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Research Paradigms in Environmental Education: Post War Reconciliation?

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Methodological self-reflection is an aspect of research rigour. Yet the “politics of method” perspective has been slow to take hold in North American environmental education. While arguments have been made concerning the need for deliberation about and congruence among the political theories of substance and method, polarisation of quantitative and qualitative researchers has tended to persist. This presentation provides an outline of the issues arising at a recent forum which aimed to transcend this polarisation of research in environmental education.

Introduction

The field of research in environmental education in North America has tended to be dominated by quantitative approaches to research, with behaviouristic, quasi-experimental designs being the most visible in the Journal of Environmental Education. Methodological rigour has usually been associated with characteristics of pre-ordinate, applied science research designs. Methodological self-reflection in the form of critical deliberation about the philosophical congruence among different approaches to research and differing substantive research questions seems to have been much slower to take hold than in related fields like research in science education. The idea of the “politics of method” — that research is itself political, with distinctive epistemological, ontological and ideological assumptions — was largely absent prior to the annual conference of the North American Association for Environmental Education (NAAEE) at San Antonio, Texas in 1990 (see Mrazek 1993).

In the past seven years or so, there have been varying challenges to the positivist grip on research in environmental education, with the scene unfortunately marked more by persistent polarisation than remedial rapprochement.

However, a day-long workshop at the recent annual conference of the NAAEE promised to take a step towards reconciliation, and gave rise to deeper understanding of some of the research paradigm issues at stake in the field of research in environmental education. This presentation will outline some of these issues.

Context

The workshop involved some thirty delegates from twelve different countries, with the USA and Canada the most strongly represented. The aim of the research workshop was to seek to establish a set of research guidelines that transcended the polarised debate between “quantitative” and “qualitative” research and which could be said simply to define “good research” of any kind. The stated intention was to begin this task without reference to the vigorous recent discussions about the relative merits and adequacy of alternative paradigms of research. The assumption of the session was that judgments about what represents
“good research” and “bad research” can be made without reference to deeper philosophical issues — that distinctions between good and bad method were independent of methodology.

A. Introductory Section

1. Are the research problems, or findings unduly influenced by the researchers’ institutional affiliations, beliefs, values, or theoretical orientation?
2. Do the researchers demonstrate undue positive or negative bias in describing the subject of the study (an instructional method, program, curriculum, person, etc)?
3. Is the literature review section of the report sufficiently comprehensive? Does it include studies known to be relevant to the problem?
4. Is each variable in the study clearly defined?
5. Is the measure of each variable consistent with how the variable was defined?
6. Are hypotheses, questions, or objectives explicitly stated, and if so, are they clear?
7. Do the researchers make a convincing case that a research hypothesis, question, or objective was important to study?

B. Research Procedures

1. Did the sampling procedures produce a sample that is representative of an identifiable population or of a local population?
2. Did the researchers form subgroups to increase understanding of the phenomena being studied?
3. Is each measure in the study sufficiently valid for its intended purpose?
4. Is each measure in the study sufficiently reliable for its intended purpose?
5. Is each measure appropriate for the sample?
6. Were the research procedures appropriate and clearly stated so others could replicate them if they wished?

C. Data Analysis

1. Were appropriate statistical techniques used, and were they used correctly?

D. Discussion of Findings/Results

1. Do the findings or results of the data analyses support what the researchers conclude are the findings of the study?
2. Did the researchers provide reasonable explanations of the findings/results?
3. Did the researchers draw reasonable implications for practice from their findings/results?

Figure 1: Guidelines for conducting and reporting quantitative environmental education research, in Marcinkowski, 1993

In terms of process, the workshop began with the tabling of two sets of criteria — one seeking to describe quantitative research (Figure 1) and one seeking to describe qualitative research (Figure 2). The irony was that these two tabled sets of criteria were drawn from an article (Marcinkowski 1993) prepared for the San Antonio conference workshop in 1990 — an article that pre-dated the subsequent rise in interest in the “politics of method”
(see for example Robottom & Hart 1993). And it was quickly recognised that both sets of criteria were authored by an avowed quantitative researcher! Subsequently, most of the discussion for the day was actually concerned with re-developing the set of qualitative criteria (Figure 2) into a form (Figure 3) more acceptable to workshop participants.

An account of some of the issues that arose in the six-hour ensuing discussion follows.

A. Introductory Section
1. Are the research problems, procedures, or findings unduly influenced by the researcher’s institutional affiliations, beliefs, values, or theoretical orientation?
2. Do the researchers demonstrate undue positive or negative bias in describing the subject of the study (an instructional method, program, curriculum, person, etc.)?
3. Is the literature review section of the report sufficiently comprehensive? Does it include studies known to be relevant to the problem?

B. Research Procedures
1. Did the sampling procedure result in a case or cases that were particularly interesting and from which much could be learned about the phenomenon of interest?
2. Were there sufficient intensity of data collection?
3. Is each measure in the study sufficiently valid for its intended purpose?
4. Is each measure in the study sufficiently reliable for its intended purpose?
5. Is each measure appropriate for the sample?
6. Were the research procedures appropriate and clearly stated so others could replicate them if they wished?

C. Research Findings/Results
1. Did the report include thick description that brought life to how the individuals responded to interview questions or how they behaved?
2. Did each variable in the study emerge in a meaningful way from the data?
3. Are there clearly stated hypotheses or questions? And do they emerge from the data that were collected?
4. Were appropriate statistical techniques used, and were they used correctly?

D. Discussion of Findings/Results
1. Were multiple sources of evidence used to support the researchers’ conclusions?
2. Did the researchers provide reasonable explanations of the findings?
3. Was the generalizability of the findings appropriately qualified?
4. Did the researchers draw reasonable implications for practice from their findings?

Figure 2: Guidelines for conducting and reporting qualitative environmental education research, in Marcinkowski (1993)

Characterising Qualitative Methodology: Some Issues in Environmental Education

The approach I will adopt is to consider some of the issues in terms of which Figure 2 (the original characterisation of qualitative research) was translated into Figure 3 (the characterisation of qualitative research generated in the workshop).
A. Introductory Section. Most of the discussion about this section focused on the subjectivity/objectivity issue in qualitative research. There was concern with the pejorative tone placed on the role of values in research. Items 1 and 2 in Figure 2 imply that any influence (emanating from researcher’s or institution’s biographies or contexts) on aspects of the research (at the problem statement, procedural or findings statement moments of the research) is in some sense unwanted and to be avoided. The pejorative tone in reference to the effect of such values is indicative of an interest in objectivity of person and process in qualitative research.

A. Introductory Section
1. Has the researcher adequately described how the research problems, procedures, or outcomes were shaped by her/his institutional affiliations, beliefs, values, or theoretical orientation?
2. Is the literature cited relevant and sufficiently representative?

B. Research Procedures
1. Was the choice of cases or research participants appropriate for the intended research?
2. Was there sufficient depth of data collection?
3. Has the researcher(s) adequately ensured credibility and trustworthiness of the data?
4. Is the context of the research (e.g. historical, cultural, etc.) adequately described?
5. Has the researcher(s) adequately described the rationale for the selection of the specific research procedure?
6. Has the researcher(s) adequately addressed the ethical considerations related to the research purpose?

C. Research Outcomes
1. Did the researcher(s) provide sufficiently detailed information about the data to permit interpretation?
2. Has the researcher(s) adequately described the relationship between the data and the outcomes?
3. Has the research adequately described the evolving relationship between the emerging research questions and data?
4. Were the appropriate data analysis techniques used and were they described adequately?

D. Discussion
1. Has the researcher(s) offered a reasonable interpretation of the outcomes?
2. Did the researcher(s) draw reasonable implications of the outcomes for the research participants or other audiences?

E. General
1. Did the researcher(s) demonstrate consistency between A1 and the research design, data collection, and interpretation?

Figure 3: Guidelines to Non-Positivistic Research — developed by participants in the research workshop of the Annual conference of the North American Association for Environmental Education, Vancouver BC, Canada, August 1997
The alternative statement developed by the workshop group is predicated on an interest in the acknowledgment and declaration of personal and procedural subjectivity in qualitative research hence the criterion, “Has the researcher(s) adequately described how the research problems, procedures, or outcomes were shaped by her/his institutional affiliations, beliefs, values, or theoretical orientation”. In this statement, an attempt was made to acknowledge without prejudice the role of values on the (personal and social) construction of research. A second issue in this section related to the nature of the literature review. The implication in Figure 2 is that the capacity of the author to review adequately the literature should be established in a separate Literature Review section. The intention in Figure 3 was to retain the imperative of reviewing the literature, but to acknowledge that this could be achieved throughout the narrative account of the entire research report.

B. Research Procedures. The main issue in the section on qualitative research procedures was the extensive use of language and concepts drawn from and relating to the procedures of quantitative research. Terms and concepts such as sampling procedure, measurement, validity, reliability, and replication have specific and appropriate meaning within a context of quantitative, experimental or quasi-experimental research, but in placing environmental education research within an applied science discourse they serve only to mislead and distort non-experimental interpretive and critical approaches to research. At stake here are completely different views about gaining purchase on an aspect of social life (quantitative measurement vis-a-vis descriptive understanding). The working group was interested in replacing positivist notions of validity, reliability, generalisability and replicability with post-positivist ideas of contextuality, credibility and trustworthiness. Above all, the working group was interested in pointing to the importance of making a deliberative choice about methods — one based on the perceived relationship of method to stated research questions as well as the historical and cultural context of the research. Also the absence of any statement referring to the ethics of research in Figure 2 was a concern rectified in Figure 3.

C. Research Findings/Results. Again, the language used in this section of Figure 2 is indicative of applied science approaches to research, with the idea of variables emerging from the data and the primacy ascribed to statistical techniques rather than other data collection methods perhaps more applicable in non-applied science research. The emphasis on statistical techniques implies an interest in fixed pre-ordinate research design; the workshop group ensured that Figure 3 included an item acknowledging the evolving relationship between data collection methods, emerging data, and the study’s research questions.

D. Discussion of Findings/Results. Concerns expressed here included the realist tone of the term “findings”, and the apparent commitment to generalising from specific findings, a notion at odds with the contextuality of much qualitative research settings. The “contextuality” characteristic is referred to in item B4 of the revised set of criteria in Figure 3. Item 4 received criticism for its instrumentalist notion of the process of research as producing findings which have implications for practice; the idea that research might proceed through a more interactive relationship of theory and practice is absent from this statement (and it remains absent in Figure 3!).

The final item in the revised set of criteria is based on the view that research in environmental education ought to be internally coherent — that an attempt is made to ensure that the philosophical (epistemological, ontological, ideological) assumptions of the
adopted research methodology are consistent with the philosophical characteristics of the environmental education topic or program being researched.

Conclusion

This workshop was an interesting experience for a number of reasons. In an environmental education association noted for the strength of the positivist turn of its research traditions, the mere existence of the full day workshop aimed at deliberation on criteria for appraising research was an encouraging sign for research in the field. Of interest was its intent to begin discussions with dated documents purporting to provide a profile of quantitative and qualitative research respectively, both of which were prepared by a leader in the positivist/quantitative genre of research. In the event, the aim of creating a single unified set of criteria describing both qualitative and quantitative approaches to research without engaging deeper philosophical distinctions between these approaches was soon exposed as unworkable. Researchers from Mexico, South Africa, England and Australia were prominent in arguing against the feasibility of this original aim.

Issues to arise in subsequent discussion concerned ontological, epistemological, ideological and ethical considerations. The discussion itself was of interest and value to all involved, and possibly of more value than the outcome statement purporting to characterise qualitative research.

The task of defining research, and making distinctions between different approaches to research, is well worth pursuing, not least because it bears on the issue of "gate keeping" in the field. The NAAEE's Journal of Environmental Education is an important forum for publication of research in North America, and it has long demonstrated an attitude of apparent preference for quantitative research. The (unstated) editorial policy of the journal seems to be that if research does not comply with the characteristics of quantitative research, then it does not qualify as research at all. This policy appears to be weakening, and the development of an adequate set of criteria for appraising qualitative research might well be an important step in the direction of a more balanced policy relating to the publication of research in environmental education.

References


