

## **Researching a Whole-Year EE Program: Some Methodological Issues**

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**Abstract** A P-12 school in regional Victoria has an environmental theme throughout its Year Four program with classes located in a purpose-built Environmental Centre in a separate location within the school's grounds. We report here on a one-year case study of the grade four thematic integrated curriculum at the school. We reflect on and describe some of the methodological issues that arose during the interviews, direct observations, photography and video-recording. Some of the practical considerations associated with case-study methodology will be discussed. The paper concludes with a summary of emerging substantive issues and a prospective view to further research.

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### **Introduction**

Towards the end of 2000, the Faculty of Education at Deakin University was contacted by the principal of a large independent school in the Geelong area, inviting staff to research the school's Year 4 Enviro Program. The school has an environmental theme throughout its Year Four program with classes located in a purpose-built environmental centre in a separate location within the grounds.

As a small research team interested in environmental education and integrated curriculum, we undertook a one-year case study of the thematic integrated curriculum at Year 4 at the school, gathering data to describe the program and illuminate this distinctive approach to primary teaching and learning. The perspectives of teachers, students, administrators and parents were sought. The purpose of the research was two-fold. Firstly, we documented the program across the year thus highlighting several issues to be considered for further research. We explored the structures, relationships and content of the program and the people involved. This entailed engagement of the interpretive categories of the social, educational and environmental values, beliefs and attitudes of the main participants. Secondly, we wished to study, in particular, how the teachers integrated both science and mathematics into the Enviro Year.

Since this represented an interpretive study of a system that was "bounded" in both time and space, we identified case study as the most appropriate methodology for its capacity to accommodate the complexity of this classroom situation as it actively engages the changing dynamics of the classroom and its social settings (Campbell 2000). Additionally we recognised the validity of Stake's (1994, p. 245) assertion that

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"The utility of case research to practitioners and policy makers is in its extension of experience"; and that case study centres on "... research on a single case with a view to revealing important features about its nature" (Bryman, 2001, p. 55). These considerations were found to be compatible with our own purposes in the project.

We gathered data through interviewing, direct observation, participation in staff meetings, the use of photography and video recording to develop a number of interpretive accounts of aspects of the program. In addition, we used the approach of iterative reporting back to the primary audience of the program in order to improve the validity of the accounts.

### Choosing our Methodological Approach

In our preliminary discussions about the proposed project we decided that a participatory case study approach would be most appropriate as our basic intention was to seek to describe and develop an understanding of an educational program rather than for the research to be an active agent in evaluating or changing the program. Stake (2000, p. 437) has called this an *intrinsic case study* as "it is undertaken because, first and last, the researcher wants better understanding of this particular case".

The setting investigated is a "bounded system" in a number of ways. From the physical perspective, it is located as a dedicated area within the school and the buildings have been specifically designed with the program in mind. The children are isolated from the mainstream school buildings and are provided with their own unique "uniform" for the duration of the year. A specific time frame of one year (2002) was used for the case study - this being the term that students stay within the program. The curriculum is developed for this year so that it is integrated fully around and within the environment. Specialist areas are moved as much as possible so as not to infringe on the program. Sport has been reduced over this year, but is extended the following year, in year five. In addition, the program has its own "budget", separate from the other areas, to allow flexibility and to ensure that resources are available when needed. Also the teachers and children involved are positioned exclusively within this setting, with the other stakeholders being parents and the school leadership team.

In determining the methodology, we took the following words of Stake (1988) which point to the value of case study methodology in such circumstances.

The case study focuses on a bounded system, whether a single actor, a single classroom, a single institution, or a single enterprise - usually under natural conditions - so as to understand it in its own habitat. ... It is a complex dynamic system. We want to understand its complexity. (Stake, in Jaeger, 1988 p. 256)

Clearly the system we investigated encompassed a range of educational, social and personal elements that were inextricably linked and formed the focus for the investigation. The research methodology needed to be sensitive to the constraints and opportunities that presented within the research project. McTaggart (1987, p. 7) states that case study "is sensitive to particular contexts" and "could provide a better knowledge of educational phenomena in general". Rob Walker (1980) has defined case study as:

The study of particular incidents and events, and the selective collection of information on biography, personality, intentions and values, all of which allows the case study worker to capture and portray the elements of a situation that give it meaning (p. 4).

Our intention was to document and explore the structures, relationships, motivations and content of the program and people involved. Stake (2000) discusses how researchers "... aim the inquiry toward understanding what is important

about that case within its own world ...” He then describes the development of the interpretations of issues and contexts as “*thick descriptions*” (Stake, 2000, p. 439).

We used a number of different data collection methods to study the social, educational and environmental values, beliefs and attitudes of the main participants, and to develop our own “thick descriptions”. (Stake, 2000, p. 439). We have reflected on the data, providing our interpretation of the events, the participants and the context of this case study. Through this we hoped to “describe the cases in sufficient descriptive narrative so that readers can vicariously experience these happenings and draw conclusions (which may differ from those of the researchers)” (Stake, 2000, p. 439). Discussion of the developing issues can be found further into this paper.

### Methods-in-Practice

In all approaches to qualitative evaluation, there are two essential questions for this design process. First, what is the empirical unknown in this situation? That is, what do the folks here want to find out that is different from what they already know? Second, what is the best procedure for generating that information? That is, what constellation of methods will produce the kinds of information that will address these questions and concerns? (Pitman & Maxwell, 1992, p. 761)

All field work was undertaken by the investigators, most often with two researchers or the entire team visiting the school. To some extent the relatively close proximity of the school to the university facilitated this way of operating. However, more importantly this ensured that each researcher maintained a close connection with the design and progress of the research as it unfolded.

According to Robson (2002, p.183),

An important feature of case study is that if more than one investigator is involved, they take on essentially similar roles. The tasks cannot be reduced to rigid formulae ... All the investigators need an intelligent appreciation of what they are doing, and why. Hence it is highly desirable that all are involved in the first stages of conceptualization and definition of the research questions. Similarly, they should all be involved in the development of the case study plan.

The research team also felt the need to gather the perspectives of all stakeholders in the Enviro program. Accordingly the research embraced the two key teachers, the children in the program, the parents of the children, other teachers in the primary section of the school (this being a P-12 school), the Junior School Principal, and the School Principal. General group discussions and participant observation were deemed to be useful starting points for the research process. Dahlberg, Drew & Nystrom (2001, p. 175), claim that:

... one must first understand that culture in all its complexity ... Participant observation provides an interior perspective where one can see and come to understand phenomena in their natural setting. Interviewing teachers gives us a sense of the classroom milieu. But by observing the actual interaction, in the moment, ... we are privy to information that may never have been revealed in an interview.

Therefore, it was seen to be important to gather data in various forms, thereby “capturing”, as fully as possible, the essence and nature of the Enviro program. The forms of data collection included:

- Audio-taped (and at times video recorded) discussions/interviews with all stakeholders;
- Still images and video capture of the Enviro program in action;
- Images/samples of children's work;
- Collection of various documentation relating to the program; and
- Casual observational visits to the setting during class time.

These approaches resulted in a large amount of varied information about the program from a range of perspectives. After reviewing the data collected in these ways, we framed questions following up both points raised by participants in the program and issues emerging from our interpretation of the data; these questions then formed the basis of later interviews. This process conferred an iterative quality to the research process and provided some degree of continuity to successive data collection visits to the school.

### **Methodological Issues**

Our understanding of a number of emerging methodological issues is informed largely by practical experience in the project, so the treatment of them here is expressed in terms connected with the particular context within which the project was conducted.

#### *The Selective Nature of Field Work*

Quite clearly many decisions about the conduct of the field work were made during the course of the project. As highlighted by Dahlberg, Drew & Nystrom (2001, p. 173),

A fieldworker does not know immediately exactly what should be studied, because within any field there are countless phenomena to be considered. It is only after some time in the field that interesting and relevant questions can be formed ...

Choices and selections about the "who, what, when, where and how" of data collection impact critically on research outcomes, and yet are often rather arbitrary and the basis for them ill defined. Again, Dahlberg, Drew & Nystrom (2001, p. 173), discuss this point and come to the conclusion that:

Data do not exist "out there in reality", for the researcher to gather in as if picking flowers. Instead, the field the researcher observes and describes becomes data when the researcher notes something as interesting and for that reason observes and describes it.

In this project the decisions were largely made by the researchers and based on a range of factors including: the researchers' preconceptions about research, and specifically about conducting research in a school setting; the researchers' conceptions of the educational/social culture of the school; practical considerations for the researchers; and a sense of what was "reasonable" from the teachers', school's and parents' perspectives.

#### *Some Dilemmas of Data Collection*

In general the methods chosen for data collection and the way in which they were implemented worked well. There was a high level of cooperation by the school and all participants, and a willingness to accommodate most requests or arrangements that were proposed. Thus, a large amount of data was gathered – which is frequently the case in this kind of research.

The discussions with stakeholders were particularly useful in providing insights into the Enviro program, though a dilemma presented itself when “interviewees” digressed from direct answers to questions posed and embarked on more broad ranging conversation. Should the discussion be left to follow its own course, perhaps revealing something pertinent along the way and providing unexpected insights? Or should it be reined in, in order to remain “on track”? In this case, as often happens, some flexibility was practised and then the discussion brought back to plan.

Though they provide a rich and substantial resource, the audio-taped interviews also presented a dilemma. Their very extensiveness forced decisions about what was to be kept/transcribed/accessed for the project and what was to be archived or discarded. In this case a research assistant initially transcribed entire tapes. However, it was soon realised that, given a limited budget, this would be unsustainable and in any case, not necessarily useful. Therefore, it was decided that the team would need to exercise some judgment in deciding what material was pertinent to the research rather than peripheral to it.

Some difficulties also were presented by intensive, but infrequent periods of video-recording in an educational setting. In such circumstances both children and teachers can initially have the sense that there is a need to “perform” or showcase particular things, even though this might not be the intention of the researcher. On one occasion, when the events of an entire morning were to be recorded, supposedly as they usually occur, the teachers frequently asked of the researcher: “What would you like us to do now?” It was necessary to emphasise that the aim was to record a “normal morning” without any special adjustments or arrangements. Similarly, the children, who generally created a busy hive of activity when carrying out the outside tasks, become quiet and measured in their interactions when the camera was in use. This difficulty was overcome as time passed.

### *Participants’ Preconceptions About the Nature of Research*

Participatory interpretive research by definition involves the collaboration of research partners in as many of the phases of the research as possible. However, different participants come from different backgrounds, and the two teachers in this project came with different perspectives. Neither had been involved in research before, they had no experience on which to base their expectations and in the first instance came across as being equivocal about involvement in the research (Campbell, Herbert & Robottom, 2001). Added to this was the fact that the whole research initiative was spearheaded by the School Principal, which might explain their early hesitancy about their expected involvement. In our experience, it is not wise to assume that participants come to any project with a unitary “default” construction of what counts as research in environmental education. Some participants approach a project with the expectation that the research is of an “accountability exercise” kind, in which university-based researchers seek to measure the achievements of other participants against a given set of criteria, perhaps independently-existing and externally-derived. The very word “research” often evokes the assumption of the employment of quantitative applied-science research designs.

Before preliminary discussions with the teachers involved in the project occurred, it may well have been their assumption that the Year Four Program, and their roles as classroom teachers, were to be *evaluated* through the research project undertaken by Deakin researchers. Their understandings of “research” were not clear in the first meeting and, as with any meeting of relative strangers, there was an interchange of ideas as familiarity was developed and credentials and intentions established. It is important to recognise the possibility of these prior assumptions about the nature

of research and to engage participants directly very early on in project discussions, and for the evolving methodology-in-action to be the subject of open and continuing negotiation. This is one of the reasons why it usually takes time to build a research culture within any new project.

With this in mind, we engaged the teachers in a general discussion about our understanding of our roles as researchers and asked for their expectations of us. We negotiated the terms of our involvement, and theirs, both in the frequency of, and in the time taken for interviews and other plans for data collection. In our initial proposal to the teachers, we used the term “case study” and defined it simply as a means to describe the program and their integrated thematic approach to primary teaching and learning. Over the term of the project, we negotiated access to the children and the parents – in all instances being aware of our intrusion into their classrooms and the extra demands we were placing on them. In the early stages of the project, one of the researchers attended the classroom regularly to assist with the outdoor activities and to establish a rapport with the children and teachers.

### *Capturing and Representing Meaning*

The methodology and methods chosen for this research serve to gather information about the structure and activities of the program, providing a clear sense of these tangible aspects. Nevertheless, as recognised by Stake (2000, p. 244), “with much qualitative work, case study research shares an intense interest in personal views and circumstances”. Therefore, the issue arises as to how these less tangible elements (values, assumptions, beliefs, philosophies, etc.) that underpin the program can be captured and represented in a way that provides an authentic and reasonably complete representation of the deeper meanings. This point was made by the key teachers in our final discussion, where they wondered about how effectively the program could be represented to those who did not have first hand experience of it.

At one point we asked the teachers, “Is there anything ... that you would want us to explore or perhaps represent that we may have missed so far?” The responses of both teachers homed in very directly on the issue of what they saw as a key challenge for us all. How well could we show all the complexities of the program - and different forms of success and meaning attributed to the program by the teachers and other participants? The quotations below (from an interview on 28/11/2002) encapsulate these concerns as well as providing further insights into the meaning and connections that they hold.

I don't know whether the way in which the place is structured, the way in which it all works, I'm not sure ... people come in and we tell them what we're doing ... but I'm not sure that it is easily understood ... even by educators ... It takes a long time to understand the balance ... I think it is a really complex thing that almost happened by accident but works really well and is really hard to see ... (JP).

I agree ... you remember that group of teachers from X, who were interested and came to have a look ... and all they could see were the problems and the this and the that ... and I just don't think that by coming in ... I don't know how you get it across ... (WD).

You see we actually value what we do and that doesn't always happen when you teach. Sometimes we are required to teach something that is alien to all of us ... (WD).

One of the things is faith in what you are doing. Faith that what the kids experience and what you are trying to give them is good — I know it's not bad

... but in some ways there's a lot of immeasurable stuff. Writing reports about Enviro is not about how many facts they've learnt. (JP)

This seemed to touch squarely on a central and recurring issue for those involved in participatory, interpretive research in social (educational) settings. It is not difficult technically to gain a representation of the surface levels of structure and activity. For example, we have developed a multi-media version of our case study that provides a partial portrayal of the bounded system under study. What is much more difficult is capturing and representing the deeper subjective meanings that participants attach to these surface levels of structure and activity, and in terms of which they make them intelligible. In their comments above, the teachers were expressing a concern that we felt ourselves: how do we do justice to these subjective interpretive categories?

There are two stages in addressing this concern. Firstly, researchers themselves should attempt to engage these deeper meanings. In this regard various measures can be adopted through which we can deepen our understanding of the program and therefore more adequately represent what we have come to understand. These include:

- utilising a broad range of data collection methods and including all stakeholders in the process;
- engaging research that connects with a setting over an extended period;
- direct involvement of researchers in the data collection, compilation and analysis; and
- undertaking informal visits and becoming involved in the program at various levels.

The second stage, that of seeking to more fully represent the program not only in terms of infrastructure and program design but at deeper levels conveying perceptions of the faith, the values and the vision, is perhaps an even greater challenge. An important consideration here is that the participants themselves hold these keys and therefore need to be given the opportunity to express the meanings in their own ways.

### *Substantive Issues*

It is not our intention in this paper, which concentrates mainly on methodological issues, to deal in any depth with emerging substantive issues associated with the Enviro Year itself. However, it is appropriate to simply present a summary of some of these substantive issues, in order to provide the reader with some idea of the methodology-in-context. The following is a summary of some of the issues we encountered in constructing this case study of a whole-year environmental education program – the Enviro Year. We are only outlining these issues here, but will be elaborating on them in future publications on this project.

- The importance of a broad-base of within-school support: the supportive, complementary relationship between the two teachers linked most directly to the program; the vision and intellectual and monetary assistance of the principal; and the cooperation of colleagues and parents. In particular, it is difficult to see how the Enviro Year program of off-site activities could be managed without at least the current level of participation of supportive parents.
- Within the context of long-term planning, this importance of within-school support is a double-edged sword: the experience of similar programs elsewhere has shown that once one or more of the committed individuals central to the success of the programs departs, the program tends to have a short life.

- The program as a model for innovation: the experience of the “whole-year theme” approach enacted in the Enviro Year is being used as a template for the introduction of other significant curriculum developments within the school.
- The importance of values in environmental education: the teachers’ environmental and social values have shaped the program and provided an enduring reference structure for imagining and enacting developments within the program.
- The Enviro Year and environmental education: the program clearly enacts forms of environmental education that relate to “education *about* the environment” and “education *in* the environment”; does it have an interest in or capacity for the perhaps more demanding “education *for* the environment”?
- Program diversity and interdisciplinarity: the program presents a wide range of inside, outside and off-site activities that relate to the Enviro theme to a much greater extent than they relate to traditional disciplinary structures. The advantage of this is that students gain a holistic perspective on the environment, collaborative learning and meaningful tasks. On the other hand, attention to traditional disciplines is generally less overt, and at times the balance between disciplinary and thematic expectations is called into question.
- Outdoor activities and safety: any outdoor activities raise safety considerations. It is interesting to see how the children participating in the Enviro Year respond to this.
- The distinctiveness of the Enviro Year: the Enviro Year is high on identity – different uniform, different teachers, different location, and different curriculum organisation. What impact does this have on the program and its participants?
- Politicisation of the curriculum: environmental education has an interest in engaging environmental issues in the community – issues which are usually fundamentally political. This has the potential to lead to a politicisation of the curriculum, posing dilemmas for both teachers and students.
- The response of the school in providing for students who have deeper understandings of the environment: how does the school monitor ongoing levels of understanding and implement new programs to cater for children who have undergone this program?
- The marketability of the program: is there a risk that the higher profile given to this particular year as a draw card for new students will result in any compromise or unexpected pressures on the teachers or children?
- The long term prospect: will the program survive and flourish in the long term, or is it an innovation born of and dependent on a transitory social climate, sustained by interests that wax and wane in a relatively short period?

## Conclusion

This paper presents some methodological issues associated with the conduct of a participatory case study of a whole year environmental education program at a local primary school. Case study as an approach to interpretive research in environmental education has been around for a long time. In some senses the methodological debate about alternative approaches to research has moved on at a meta-theoretical level. Claims are being made about “bringing new approaches to the field” of environmental education without the articulation of what these new approaches to research might entail in terms of practice. However, at the level of methodology-in-practice much work remains to be done in experiencing, identifying and researching exigencies and issues in real-life research project contexts. Sturman (1999, p. 103 ) states that:



the distinguishing feature of case study is the belief that human systems develop a characteristic wholeness or integrity and are not a loose collection of traits. As a consequence of this belief, ... requires an in-depth investigation of the interdependencies of parts and of patterns that emerge.

Therefore, one of the challenges is that of fully representing the program not only in terms of infrastructure and program design and activity, but also at the deeper levels conveying the faith, beliefs, the values and the vision of program participants as well as the ways in which these elements are constantly revisited and renegotiated between the them. An important consideration is that the participants themselves hold these keys and therefore need to be given the opportunity to express the meanings in their own ways.

In terms of future directions, the research is now focussing on the issues related to the embedded learning within the context of a thematic, integrated approach. Despite many case studies of integrated curricula (Czerniak, Weber Jnr, Sandmann & Ahern, 1999), thematic curricula (Mason, 1996) and environmental education (Rickinson 2001), there is a lack of evidence of the establishment of discipline specific concepts (Czerniak et al., 1999). Whilst "few empirical studies exist to support the notion that an integrated curriculum is any better than a well-designed traditional curriculum" (Czerniak et al., 1999), other researchers state that "... students in integrated programs do as well as, or better than, students in single subject curricular structures ..." (Venville, Wallace, Rennie & Malone, 2000). One direction of the research is the investigation of conceptual development in mathematics and science with a view to assessing the findings in relation to the debates about the value of either a thematic or an integrated approach to curriculum delivery. Another interesting issue is that of internal evaluation of the program as a basis for decision-making concerning continuing institutional support.

**Keywords:** environmental education research; case study; methodology; whole-year EE, integrated curriculum.

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