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On the danger of blurring methods, methodologies and ideologies in environmental education research

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Introduction

When deciding what to cook, there are certain questions to be borne in mind including: who the meal is for; what food is available; and what cooking utensils and equipment one has. Other, more individual factors, include personal tastes, diet and philosophies. As a vegetarian, for example, Justin is not going to be cooking meat; Arjen who does occasionally eat meat, might. One of us likes spicy food, the other does not. Likewise, as people over the age of 40 'watching our weight', we both try to avoid consuming too many 'calories'. So, our end product, the meal, depends on a range of factors over which we have no control (what's available); a range of factors over which we have some control (depending on our personal choice); and a range of beliefs and preferences that reduce our choices. Usually research is more complicated but, in essence, this analogy serves to remind us that the final product—the substance of our conclusions—also depends on factors over which we have no control, factors over which we have some control, and a range of beliefs and preferences that reduce our choices in designing, conducting and reporting research. What people think of our meal/research conclusions depends largely on them and their preferences and persuasions: there's nothing intrinsic to either the cooking/research process that guarantees what someone will think about its end product in terms of quality, suitability, choices or compromises.

In this contribution, we would like to caution against blurring methods, methodologies and ideologies in research. We do this by drawing on two earlier articles in *Environmental Education Research* that focused on this issue as well but from quite different vantage points: Hart's (2000) paper in which he problematizes the generating of generic guidelines for designing and judging different strands of research, and

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Connell's (1997) paper in which she suggests that a plurality of methodologies and multi-paradigm research appear more fruitful, provided that the mixing is done with a thorough understanding of the social, political and philosophical contexts of the research.

From our own experience of reviewing published work (see Dillon *et al.*, 2003; Corcoran *et al.*, 2004; Rickinson *et al.*, 2004) and articles submitted to environmental education research journals, we note that many authors do not pay much attention to some aspects of research that some—including the authors of our two focus articles, Hart and Connell—value as essential. We shall discuss a series of confusions that seem particularly persistent, and conclude by calling for both a more cautious use of language, and a better examination and articulation of methodology in research. Such examination would need to include a discussion of the ontological, epistemological and axiological underpinnings of a methodology.

Methods and methodology

One of the most confusing developments in educational research over the past quarter-century has been the proliferation of epistemologies—beliefs about what counts as knowledge in the field of education, what is evidence of a claim and what counts as a warrant for that evidence. (Pallas, 2001, p. 6)

We start with a recurring confusion present in the mixing up of methods and methodology. Methodological considerations involve examining positionings and tensions in research ontologies, epistemologies and axiologies. Ontology looks at what we're dealing with (the *what*)—the nature of reality—are we 'researching', for instance, people's knowledge, attitudes, the words people use, the number of books in a school library, or how long people spend looking at an exhibit? Epistemology refers to how we make knowledge (the *how*)—for example, do we look for patterns and themes in what people say in answer to our questions, do we give people tests, or do we watch what people do and infer their thoughts from their actions? Axiology relates to ethical considerations and our own philosophical viewpoints (the *why*)—such as, do we take a positivistic stance, use feminist epistemologies, involve participants as researchers?

Less-experienced researchers might be more open to consider and reconsider their methodological approaches than more established academics. As Pallas (2001) has noted, this issue is particularly crucial to less-experienced researchers, given that as participants in a complex field, we are all faced with an increasing diversity of positions and philosophies in one's reading and at conferences, and while we are invited to engage them in our work situations and networks through ongoing debate and dialogue, we must all demonstrate sound reason and judgement in choosing which to attend to.

If environmental education researchers want to develop a community of reflective scholars, we need to look more closely at the whole range of available epistemologies, ontologies and axiologies, and appreciate them not in some relativistic sense because they are there, but because they offer different perspectives. By appreciating them all, we do not mean using them all. To continue the food analogy, when at an 'all you can eat' buffet we need to show some restraint and combine with some care in order to

have a decent meal. One of Hart's (2000) points, with which we wholeheartedly agree, is that the unwitting or thoughtless mixing of methodologies can be an indicator of a poor understanding of what research entails.

Part of the confusion over methodologies and methods has arisen because of commonly articulated misunderstandings in the literature around the use of the terms qualitative and quantitative. We regard methods as the tools or instruments used for data *generation* or *collection* (for example, questionnaires, audio-taped interviews, focus groups or texts from chatroom exchanges), or data *analysis* (frequency counts, thematic coding, inferences, and so forth). Note here that we are separating methods of production from the processes to which data are subjected in methods of analysis. Examples of this confusion can be found in published environmental education research papers. Chatzifotiou, for instance, after introducing the semi-structured interview as her key *methodology*, writes 'the *overarching method* was *qualitative* because every teacher possesses a distinct idea of what environmental education is and what practice entails' (Chatzifotiou, 2005, p. 507; our emphasis). These are not research paradigms or approaches, although it is common to find the phrases 'qualitative/quantitative research/method' in papers. Yet, a questionnaire can include open-ended and closed questions—the issue of whether it is qualitative or quantitative is meaningless. If we choose to count the number of people who choose 'very strongly' as a response to a question then we are analysing the data in a quantitative manner; if we code people's responses to open-ended questions then we are analysing the data in a qualitative way. But we could alternatively count the words in responses to open-ended questions and present the data in a quantitative manner. So, the notion that questionnaires are exclusively a quantitative research method represents a misunderstanding of basic ideas, while embracing a qualitative—quantitative binary is not very helpful in improving that understanding.

Methodology and ideology

Perhaps it is potentially more fruitful to move to the level of methodologies and their corresponding ideological partners. Returning to the papers of Connell and Hart, Connell's purpose was 'to contribute to methodological discourse about research approaches to environmental education ... as a way of opening opportunities for diverse pathways of research in environmental education' (Connell, 1997, p. 117). Hart's stated purpose was to 'overcome some confusion about qualitative studies within environmental education research' (Hart, 2000, p. 37). Both authors have much in common but see the world through different lenses. At one level, they both observe a distinctive shift in educational research and a growing acceptance of alternative methodological approaches within it. However, the subtle differences in wording between the two authors seem to indicate significantly different philosophical stances. Whereas Hart sees research itself as shifting, Connell sees a new 'alternative' approach to research coming into existence.

Either way, it is clear from looking back over 10 years of *Environmental Education Research* that the field continues to be a broad though sometimes divided 'church'

with its own complement of agnostics and atheists. Following some groundbreaking debate initiated in the early 1990s (Mrazek, 1993; Robottom & Hart, 1993), many environmental education scholars have become familiar with the existence of a range of different views about doing research. The emergence, since then, of new research journals that are more open to different approaches to, and ways of thinking about, research than was the case with existing outlets (for example, until then the *Journal of Environmental Education*), illustrates the shifts observed by both Hart and Connell. Similarly, at a recent pre-conference research symposium at the 2005 annual conference of the North American Association for Environmental Education, it was evident that more and more people have come to appreciate the important differences in perspectives between the many research approaches that we now find.

One value in republishing these two focus articles is to illustrate that the arguments that the writers made are still valid. Hart argues that the debates about methodologies have helped researchers to identify and state their positions and assumptions, which, in turn, has helped other researchers. Hart's underlying premise is that researchers should 'appreciate the independent and interrelated roles of ontology, epistemology and methodology in rendering more transparent these issues' (Hart, 2000, p. 38). We agree with Hart's deprecation of the 'academic sectarianism ... as reflected in superficial dialogues about method and simplistic debates about essentially related schools of thought' (p. 38), and his objection to reducing (i.e., non-positivistic) research to a single mode of inquiry. For him:

... the range of qualitative approaches, from ethnography and phenomenology, through various participatory forms of inquiry as well as feminist and postmodern approaches, is too complex and varied in philosophy and history to be represented as a unified or even a coherent field. (Hart, 2000, p. 38)

We broadly support his conclusions, but not his notion that ethnography and phenomenology can be adequately termed 'qualitative approaches'. They may well be, but do not *have* to be.

Robottom and Hart (1993) have also argued that different ontologies and associated epistemologies have very definite implications for methodologies and methods which must not be ignored by field researchers if high quality research is to be carried out. The point, for Hart, is:

... not to accommodate or reconcile multiple paradigms of educational thought but to recognize them as unique, historically situated forms of insight which require reconciliation not at the paradigm level but at the level of meta-paradigms—for example, whether people can agree on the relationship of education to the goals and ideals of democracy and social justice. (Hart, 2000, p. 38)

Hart refers to the paradigmatic and ideological underpinnings of research which require critical reflection and explication as they have serious consequences for the methodologies available and the ability to blend methodologies. One could argue that it is the questions posed that determine the methodology and that it should not be the other way around. But, the kinds of questions we ask, the purpose for asking them in the first place, how we ask them, to whom we ask them (and whom we exclude), how

we value people’s responses, how we relate to those who partake in a study, who is to benefit from the study, and so on, are worldview-laden. In Table 1 we present three purposefully simplified representations of approaches to environmental education research to illustrate three different ways of conceptualising research. There are, of course, other ways of doing this but we present these three to show the need for articulating purpose, roles, relationship with those who are part of the research, and, more generally, assumptions about the role of science in society.

Pluralism in educational research: some considerations

Both authors of the focus articles address issues pertinent to the purpose of research and to ways in which researchers engage with problems. Whereas Hart regretted the ‘academic sectarianism’ reflected in ‘superficial dialogues about method and simplistic debates’ (p. 38), Connell objects to Robottom and Hart’s ‘antagonistic attitude’ (Connell, 1997, p. 118) towards an empirical–analytical methodology. Connell summarises three arguments that she says characterise the common descriptions of the empirical–analytical methodology and the associated post-positivist ideology. Having set out the arguments, Connell then asks if they are justified. Just as Hart points to the different paradigms within, in his terms, qualitative research, one of Connell’s key points is that there are two paradigms within the empirical–analytical methodology—traditional positivist and post-positivist. Although it can be argued that even though post-positivist approaches are more aware of bias, subjectivity, assumptions with regards to the nature and value-ladenness of scientific knowledge,

Table 1. Three simplified representations of environmental education research

	Research as evidence	Research as co-learning	Research as activism
Modus of understanding	Empirical analytical	Hermeneutic–interpretive Holistic–descriptive	Socially-critical
Locus of impact	Universal	Trans-contextual	Contextual-transformative
Key research competencies	Good tester, designer and modeller	Good listener, interpreter and storyteller	Good ally, critical friend, advocate
Main researcher modes	Passively-detached Neutral expert objective	Actively-detached Passively-engaged Explicitly-biased	Actively-committed Explicitly-partisan
Role of the researched	Source of data	Active informant Co-learner	Change agent Co-learner
Desired outcomes include	Explanatory models, Tests of hypotheses Definitive answers	Improved understandings Thick descriptions Increased (self) awareness	Transformation (Systemic) change

they still embrace traditional empirical–analytical values and assumptions (Phillips & Burbules, 2000). In the light of Hart’s appeal, above, that researchers value ontology, epistemology and methodology, it is worth noting that Connell uses ontology, epistemology and methodology as lenses to examine the different paradigms. But this is clearly a problem if ontology and epistemology are both key aspects of methodology.

What both Hart and Connell do particularly well is to argue that different research paradigms deserve respect and need to be better understood by more members of the research community than currently seems the case. But whereas Hart argues that we are ‘between stories’ in educational research and that, for the present, ‘we are left to cobble together our stories to help us and others understand how and what we did ...’ (2000, p. 44), Connell, presciently, notes with affirmation the call by other researchers for an ‘associated community of researchers ... where not all researchers do all kinds of research but all do what they do well ...’ (1997, p. 30).

Connell concludes her piece by suggesting that the emerging binaries in the literature may ‘distract researchers from considering more enlightening complementary and cooperative dialogues about research methodologies in environmental education’ (p. 129). However, a look at the contents of *Environmental Education Research* from 1998–2005, in particular, its special issues, would indicate that her understandable worry was unfounded. Connell also points out the growing number of researchers promoting multi-paradigm research, a trend that seems common across social science research. Our question is whether this can be done when the ideological underpinnings of various research methodologies are so different.

Writing more recently on a related topic, Johnson and Onwuegbuzie seem to have no trouble blending methodologies which, incidentally, they refer to as methods. They argue that ‘mixed methods’ research is a ‘research paradigm whose time has come’ (2004, p. 14), pointing out that the qualitative/quantitative debate has been going on for more than a century (‘ardent dispute’ is how they describe it). Arguing against the purists on both sides of the argument who advocate the ‘incompatibility thesis’ between the qualitative and quantitative (see Howe, 1988), Johnson and Onwuegbuzie claim that what they recognise as the ‘qualitative and quantitative research paradigms, including their associated methods’ (*ibid.*) can and should be mixed. In this way, the authors posit mixed methods research as a third paradigm. Johnson and Onwuegbuzie contend that ‘researchers and research methodologists need to be asking when each research methodology is most helpful and when and how they should be mixed or combined in their research studies’ (2004, p. 15). They argue that ‘many (or most?) qualitative and quantitative researchers (that is, post-positivists) have now reached basic agreement on several major points of earlier philosophical disagreement such as the theory-laden perception or the theory-ladenness of facts’ and ‘the social nature of the research enterprise’ (2004, p. 16).

At this point, we note that Martyn Hammersley provides a useful perspective on divergence and convergence in social science research methodology. He asks whether the amount of pluralism in educational research ought to be applauded or whether it poses barriers to progress in educational research itself and to its playing a worthwhile

role in policy and practice (Hammersley, 2004). He distinguishes two camps in answering the question. One side, which in all likelihood includes many of the mixed methods proponents, argues that there is a need for methodological consensus building in order to be able to construct a cumulative body of knowledge that can more effectively inform policy and practice. Others argue that attempts to do so will lead to a reimposition of a positivist paradigm, and that this will undercut much valuable research (Hammersley, 2004). Hammersley suggests that the 'evidence-based' trends in health research but also in educational research embody such a reimposition. In answering the question he finds himself somewhere in the middle:

I don't think that any simple bringing-together of all the various methodological trends that have developed, can be engineered, or even brought about through enlightenment. Indeed, some of these trends seem to me so obviously antithetical to the very nature of research that they cannot be tolerated. ... Nevertheless, there is a need for more effort on the part of social and educational researchers to build bridges between different kinds of work and to see how they might be usefully combined or integrated. ... [However] complete consensus would not be a good thing; some difference and diversity is always necessary in order to stimulate further development. (Hammersley, 2004, pp. 8–9)

Johnson and Onwuegbuzie argue that 'mixed methods research should ... use a method and philosophy that attempt to fit together the insights provided by qualitative and quantitative research into a workable solution' (p. 16). They go on to advocate the use of pragmatism as the philosophical partner of mixed methods research. By this they mean that the answer to the question 'how should research approaches be mixed?' is, pragmatically, 'in ways that offer the best opportunities for answering important research questions'. This answer begs the question of who decides what the 'best opportunities' are? Mixed methods, they argue, is 'a movement that moves past the paradigm wars by offering a logical and practical alternative'. The authors argue that what is 'most fundamental is the research question' and that 'research methods should follow research questions in a way that offers the best chance to obtain useful answers' (pp. 17–18). While, in his classic book, *Against methods*, Paul Feyerabend takes this even further by suggesting that science should be an anarchistic enterprise and that theoretical anarchism is more humanitarian and more likely to encourage progress than its law-and-order alternatives (Feyerabend, 1975).

Paul Hart is not arguing for anarchy or even the liberal blending of methods and/or methodologies tailored to each specific research question. Instead he stresses the need for a 'well-articulated methodological strategy':

Qualitative researchers need more than a methods toolkit; they need a well-articulated methodological strategy, capable of arguing epistemological and ontological positions and responding within a particular system of inquiry. (Hart, 2000, p. 42)

What is particularly interesting to note here is that Hart recognises that researchers operate within particular systems of inquiry. He suggests that researchers articulate and argue their strategies and positions from *within* their specific vantage point. We agree but at the same time note that many researchers don't, or are perhaps not too worried about this issue. Having looked closely at the nine research articles published in the last available issue of *Environmental Education Research* at the time of writing

Table 2. Overview of self-reported methodologies and methods used in EER 11(5)

Paper	Methodology	Methods
Jurin and Hutchinson	Grounded-theory	Ecological autobiographies
Chatzifotiou	<i>Not specified</i>	Semi-structured interview questions 'qualitative'
Mueller-Worster and Abrams	Phenomenology and grounded theory	Focused life-history interviews Details of experience interviews Multiple observations Informal interviews Document analysis
Moore	Feminist epistemology Participatory action research	Active participation Interviews Document analysis Observation Critical friend
Ekborg	<i>Not specified</i>	Questionnaires Semi-structured interviews
Tal	<i>Not specified</i>	Pre- and post short answer questionnaires Analysis of students' work Semi-structured interviews
Brody	Learning in nature theory	Case study Content analysis (of notes, writings and drawings)
Summers, Childs and Corney	<i>Not specified</i>	Questionnaires (partly open, partly closed)
Banks, Elser and Saltz	<i>Not specified</i>	Pre- and post-surveys (Likert-scale) <i>Post hoc</i> survey (Likert-scale) Open questions

this contribution (Volume 11(5)), we note that there a wide range of methodologies and methods used by the various researchers. The volume illustrates that the landscape of research methods and methodologies employed in environmental education has become far more diverse. Nonetheless, some authors do not articulate their methodology. In fact, none of the authors who could be positioned in a more empirical–analytical end of the spectrum do this; rather they limit themselves to presenting their methods (Table 2).

A good discussion of methodology requires the articulating and arguing of one's vantage point, the recognition of other vantage points, and clarifying why one vantage point was preferred to others. Admittedly, this will be no easy task for, as Hart states:

... the range of qualitative approaches, from ethnography and phenomenology, through various participatory forms of inquiry as well as feminist and postmodern approaches, is too complex and varied in philosophy and history to be represented as a unified or even a coherent field. (Hart, 2000, p. 38)

As noted earlier we are uncomfortable with the qualitative–quantitative divide, but we imagine the same points can be made at the quantitative end of the spectrum.

Like Hart, Connell too seems to have problems with the pragmatic, needs-based, contingency approach, as advocated by Johnson and Onwuegbuzie. Although happy with the idea of ‘methodologies ... selected to meet clearly identified research needs’ (1997, p. 130), she sees those needs as being ‘balanced with a clear understanding of the social, political and philosophical contexts in which the techniques are located’.

Looking ahead

So, are we any nearer to overcoming some of the ‘confusion about qualitative studies within environmental education research’ (Hart, 2000, p. 37)? *Does* mixed methods research, for example, offer us a new methodological paradigm – a third way to do research? The answer to these questions, we suspect, is ‘it depends’. As Pallas (2001, p. 7) argues, meaning ‘arises from two complementary purposes’, participation and reification. In essence, participation is the process that communities (social, cultural or geographical) use to share and develop ideas and meaning (see also Lave & Wenger, 1991). Reification is the social consolidation of that meaning. So, in an academic research group, participation takes place during presentations, seminar discussions, shared reading, notifying each other of useful references or online resources. Reification occurs through the production of papers, websites and posters, and so forth, which are engaged with through participation.

If educational researchers cannot understand and engage with one another, both within and across at least some educational communities, progress in research and its potential contribution to policy and practice will be hampered. To prevent a recurring pattern of epistemological single-mindedness, educational researchers will need to engage with multiple epistemological perspectives to the point that members of different communities of educational research practice can understand one another, despite, or perhaps through, their differences (Pallas, 2001, p. 7).

In order to move forward we need to start seeing ourselves as members of a community of reflective scholars, and not just as aggregates of individuals, or as competing camps, or as a pluralistic field of multiple unconnected research paradigms without common interests. In order to move in that direction, we need to consider the view that environmental education research, as a member of the broad family of educational research:

... [has] empirical, interpretive, and normative dimensions; that there now are and can in the future be developed public and rational ways to make warranted knowledge claims in each of these dimensions; ... and that we should open-mindedly presume the goodwill and intelligence of each other as researchers until proven otherwise. (Soltis, 2004, p. 9)

Soltis makes another important point we wholeheartedly support which is that open-mindedness is not the same as empty mindedness. It is not the same as tolerance of all views, but rather it requires a sincere attempt to consider the value of other views and their underlying claims. It does not release us from our duty as critical scholars to exercise judgment.

So, the challenge for new researchers (and for those who advise, supervise and support them) in doing research, is to appreciate the value of a broader range of

methodologies or at least not dismiss some out of hand. At the same time, however, we argue that researchers will need to resist being drawn into mixing methodologies however pragmatically useful or convenient this may seem. Whatever methodologies are chosen, researchers will need to consider the ontological, epistemological and axiological ramifications of such an approach. At the same time inquiry should be driven by questions, not by preferred methods or even methodologies.

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