharp, forthcoming). Within the literature, there are a number of different models of research utilisation, all underpinned by different understandings of research, practice and their inter-relationships. A useful three-fold breakdown of such models is provided by Estabrooks (2001) writing within the field of nursing research. She distinguishes between:

- ♦ **instrumental research utilisation** – which 'implies a concrete application of research, where the research has often been translated into a material or usable form' and 'is used to direct specific decisions and/or interventions'
- ♦ **conceptual research utilisation** – where 'research may change one's thinking but not necessarily one's particular action ... In this kind of research utilization, research informs and enlightens the decision-maker'
- ♦ **symbolic (or persuasive) research utilisation** – which 'involves the use of research as a persuasive or political tool to legitimate a position or practice' (ibid.:283-4).

Further insights into research use are provided by Hammersley's (2001) discussion of the differences between an 'engineering' and an 'enlightenment' view of research use, and Wittrock's (1991) outlining of eight models of interaction between 'social knowledge and public policy'.¹ Taken together, their analyses highlight the contrasting philosophical and theoretical bases of the three models cited above (Table 1).

Aside from these theoretical models, however, a recent review of empirical research in this area shows that the evidence base on research utilisation in education is a limited one (Hemsley-Brown and Sharp, forthcoming). The situation is still one where:

Surprisingly little attention has been given to establishing what teachers already know about research and researchers, and what specific questions teachers themselves would like to see answered by research. (Everton *et al.*, 2002:374)

This would seem to be equally true for environmental education research as it is for educational research more generally.

Table 1: Three Models of Research Utilisation

	Instrumental Research Use	Conceptual Research Use	Symbolic Research Use
Theoretical basis	Engineering model	Enlightenment model ²	Adversary model
Research use	Application of research findings or specification of rules or procedures based on them	Involves practical judgments on the part of the practitioner about what is appropriate and useful	Use of selected pieces of research to justify particular positions or practices
Research	Providing specific and immediately applicable technical solutions The main or only knowledge source to guide practice	Provides concepts which come to play a part in how practitioners define problems One among several sources of knowledge which practice can draw	Provides ammunition for partisan battles One of many kinds of information that can be used to justify a position

Sources: Estabrooks (2001), Hammersley (2001) and Wittrock (1991).

2. Education for Sustainable Development – Making Research Count

It was against the backdrop of these kinds of debates that a recent UK project entitled *Education for Sustainable Development – Making Research Count* was initiated. This drew upon a review of research on environmental learning (Rickinson, 2001), and involved the author of this review working collaboratively with a small group of practitioners to identify implications from the research for the teaching of education for sustainable development (ESD).³ The work was funded by the National Foundation for Educational Research in England (NFER), the British Educational Research Association (BERA) and the General Teaching Council of England (GTC).

Aims

The project constitutes what has been termed a ‘user review’. This draws on the distinction that has been made between reviews aimed at other *researchers* (‘academic reviews’), and reviews targeted towards other *research users* (‘user reviews’) (Bassey, 2000). A ‘user review’ is defined as ‘a document that arises from an academic review, but which is devised and written by researchers and users working together’. The aim of a user review is ‘to inform critically the thinking of a particular audience of policy makers or practitioners’ (Bassey, 2000:25).

The aims of this user review project were three-fold:

- ♦ To initiate a one-year collaboration between a researcher and a small group of practitioners involved in undertaking ESD.
- ♦ To explore the practical implications and potential uses of the research findings reported in the academic review, and ways of communicating these in engaging ways to practitioners.
- ♦ To generate (i) an innovative document and website for teachers highlighting recent research relating to ESD, and (ii) a model and reflexive account of undertaking a collaborative user review with practitioners.

Methodology

Drawing upon ideas emerging from the literature on collaborative research (e.g. Hall and Grant, 1991; Ulichny and Schoener, 1996; Clandinin and Connelly, 1988) and recent research-practice initiatives (e.g. Baumfield, 2001), the project sought an approach that was *collaborative*, *flexible* and *reflexive*. In other words, the methodological onus was on facilitating a genuine and open exchange of ideas between participants (collaborative); which was responsive to participants' interests and open to unexpected project directions and outcomes (flexible); and provided opportunities for reflection about the process as it evolved and developed (reflexive).

The project team comprised a researcher and seven practitioners from a variety of institutional contexts, including primary school teachers, secondary school teachers and outdoor/community educators (Figure 1). These were individuals who responded to a small 'advertisement' about the project placed by the researcher in an edition of an environmental education practitioner newsletter.

Figure 1: The Project Participants

<p>Primary school teachers</p> <ul style="list-style-type: none">♦ Celia Aspinall – a Year 1/2 teacher and school grounds coordinator in a Hampshire primary school.♦ Andy Clark – a Year 1 teacher and ESD coordinator from an Eco School in north east Manchester.♦ Sandra McLeod – a Year 3 teacher and Humanities/ESD coordinator from a primary school in Hackney, London. <p>Secondary school teachers</p> <ul style="list-style-type: none">♦ Lara Dawson – a geography teacher in a school in north Bristol.♦ Jim Rogers – a geography teacher and Head of Year from a school in Plymouth. <p>Outdoor/community educators</p> <ul style="list-style-type: none">♦ Prue Poulton – environmentalist in residence in the London borough of Hackney.♦ Julia Sargent – Head of Education at an outdoor education centre in Oxfordshire.

The project has been running for one year and has involved:

- ◆ four one-day meetings of the researcher and practitioners
- ◆ tasks carried out by the practitioners between the meetings
- ◆ ongoing discussions with, and support from, the researcher
- ◆ various presentations and dissemination activities.

An important part of the project was the provision of supply cover costs to enable the participants to have release time for project meetings and tasks.

The project's development can be seen in terms of three stages:

Stage 1: Sharing our practices and perceptions – a sharing by participants of information about their EE/ESD practices, and their perceptions of research in this area and how (if at all) it might be of help in their context.

Stage 2: Examining the research in relation to our practice – examining the review and considering collectively and individually what the connections and the gaps are between the research and our practical contexts, and what implications for practice (and research) emerge from these.

Stage 3: Documenting and sharing our findings – considering, as a group, how we can share what we have learnt with other practitioners (implications for ESD practice) and with other review groups (user review model and process).

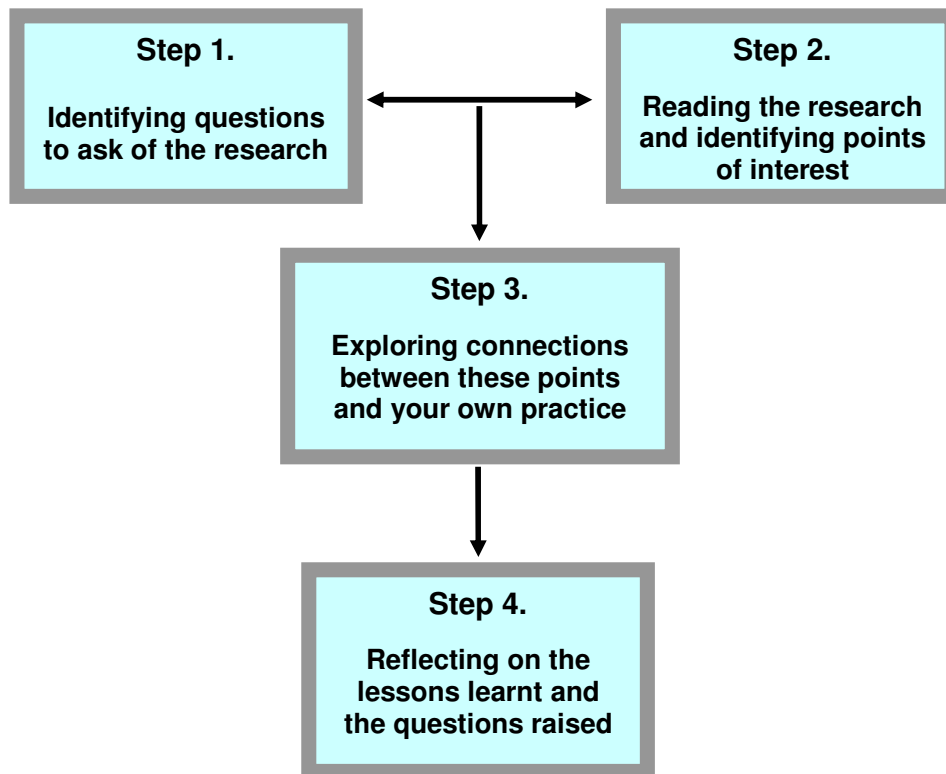
The project is now nearing the end of Stage 3, and publication of the user review is scheduled for later this year (Rickinson et al., forthcoming). The next section considers what is the most important part of this document: the practitioner case studies.

3. Case Studies of Research Utilisation

The user review document stemming from this project contains case studies written by each of the practitioners about how they made use of ideas from the research in their school/centre (see Appendix 2 for an example). The case studies were developed through a series of four steps (Figure 2), which involved the practitioners:

- ◆ thinking about their practice and identifying questions to ask of the research
- ◆ reading the review and identifying ideas that might relate to their practice
- ◆ trying to use these research ideas within their own school/centre
- ◆ reflecting on what they had learnt and how this might develop further.

Figure 2: A Four-Step Model of Research Use



This section attempts to provide a flavour of the case studies that emerged from this process. The discussion is structured around two questions:

- ♦ What research ideas interested the practitioners?
- ♦ How did they make use of these ideas in their own contexts?

What research ideas interested the practitioners?

Looking across the seven case studies, it is possible to identify three categories of research findings that particularly interested the practitioners in this project. These were:

- ♦ research findings that were supportive of school-based environmental education
- ♦ research findings that had clear implications for practice
- ♦ research findings that provided information about learners.

Research providing support for environmental education

Five of the seven practitioners made specific reference to findings in the review that they felt were supportive of school-based environmental education. Ceila, one of the primary school teachers, for example, reported that:

'In reading the research, I was interested to see if there was anything that could help with our efforts to develop a more holistic approach in the curriculum. I found several supportive ideas, such as
(i) *"young people see television and school as the two most important sources of their environmental information" (p.246)*
(ii) *"it is the beliefs and practices of environmentally motivated teachers which are the most significant elements in promoting young people to undertake environmental action" (p.261)'.⁴*

Similarly, two other primary school teachers, Andy and Sandra, both noted the point that:

'Studies of intergenerational influence suggest that students, after participating in environmental education activities, are capable of influencing the environmental attitudes and/or behaviours of their parents (p.289)'.⁴

Sandra felt that this supported her beliefs and helped to provide *'justification for the teaching of ESD in schools such as ours'*.

Research with clear implications for practice

The practitioners also expressed interest in research findings that highlighted certain practices as either helpful or unhelpful to students' learning. For example, two of the primary teachers took note of the statement that:

'Teaching about environmentally responsible actions without considering why they are beneficial can increase young children's misconceptions (p.238)'.⁴

Meanwhile, the two secondary school teachers, Lara and Jim, picked up on other ideas which linked to their teaching of global environmental issues within geography. For example, the statements that:
'The term pollution is particularly unhelpful ... children need to be made more aware of the specific pollutants (p.236)'.⁴

'Certain visual and metaphorical representations can be unhelpful to the development of learner understanding (p.237)'.⁴

Another example, which featured in three of the case studies, concerned research emphasising the importance of parental involvement:

'It is necessary to work simultaneously with the child and the adult to support both the children and adults in the catalytic process (p.286)'.⁴

Connections were made from this to various kinds of school grounds events involving parents, pupils, staff and the wider community.

Research providing information about learners

Another focus for the practitioners was research that provided information about the children or young people that they teach. Andy's case study, for example, noted that:

'Whilst with all research it is difficult to come to a conclusive overall view, in my opinion the research was helpful. The key points that I found of interest were:

- ♦ *young people appear to hold generally positive environmental attitudes (p. 254), but there are various specific issues that are of concern to students, and these issues, and the amount of concern for them, differ between individuals (p. 247-53)*
- ♦ *all children bring prior knowledge to lessons and this can be incorrect/confused (p.232), and teachers have to be aware of this when teaching*
- ♦ *"students are critical consumers, rather than passive recipients, of environmental curricula" (p. 284)'.*

These three points noted by Andy are all fairly general; other teachers focused on findings relating to specific groups of young people. Sandra, for example, who works in inner city London, wrote the following in her case study:

'Most significantly research findings confirm that, for various reasons, there is less concern for the environment among inner city children than in other areas. For example: 'Roper Starch Worldwide's (1994) survey of young people in the US found that concern about the environment relative to other social issues was significantly greater among the students from non-disadvantaged areas' (p.253). We also found confirmation of our belief/experience that many inhabitants of disadvantaged areas are more likely to be concerned about local environmental issues, such as litter and pollution than about global environmental issues.'

In a similar way, the secondary school practitioners were most interested in findings that related to the age group of their students. Lara, for example, was intrigued by the research suggesting that:

'Most high school seniors lack the necessary understanding to go beyond the common recognition of an issue and use their knowledge to grasp the consequences of environmental problems or offer solutions for those problems (p.232)'.

How were these ideas used?

The ways in which the practitioners made use of ideas from the research were varied and complex. These can be conceptualised, though, in terms of five categories of research use:

- ♦ justifying/providing support for practice

- ◆ challenging/raising questions about practice
- ◆ reflecting on/making sense of practice
- ◆ investigating practice
- ◆ changing practice.

A crucial point to note is that the notion of ‘teachers’ practice’ being used here is a broad one. In other words, ‘practice’ is not necessarily just what practitioners do, but also how they think, how they plan, how they feel about what they do, how they talk about what they do, and how they reflect on what they do. It is about thinking as well as doing, and beliefs as well as actions. This emerged from the project as a crucially important idea for understanding the various ways in which research can engage with the world of practice

Justifying/providing support for practice.

Research provided justification for the practitioners in two ways: personal affirmation of one’s own practice; and evidence to convince others of the value of one’s practices. With respect to the former, Celia described how *‘the research supported our concerns and beliefs for a broader, enriching curriculum’*. Through reading the review, she also came to realise that her school had *‘many practices already in place which support aspects of the research’*.

In a similar way, Prue (who works as an environmentalist-in-residence for schools in inner London) said that the process *‘has supported my own belief in my way of working’*. For example, she was encouraged to find research that supported *‘long-term initiatives and programmes [rather than] sporadic input’*, *‘input from home as well as school in developing environmental awareness’*, and the practice of *‘linking environmental work to a live issue’*.

Prue also voiced the second kind of justification, because she described how the project had given her *‘quotable evidence to use when approaching new schools’*. A similar point was made by Julia, the Head of Education at an Outdoor Education Centre: *‘The findings add credibility to our existing Education Outreach programme and will help with funding applications’*. She also saw a connection to strategic planning within her organisation:

‘Some of the findings will be used to validate issues which always appear in long term strategic planning such as repeat visits, which schools are targeted, practical work, and age groups’.

Challenging practice.

It was evident for some teachers that the research had raised questions that challenged their practice. In the words of one of the secondary school teachers, Jim:

'At the time of reading the research I was teaching a Year 9 group about environmental issues. This involved a series of two lessons on the greenhouse effect and ozone depletion, in which I tried to make it explicitly clear that the two issues were distinct and separate.

However a series of questions were raised by knowing the 'confusion or fusion of issues is not simply one of knowledge...but also one of conceptualisation' (p. 233):

In what way could I challenge and develop students' conceptualisation of these issues to reinforce their understanding and distinguish between cause and consequence?

Would it be as simple as asking students to design diagrams of global warming and the ozone layer to support written answers?

Should the conceptualisation come from the teacher or from the student?'

A similar response was described by Julia:

When I read the research there were certain ideas that seemed particularly relevant to our work:

- ♦ *'students are active experiencers, rather than passive recipients, of environmental curricula, and respond to learning situations in individual ways' (p. 302)*
- ♦ *'students' environmental factual knowledge can vary for different environmental topic area' (p. 227) and 'can be influenced by gender, schooling and socio-economic grouping' (p. 228)*
- ♦ *teaching styles can influence students' learning about environmental issues positively and negatively (p. 233).*

These research findings roused emotive and powerful questions for me as a practitioner. In particular:

- ♦ *have we realised that students are critical consumers rather than passive recipients?*
- ♦ *do we assume too much about children's willingness to be out and about in the countryside?*
- ♦ *are we sure that the information we teach is accurate and relevant?'*

Reflecting on practice.

Another use for research was as a frame with which to reflect on one's practice. Sandra, for example, found that the research helped her to make sense of the difficulties her school had experienced in developing ESD in an inner city context. As she explained:

'Having read the research, particularly those parts which refer to the teaching and learning of ESD in inner city areas, some of the reasons for our lack of

influence became more apparent. Initially, and perhaps most significantly, research findings confirm that, for various reasons, there is less concern for the environment among inner city children than in other areas. For example:

'Roper Starch Worldwide's (1994) survey of young people in the US found that concern about the environment relative to other social issues was significantly greater among the students from non-disadvantaged areas' (p.253)

We also found confirmation of our belief/experience that many inhabitants of disadvantaged areas are more likely to be concerned about local environmental issues, such as litter and pollution than about global environmental issues.'

Investigating practice.

For some of the participants, using research meant doing some research of their own. In four cases, the practitioners undertook some kind of investigation in their school/centre as a way of responding to findings in the research. Their motivations were of two kinds:

(i) wanting to test the validity of findings in their own context – This was clearly illustrated by Lara who was curious and doubtful about the idea that young people have poor understandings of global environmental issues. This, she explained,

'made me feel that I wanted to test the validity of the statements with some of my students. I felt that if the research 'held up' in my personal test, then I would be in a position to try to do something to address this issue in my own teaching'.

The same was true for Andy, one of the primary school practitioners, who wrote that:

'The research also made me want to find out more about my own pupils to see if certain ideas from the research were confirmed at my school'.

(ii) wanting to explore and find ways to address issues raised by the research – Julia's case study provides a good example of this, because it involved her investigating a specific question that arose from her reading of the research ('*Are we sure that the information we teach is accurate and relevant?*'). She explains how she selected and then set about exploring this question as follows:

'I decided to focus my efforts on the last of these questions as I thought this would be the easiest to investigate in the time scale of this project. I also felt that investigating this would have a real and immediate impact on what we do and how we do it. In order to explore this further, I undertook two main activities: (i) discussion with team members and other colleagues; and (ii) observation of team members and other colleagues'.

Changing practice

The final way in which research was used was in stimulating and/or helping to bring about changes in practice. Jim's response, for example, to the research about 'young people frequently confusing and/or fusing ideas about environmental issues' was a desire to find out how this could be reduced. As he explained:

'I wanted to find information that might help explain why these misconceptions were happening, and how I could change my practice to make it more effective'.

This led to him: *'adopting a range of techniques for presenting the information to meet different learning styles'; 'being far more specific and explicit about teaching global warming and the ozone layer'; and 'looking for better ways of displaying images, such as with visual props (balloons, woolly hats and sunscreen)'.*

In the primary school context, Andy reported that 'Reading the research has affected my teaching, and has made me think more deeply about my own practice'. One example from several given by Andy is:

'The research showing that children have an interest in environmental issues, and have certain issues that they are particularly concerned about, affected how I worked with two children preparing a talk with me for the Tameside Earth Summit. Together we explored what they wanted to say at the summit, and how best to present their ideas, rather than me teaching first about the subject and suggesting to them what they could say'.

4. Emerging Insights into the Use and Usefulness of Environmental Education Research

Having outlined these various research-practice connections, this section considers what these might tell us about the use and usefulness of research in environmental education. It is suggested that they help to highlight:

- ◆ the (surprising) usefulness of research
- ◆ the diverse uses of research
- ◆ the active, emotional, context-dependent nature of research utilisation.

The (Surprising) Usefulness of Research

It is clear from the case studies described above that the practitioners in this project did find ways in which research could be useful to them in their professional contexts. There are examples of research providing support, raising challenges, stimulating reflection, promoting further enquiry, and initiating change. The significance of this is underlined by several of the practitioners' written comments about the project. Sandra, for example, ended

her case study by stating that: *'In conclusion, I feel that the research has and will be valuable to me'*.

What is also clear, though, is that for some of the practitioners this usefulness came as something of a surprise:

'The findings from the research have been informative and accessible. It has surprised me how useful it has been.'

'The research findings are far more valuable than I originally thought they could or would be.'

This raises important questions about how research is perceived by practitioners, and how researchers might better understand the reasons for, and implications of, such negative perceptions.

The Diverse Uses of Research

A second emerging insight concerns the diversity of ways in which research can be useful to practitioners. Across the seven practitioners there were examples of five different types of research use, all drawing on different ideas from the research, and connecting with different aspects of practice. Within this diversity, though, it is interesting to examine the extent to which examples can be related to any or all of the three models of research use outlined earlier (instrumental, conceptual, and symbolic).

There is, in fact, a marked imbalance between the instrumental (little or no examples), and the conceptual and the symbolic (several examples). In relation to the former, there were no clear examples of the practitioners applying research findings in an instrumental manner. Interestingly, this was in spite of the expectations of several of the teachers who entered into the project with hopes of gaining *'something easy and useable that can be put into practice'*. This is not to say that there were not examples of the research acting as a stimulus for pedagogical change, but that these involved processes of reconceptualisation rather than implementation of ideas direct from the research.

Many of the connections that were made, then, were of a conceptual and/or a symbolic kind. The conceptual model was seen in several cases where the research served to raise questions, stimulate reflection and/or promote investigation into the teachers' practices. Julia, for example, responded to certain ideas in the research by working with her colleagues to explore the factual correctness of the ideas their centre were teaching to visiting children. In a similar way, Jim and Lara started to problematise the ways in which they teach about certain environmental issues in their geography lessons: *'I now constantly wonder if students have understood what I am teaching'*.

There were also a number of examples of a symbolic use of research. Several practitioners noted findings that they saw as supportive of school-based environmental education. Their interest in these was usually for their potential

as ‘ammunition’ in: ‘*justifying the teaching of ESD in schools such as ours*’; ‘*giving quotable evidence to use when approaching schools*’; and/or ‘*helping with funding applications*’.

In addition to these examples of conceptual and symbolic connections, there was another type of use reported by the practitioners. This was where research provided support or confirmation of practitioners’ current ways of thinking or working. This shares some similarities to the model of symbolic use, but was focused on personal verification, as opposed to public advocacy. This was seen with Celia coming to realise that ‘*the research supported our concerns and beliefs for a broader, enriching curriculum*’, and Prue gaining ‘*support for my own way of working*’ with schools. The significance of this kind of personal validation was emphasised in several of the case studies. Andy, for example, concluded that: ‘*Crucially, the research has made me believe that what I am doing is important*’.

An interesting point made by Hammersley (2001:150) is that while this type of research use ‘may be very common [...] many researchers undervalue or positively reject it [...] probably because it shows no obvious sign of “impact” of research, since practice remains the same’. This, he asserts, is an argument which ‘forgets that change is not always for the better, and that stability has intrinsic benefits’ (ibid.:150). This raises the important question of researchers’ comfortableness with the varied uses that practitioners might make of research, and the extent to which researchers are legitimated in taking a stand on such matters. When, for example, does research use become *abuse* or *misuse*, and by whose criteria are such distinctions made?

The Active, Emotional and Context-Dependent Nature of Research Utilisation

The third point emerging from this project concerns the active, emotional and context-dependent nature of research use. The stories told by the practitioners in this project were far from straightforward accounts of reading, making sense of, and making use of research ideas.

Research use is a process that can evoke strong feelings and involve challenging emotions. This is well illustrated by the accounts of the two secondary school teachers, Lara and Jim. Both these teachers were interested in the same research about students’ misunderstandings of global environmental issues. What is interesting, though, is how the same research triggered very different emotional responses for these two participants. For Lara, the idea that young people have poor understandings of global environmental issues gave her ‘*a feeling of guilt*’ as a teacher, and was something that she ‘*doubted*’ and ‘*wanted to test*’. For Jim, meanwhile, this research was something that he agreed with, and that reassured him he was ‘*not alone*’. In other words, it was not just his students who had difficulties distinguishing between the greenhouse effect and ozone layer depletion. These contrasting emotional responses had implications for the ways in which Jim and Lara then sought to use the research in their schools.

As well as being an emotional process, research use was also influenced by individuals' professional situations and interests. Differences were evident, for example, in relation to participants':

- ♦ **institutional contexts** – There were quite clear differences between the kinds of research ideas that interested the participants from secondary schools (global environmental issues teaching), primary schools (parental involvement, school grounds projects and curriculum planning) and community/field centres (ways of working with schools and accuracy of ideas conveyed).
- ♦ **socio-economic contexts** – The two participants from an inner London borough, for example, were facing different kinds of challenges in developing ESD (such as competing priorities, lack of LEA support, little parental involvement) compared to those from more rural/suburban settings where issues of parental involvement were less of a concern but the need for rewriting schemes of work was much more pressing. These differences were reflected in the kinds of research and uses of research that interested these practitioners.

Another interesting source of variation was the extent to which the use of the research was an individual process or an institutional process. There were examples of both. Probably the most individual were the two secondary school teachers who both focused on their own classroom practices: *'In what ways could I challenge and develop students' conceptualisations of these issues?'*; *'It gave me a feeling of guilt'*. This was less marked with two of primary school teachers, Celia and Sandra, who both spoke collectively about how *'We could justify our desire to develop the curriculum'* and *'The research us pointed us towards various criteria which we must address'*. The same was true of Julia, who, as head of education at an outdoor centre, sought to involve her whole team in the hope that *'This would have a real and immediate impact on what we do and how we do it'*.

These points highlight the personal and professional challenges involved in engaging with research as an educational practitioner. More consideration needs to be given to the kinds of support that researchers and others can provide to practitioners seeking to undertake such work.

5. Conclusions and Implications

This paper has provided some brief glimpses into the processes and complexities of practitioners seeking to make use of research in environmental education. It is important to remember that these glimpses come from a small, one-year project, and so can yield no more than tentative insights into the interface between environmental education research and environmental education practice. That said, I would argue that the stories and experiences generated by this project provide some useful ideas and possible starting points for further work in this area.

In particular, this paper suggests that:

- ◆ research *can* be useful to environmental education practitioners, in terms of providing support, raising challenges, stimulating reflection, promoting further enquiry, and initiating change
- ◆ researchers need to recognise that the process of using research is neither simple nor straightforward, but is likely to be shaped by practitioners' professional roles, responsibilities and contexts, and can be the subject of strong personal emotions and feelings
- ◆ practitioners need to be aware that while they may approach research with a desire for easy answers about effective practice, it is more likely that research will be useful to them in ways that are conceptual and symbolic, rather instrumental
- ◆ both researchers and practitioners need to realise that (i) their conceptions of research utilisation may differ and this will present challenges for forging connections between their work, and (ii) connecting with practice means connecting not only with people's actions but also with their thoughts, ideas and feelings.

Most importantly, this paper challenges simplistic notions of research dissemination, and moves the question of research utilisation into wider debates about professional learning, research-engaged schools, pedagogical change and collaborative inquiry. It suggests a need for a great deal more empirical investigation and theoretical reflection not only about questions of how and for whom research might be useful, but also about the conceptions of research use that are implicit in the answers to these questions. In other words, it is not enough for researchers to get better at communicating their findings and suggesting implications. We need to learn how to work with others to develop better shared understandings of what these findings and implications mean in different practical and conceptual contexts.

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APPENDIX 1: EXAMPLE OF A PRACTITIONER CASE STUDY

CASE STUDY 3: USING RESEARCH TO INFORM THE DEVELOPMENT OF A WASTE ACTION PROJECT IN A PRIMARY SCHOOL

The Practitioner

My name is Sandra McLeod, and I am the humanities/ESD, school grounds and community involvement coordinator at Shacklewell Primary School in Hackney, London. For the past five years, while teaching at this inner city primary school, we have tried, with varying degrees of success, to raise awareness of issues of sustainability among pupils, staff, parents and the wider community.

We have found, however, that although we may make some impression through projects such as building a high profile recycling centre, lobbying the council, holding open days and developing sustainable projects in the school grounds, we do not appear to influence attitudes enough to significantly change the environmental behaviours of children, parents or even staff.

Ideas from Research

Having read the research, particularly those parts which refer to the teaching and learning of ESD in inner city areas, some of the reasons for our lack of influence became more apparent. Initially, and perhaps most significantly, research findings confirm that, for various reasons, there is less concern for the environment among inner city children than in other areas. For example:

'Roper Starch Worldwide's (1994) survey of young people in the US found that concern about the environment relative to other social issues was significantly greater among the students from non-disadvantaged areas' (p.253)

We also found confirmation of our belief/experience that many inhabitants of disadvantaged areas are more likely to be concerned about local environmental issues, such as litter and pollution than about global environmental issues.

On a more positive note, the review confirmed that 'studies of intergenerational influence suggest that students, after participating in environmental education activities, are capable of influencing the environmental attitudes and/or behaviours of their parents' (p. 289). An added proviso, though, asserted that:

'Such influence, however, is not an automatic process, and appears to be facilitated by programmes being enjoyable for students, including tasks which can involve parents and dealing with actual local problems, in addition to students and parents having an interest in the environment and good communication patterns.' (p.289)

Connections to Practice

Our school recycling scheme has recently not been as successful as it might have been. This is due partly to council cut-backs and partly to a decline in interest and momentum within the school community. We had considered an in-school approach to reviving interest and motivation, but were then given the opportunity to become part of a high-profile national scheme, Schools Waste Action Club run by WasteWatch.

This project promises to 'deliver a real reduction in waste produced' through active teaching and learning opportunities. By maintaining a high profile for the project through newsletters, presentations, events and photo opportunities, it will seek to involve and work closely with the wider school community to 'raise awareness and understanding of waste management issues'. We expect the project to run during the current academic year.

The research has pointed us toward various criteria which we must address in order to make the project, as well as the teaching and learning of ESD, successful and worthwhile. These are:

- ◆ waste management issues should be introduced through local concerns such as litter and its disposal, in order to engage the interest of the whole school community
- ◆ teaching and learning must be active, challenging and enjoyable, so that pupils are sufficiently motivated to pass on their knowledge and behaviours to others, particularly parents
- ◆ communication between the school and the wider community about the project must be encouraged, through newsletters being translated into various first languages and news/activities being made available to those unable to come into school regularly.

The importance of these criteria has been borne out by our recent experience of trying to interest parents in contributing ideas for our quiet/cultural garden. After almost no response to an invitation to have refreshments in the garden after school, we decided to hold the consultations as part of a two-day programme of celebrations of each particular culture. The first ones we held were 'Nigerian Days', when we invited in parents and cultural groups to give the children experience of artwork, music, cookery, storytelling, etc.. These days were a great success with many parents from all cultures coming, and suggesting many interesting ideas for indigenous Nigerian plants and artefacts.

This experience confirms the findings of the research which indicated that parents from inner-city environments are more likely to become involved in environmental/development (ESD) issues when they originate from issues which are of personal interest/concern to them. Following on from this success, we intend to hold more 'cultural days' with garden consultation sessions and a 'multicultural' day to celebrate the school's 30th birthday later this year, when we shall also take the opportunity to promote ESD issues.

Issues for Consideration

In conclusion, I feel that the research has and will be valuable to me, in that:

- ◆ it supports my beliefs and provides justification for the teaching of ESD in schools such as ours
- ◆ it has made me more aware of the issues which need to be addressed in order to make the teaching of ESD successful in an inner city environment.

Notes

¹ Very briefly, Wittrock's (1991) eight models of interaction between social knowledge and public policy are: (i) enlightenment, (ii) engineering, (iii) technocratic, (iv) classical bureaucratic, (v) policy-learning, (vi) adversary, (vii) dispositional, and (viii) social-problem-solving.

² Hammersley (2000:43) identifies two version of the enlightenment model: 'strong enlightenment' (which implies that 'policy makers and practitioners are normally in the dark, and research is needed to provide the light for them to see what they are doing, and/or what they ought to be doing') and 'moderate enlightenment' (where 'the role that research plays in practice is more limited, and depends on practical judgements [by the research users]'). The Enlightenment model presented in Table 1 refers to the latter i.e. 'moderate enlightenment'.

³ Following a curriculum review in 1999, the prominence of environmental topics in the National Curriculum of England has been enhanced. Under the term 'education for sustainable development', one of the stated aims of this new curriculum document is to: 'develop [pupils'] awareness and understanding of, and respect for, the environments in which they live, and secure their commitment to sustainable development at a personal, local, national and global level' (QCA, 1999:11).

⁴ All quotes from the practitioner case studies are presented in italics. These may include quotes taken from the original research review, and this is indicated by page references to Rickinson (2001).