

# The Teaching and Learning of Environmental Education in N.S.W. Primary Schools: A Case Study

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## **Introduction**

The aim of the doctoral study outlined in this paper is to contribute to the improvement of teaching and learning of environmental education. The significance of environmental education as a strategy to address environmental problems has been documented widely in Australia and overseas. This study shows that as a strategy to solve such problems its success so far has been questionable.

The study assumes that there is a problem in the teaching and learning of environmental education and that the policy document, *Environmental Education Curriculum Statement K-12* (New South Wales Department of Education, 1989) has not been adequately implemented.

## **The problem**

Curriculum documents and policy statements have been produced in response to a perceived need to educate people about environmental issues. Ostensibly, the aim of policy makers, or those who make decisions about educational policy, is to bring about behavioural change that will lead to an improved environment. However, there is a dearth of research which determines: whether, in fact, environmental education is taught in schools; how it is taught; its place in teacher preparation and professional development; the constraints in implementing environmental programs in schools; and the effectiveness of these programs.

## **The research story**

I offer two research projects which give some indication about the place of environmental education in the New South Wales (N.S.W.) school education. The first was Phipps's unpublished honours thesis (1991). In Phipps's study she claims that a third of the teachers had not implemented the mandatory document *Environmental Education Curriculum Statement K-12* (N.S.W. Department of Education, 1989). She adds that only three percent of the teachers surveyed felt thoroughly prepared to teach environmental education. Phipps makes links between this lack of preparation and the provision of preservice education and professional development. The outcomes of her study point to the conclusion that while environmental education is increasingly incorporated in teacher

education there is still room for a great deal of improvement and at present there is little evidence in the schools which reflects the changes in teacher education.

Secondly, the N.S.W. Quality Assurance Directorate has conducted a review of environmental education in N.S.W. The following findings were reported to the Ministerial Advisory Council on Environmental Education (MACEE) by Dr Ken Boston (25-7-94), the N.S.W. Director General of Education:

- environmental education is being implemented primarily in the Science and Technology and Human Society and Its Environment Key Learning Areas;
- the teaching of environmental education is characterised by the teaching of knowledge about the environment and skills in environmental activities; the action component occurs much less frequently;
- some schools are providing quality environmental programs while others are not;
- the implementation of environmental education is directly related to the presence of interested teachers;
- content consists principally of the natural environment and waste management;
- there is little integration of environmental education across the curriculum; and
- although Field Studies Centres are seen as an excellent resource teachers are unhappy with the availability of other resources such as print material.

The Quality Assurance review is based on the premise that environmental education should include an action component. The presence of action, that is the *for* the environment dimension of environmental education, is used as a criterion to judge the quality of environmental education programs.

The research cited above suggests that the problem of incorporating environmental education in the N.S.W. school curriculum has not been solved and that the quality and standard of the teaching of environmental education in schools is inadequate.

### **Why is this so?**

My explanation of why the quality and standard of environmental education is inadequate is informed by my own research study. It is a qualitative study, conducted in two phases. The first phase investigates the Environmental Education subject offered to teacher education students and experienced teachers at the University of Technology, Sydney. The second phase comprises case studies of environmental education in four primary schools in the Sydney region.

In the second phase key teachers, whom I refer to as 'practitioners', sought to improve the teaching and learning of environmental education

in their respective schools. Their common aim to improve the implementation of environmental education in the school curriculum was later articulated as problems.

I draw principally on Robinson's work on what she calls 'Problem-Based Methodology' (PBM) (1993). Robinson is concerned with a need to find agreement between the problems identified by practitioners and the solutions selected. Robinson explains that practitioners frequently need to choose between several possible solutions and the criteria used to judge between solutions may change over time. Educational problems are solved when the outcome is satisfactory for all those who have a shared interest in the problem. A problem-based methodology is an important theory of interpretation and implementation in environmental education because it gives us the means to solve problems that are important in our field. The research tells us that to date we have been largely unsuccessful in solving a problem that is crucial to environmental educators: how environmental education can be successfully implemented in the school curriculum.

The concept of touchstone is also explored in conjunction with a problem-based methodology. Here, (following the work of Lakatos, 1970) we are not concerned with identifying one best theory among competing theories to resolve differences, instead we look to those areas of actual or potential agreement between competing theories for the measure of our theoretical preference, for our touchstone. Drawing on the work of Walker (1985) and Walker and Evers (1982) I use touchstone analysis as a strategy to provide practitioners with solutions to their professional problems.

My concern in environmental education is that the problems have been described but not solved. It is, for example, common practice in environmental education research to present case studies of exemplary practice. The case studies highlight the problems of implementing environmental education for those whose constraints do not provide the opportunities to model exemplary practice. For most practitioners the problem is simply described but not solved.

In the study outlined in this paper my aim is to solve the problems of implementing environmental education in schools. My focus is practitioners in schools and their theories of teaching and learning. I also consider practitioners' constraint structure or, in other words, the setting in which they practice. This includes: organisational structures; the physical setting; and practitioners' own beliefs and values.

A problem-based approach has been useful in identifying both practitioners' theories about environmental education and the constraint structure in which they practice. My study included: practitioners who believed they were successfully implementing environmental education; others who were frustrated by their attempts to bring environmental education to their schools; and some who knew little about environmental

education and, by their own account, were not including it in their classroom curriculum. Collectively their stories tell about the place of environmental education in their curriculum.

Practitioners talk about the constraints of implementing environmental education including time, crowded curriculum, other priorities, lack of professional development, discipline problems etc., however, constraints need not be viewed negatively. Consider, for example, the emphasis on quality education. Surely a quality education would include strategies which would lead to a sustained or improved environment. I am saying that rather than use the constraint structure as an explanation of why environmental education is not being implemented in schools it would be pragmatic to work out strategies that take advantage of the constraint structure.

The issue is that the problems of implementing environmental education have been described but not solved. The desired changes are not happening in schools and while it may be appropriate for educational researchers to critique problems it is also necessary to solve practitioners' problems. Theories held by some educational researchers fall short of social action and this is because schools are structured in such a way that they cannot accommodate progressive social change. A practical theory is required which takes account of practitioners' constraint structure.

### **A solution**

A solution needs to incorporate four dimensions of school education: practice, curriculum, policy and teacher education. All four dimensions are inextricably linked.

#### *Practice*

Significant issues relating to practice in primary schools emerged in this study. These issues not only inform the learning and teaching of environmental education but importantly inform practice in primary schools. Included are issues related to: practitioners': confidence; unilateralism; theories of learners seeing themselves as learners: colleagues; theories of environmental education; school management; and community involvement in schooling. It is not my plan to discuss all of these issues here. Instead I focus on practitioners' unilateral control of situations, their confidence and their theories of environmental education.

I explained earlier that the key practitioners in each of the case studies had a shared goal of environmental improvement. Each attempted to introduce strategies in their respective schools that would lead to this desired change. In three of the four cases the practitioners, by their own account, failed. The common theme was that they attempted to make the changes single-handed, expecting support for their endeavours and yet not openly inviting others to be a part of the process. They held a belief that their goal of environmental improvement, and associated strategies, were

incontestable. In other words, they took **unilateral control** of each of their projects. Robinson (1993, pp. 60-61) in reference to Argyris, Putnam and McLain Smith (1985) explains that:

unilateral control involves masterminding situations, whether from benevolent or malevolent intent, by taking control over goals, over how to involve others, over how to gather and interpret relevant information, and over how to manage people's feelings.

A key issue here is **practitioners' confidence**. This study showed that practitioners were not confident: in their knowledge about environmental education; in their ability to question the dominant theories in environmental education; in their ability to question and change prevailing conditions in their schools, in their ability to make decisions about their curriculum which cohered with their theories of teaching and learning; and in their own ability to learn.

There were clear incoherencies between practitioners' theories of teaching and learning and their **theories of environmental education**. For many, environmental education is a field that requires specialist knowledge. Moreover, it requires practitioners to reconceptualise their curriculum and question prevailing practices. I am saying that environmental education does not cohere, in many cases, with practitioners' theories of teaching and learning. One could speculate that practitioners should revise their theories of teaching and learning so that they cohere with theories of environmental education. A theory of change is required if this is to happen.

It is the *for* the environment, or the action component, which both differentiates environmental education from other curriculum areas and also requires teachers to revise their theories of teaching and learning. The issue I am raising is: what do we mean by 'action'? Perhaps if we redefined action in such a way that the definition cohered with practitioners' theories of teaching and learning, and took account of their constraint structure, they would be more inclined to include environmental education in their classroom curriculum.

### *Curriculum*

Strategies to incorporate environmental education in the school curriculum have, to date, included approaches such as integrated, interdisciplinary and separate subject. Thematic approaches include integration and interdisciplinary strategies. However, attempts to incorporate environmental education in the school curriculum have been largely unsuccessful.

The practitioners in this study spoke of a 'crowded curriculum' and referred to the school as being 'busy'. They also spoke of a hierarchical curriculum—English and Mathematics were given higher priorities than

environmental education, for example. The crowded curriculum and curriculum prioritising arguments were offered as constraints on the implementation of environmental education. They were, in some cases, seen to be part of the same issue—curriculum prioritising being a response to the crowded curriculum.

Another issue which emerged was the status of interdisciplinary studies such as environmental education. The strategies to incorporate environmental education as an interdisciplinary study ranged from giving it a clear place in one Key Learning Area (KLA), to treating it incidentally.

The problem is that none of the implementation strategies listed above include a theory of subject disciplines (which are represented as KLAs in N.S.W.) and the theory sets which comprise these disciplines. Each discipline has a set of theories consisting of epistemologies and pedagogies which make that discipline distinctive from another discipline. While there has been some attempt to identify the theory set which comprises the field, environmental education (see, for example, AEC 1991), there has been no attempt to identify how that theory set coheres and differs from the theory sets of the subject disciplines. A difference, for example, may be the action component of environmental education.

The problem occurs when differences are identified. In other words the epistemologies and pedagogies that are distinctive to interdisciplinary studies such as environmental education but are incoherent with the theory sets of the subject disciplines. Practitioners are left with the dilemma of revising their theory sets in each of the subject disciplines or revising their theory set of environmental education so that it coheres with the theory sets of the subject disciplines and practitioners' theories of teaching and learning. I argue that it was the latter strategy that was most frequently adopted with the practitioners involved in my study.

If an effective implementation strategy is to be devised it is important to consider practitioners' constraint structure. In the situation where a subject-based curriculum exists, as was the situation in each of the case studies described in my study, the subject-based curriculum becomes the constraint structure. If the constraint structure cannot be changed then practitioners need to be able to solve the problem of how to implement interdisciplinary studies such as environmental education in their curriculum. I argue that this can be achieved by identifying common ground, or in other words, the coherences between the theory sets of the subject disciplines and those of the interdisciplinary studies such as environmental education.

### *Policy*

It is a policy of the N.S.W. Department of School Education that environmental education is mandatory in all state schools. The evidence

suggests that this is not occurring. If we accept that educational policy has the potential to cause change in schools we must look at the relationship between policy and practice.

Consider that policy is an espoused theory or what I refer to as an 'spoused policy' and the implementation of policy is a 'theory-in-use' or what could be called a 'policy-in-use'. An espoused policy is not necessarily implemented in schools whereas a policy-in-use is implemented. The situation then, in N.S.W., is that environmental education is an espoused policy of the Department of School Education but not a policy-in-use. If it was a policy-in-use certain conditions would be established to ensure that environmental education would be taught in schools.

We need to consider how environmental education could become a policy-in-use. I suggest that certain conditions must exist for an espoused policy to be a policy-in-use. If a policy requires a theory of change, that is, if practitioners are required to change their practice then an implementation theory must be developed. This may be done at systemic or practitioner levels. If policy makers do not supply the school with an implementation theory then policy will become a policy-in-use only if the principal or another member of staff has a theory of change which accommodates the new policy. In other words they need to take action to bring about the required changes.

Policy developed at systemic level has the potential to bring about significant changes—witness, for example, the implementation of national profiles. If the decision was made that environmental education would be implemented in schools strategies would be devised to ensure that this happened—professional development would be provided, resources produced, school-based policies would be developed, significant groups such as parents and unions would be convinced that the policy was in the best interests of schools, teachers would have to account for their teaching of environmental education and students' progress would be reported to parents.

Policy is a powerful strategy to bring about an improvement in the teaching and learning of environmental education. However, if policy is going to be effective, and not merely developed to placate interest groups such as environmental lobbyists, it needs to be accompanied by an implementation strategy.

### *Teacher education*

My study provided me with the opportunity to reflect on my own practice as a teacher educator in environmental education. The time spent with practitioners in schools, and specifically those that had completed my subject led me to revise my theories about my teaching.

I found that I needed to be able to provide opportunities for my students to reflect on their own theories of practice. They need to examine



their theories of teaching and learning in relation to environmental education. It is also essential that they identify the constraint structure of teaching.

A teacher development program or preservice teacher education course needs to provide opportunities for practitioners and prospective practitioners to identify agreements and disagreements between competing theories. Discussions with and between practitioners can be used as a basis for review and revision of personal theories of teaching and learning. Practitioners need to identify the most coherent alternative theory that will result in a solution to the problem. They also need to be aware of their constraint structure, including policy, and how this may be accommodated or altered to solve their problems. In the instance of environmental education, it is the theories of environmental education in the context of theories of teaching and learning that need to be explored.

In practical terms I use a problem-based approach which incorporates an action research model—that is, the identification of a problem, investigation of the problem and the development of a plan to solve the problem. In this approach I provide the opportunity for my students to consider their theories of teaching and learning and how these cohere or are different from the theories of the people involved in the action research project. I also ask them to identify their constraint structure. They need to consider whether the constraint structure needs to be changed if they are to solve the problem they have identified and, if this is not possible, how they can alter their strategies to accommodate the constraint structure.

## **Conclusion**

The problem of how to incorporate environmental education in the school curriculum is not being solved. Clearly the strategies used to date need to be revisited. Instead of providing a critique of the education systems that have the potential to educate young people in a manner that will lead to a sustained or improved environment we need to find common ground in those systems. To do this we need a critical analysis of the field 'environmental education'. The theory set that determines the field needs to be identified and, I argue, reconceptualised in a manner that takes account of constraint structure. A shared vision of environmental improvement is required—the task for us as educators is to develop practical strategies which allow us to have a shared vision. This needs to occur in a manner that accommodates for the diversity of theories of teaching and learning, and environment, by those that influence practice.

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