Chapter 18
More than a Sign on the Fence? Teacher Learning and the Reef Guardian Schools Programme in Tropical Australia

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1. Introduction

The context for the research described here is teacher learning through the Reef Guardian Schools Programme (RGSP) in three diverse primary schools in Far North Queensland. The RGSP is a unique sustainability education programme developed by the Great Barrier Reef Marine Parks Authority and hosted in over 190 Queensland schools. The programme encourages schools to commit to the protection and conservation of the World Heritage listed Great Barrier Reef by changing school and community practices. The purpose of this research was to examine whether as a consequence of participating in the programme teachers are:

a) Thinking differently, and
b) Acting differently

The purpose of this paper is to illuminate teacher learning through the programme using data collected from interviews with the research participant teachers. The research itself was carried out as part of a Bachelor of Education Honours degree and takes its initiative from the Australian Research Institute in Education for Sustainability (ARIES) report of 2004 which states that:

> There is currently a lack of research to evaluate the actual characteristics of whole-school approaches in schools…The effects or impacts they have on students, teachers, and communities…Focused research on the characteristic and effects of whole-school approaches to environmental education would be necessary to evaluate the uptake and impact and effect of these practices for teachers, students, communities, and the environment. (Henderson and Tilbury, 2004: 31)

A review of the literature revealed no previous such studies and only a very limited amount of studies on teachers' experiences of teaching sustainability education (see Summers, Corney and Childs, 2003; Alvarez and Rogers, 2006). However, the broader literature on sustainability and education for sustainability as well as learning and teacher learning formed an important background for the research and is examined below.

Sustainability and Education for Sustainability

Sustainability or sustainable development is a multifaceted, disputed and shifting concept that even the most respected international literature has not, to date, been able to clearly define (Tilbury and Cooke, 2005). Professor Charles Hopkins, at the recent Australian Association for Environmental Education's bi-annual conference, stated that sustainable development is "the best we can come up with at the moment". Associate Professor Pierre Horwitz, at the same conference, explained that

a specific definition is not important; it is actually about individual perceptions. Nevertheless, consent appears to have been met over the inclusion of three and sometimes four tenets which make up the sustainability concept: Environmental, social, economic and political systems, which are intertwined and critical to achieving sustainability. These four sustainability tenets are a set of values which, if we are to live sustainably, we need to incorporate into our existing values framework.

Education for sustainability (EfS), also contested, seeks to inspire people to take up sustainability as an integral part of their values framework. In the schools' sector it requires teachers to take on sustainability and integrate it with collective critical and proactive skills in order to work towards meeting 'the needs of the present without compromising the ability of future generations to meet their own needs' (UNCED, 1987).

EfS has evolved from an environmental education concept which placed emphasis on raising awareness, individual knowledge and behaviour towards ecological conservation. Since then it has progressed on a continuum of growth and, similar to a tree which grows new branches and leaves that spread like an aerial mosaic, has become as complex as sustainability itself. It now advocates a systems approach which inextricably links ecological sustainability with the social, economic and political systems together with critical and participatory skills (Fien, 2001, 2004; Tilbury and Cooke, 2005).

Learning and Teachers

Literature on learning is voluminous, multifaceted and illusive (Smylie, 1995; Smith, 1983; Department of Education, Science and Training, 2003; Merriam, 2001; Mikulas, 1974; Burns, 2002; Jarvis, 2004; Knowles, Holton III and Swanson, 1998) with theories focusing on what learning is as well as how it occurs (Bruner, 2004). As humans we learn throughout our lifespan in many different ways, settings and circumstances. For example, there is formal, collective learning planned by others; informal, self initiated and self directed learning; incidental and unintentional learning which occurs as a result of everyday activities, to name a few (Smylie, 1995; Smith 1983). I propose that learning is a fairly permanent change in external and internal actions and thoughts that come about as a result of some experience. External being observable actions and internal referring to thinking, attitudinal and emotional processes (see Burns, 2002; Mikulas, 1974).

In the last decade research into teacher learning has rapidly gathered momentum in national and international education agendas alongside professional standards, teacher competence (Department of Education, Science and Training, 2003) and student outcomes (Fullan, 1993; Guskey, 2000; Leadership Group on Teacher Learning, 2003). It is more commonly known as formal professional development or professional learning. I use the term teacher learning synonymously with either term.

Although it is acknowledged that teacher learning takes many forms (Borko, 2004), research mostly concentrates on teacher learning in formal and collective contexts planned by others. Typically, these learning events are short term (workshop or conference), lack adequate follow up and feedback, are decontextualised from the teachers' normal working conditions and take a passive learning approach (Guskey, 2000). My research looks outside this framework to conceive teacher learning from

an incidental/unintentional perspective, which can similarly be conceived as learning from everyday experience (Smith, 1983; Merriam and Caffarella, 1999). Theorists, such as Dewey and Kolb, have written about connections between learning and experience (Merriam and Caffarella, 1999). And, while theories of learning from experience are somewhat different to incidental learning they hold the same principle that experience is central to learning.

2. Data Collection Methodology and Context

The data collection procedure for this research involved on-site interviewing of ten teachers from three schools with contrasting contexts. A semi-structured style was used to allow interviewees the freedom to co-construct the data (Lankshear and Knobel, 2004).

Miriwinni State Primary School, located in a small rural sugar cane farming area, is set amid a lush tropical valley surrounded by verdant and natural mountains on one side and the Great Barrier Reef on the other, both World Heritage listed. The school houses a population of around 60 to 70 students, mostly originating from a farming background.

Hambledon State Primary School is located in Edmonton, the largest suburb of Cairns. A once rural community, the area now has a mixture residential, commercial and recreational land uses. The school now supports around 930 students from a middle and low income population.

Alexandra Bay State Primary School is situated in Cape Tribulation, a World Heritage listed rural coastline area, in the larger Daintree National Park. It is set in eight hectares of lush, thick tropical unspoilt rainforest which meets natural sandy beaches with pristine clear tropical waters. It supports some 55 students, mostly originating from a tourism background.

3. Data Analysis

All interviews were fully transcribed then analysed via qualitative categorical analysis, as per Coffey and Atkinson (1996) and Lankshear and Knobel (2004), and consisted of two sets of codes: Non-emergent and emergent. The non-emergent codes were pre-set categories I had pre-conceived, whereas the emergent codes transpired directly from the data itself.

Initially, I searched the data and colour coded all instances where data matched the assigned categories, then produced a table based on the coded data. I then returned to the uncoded data and carefully examined it in order to identify what seemed to be key issues for the teachers, which led to the construction of the emergent codes. The emergent codes were then added to the compilation of non-emergent ones and the same process as before was used to code the remaining data. The validity of this process relies on the researcher's careful scrutiny. Below I present numerous and extensive quotations from teacher interviews that demonstrate how my analytical judgements are grounded in the data.

4. Findings and Discussion

Teacher Learning

Teacher learning was assessed under five pre-conceived categories: Environmental self construction prior to RGSP, environmental self construction post RGSP, teacher practices prior to RGSP, teacher practices post RGSP and self reported teacher learning.

When teachers were asked to identify their learning as a result of participation in the RGSP, most reported learning simultaneously and at the same level as the students:

> The same as the kids I guess. You're more aware of what's happening and the impact that it has on the reef and wildlife (Nina).

> When I was teaching year 6 and we were doing a unit on the Barrier Reef and protecting the reef and we looked at things like pollution and washing the car on the grass and using no detergents but actually using bi-carb soda and vinegar and that kind of thing… it's integrated into my practice now. I don't wash the car on the driveway anymore and if I can use non chemical products, I do. (Enilee).

Additional evidence that teacher learning is a part of the RGSP can be seen in the following data. If we accept the definition of learning as an observable change in actions and thoughts (Burns, 2002; Mikulas, 1974) then most teachers demonstrate changes in the way they are thinking and doing things in both their professional and personal lives:

> It has changed my perspective. I know that I was marginally interested in, you know, like it's better to look after the environment than to trash it but since we've been involved in the Reef Guardians… I think differently. When I'm looking at a plan, like a unit, I'm actually thinking in terms of how this is going to meet those needs and how we're going to cover these kinds of concepts, environmental sustainability, futures perspective, management, cultural awareness, all of those kinds of things. I'm much more influenced by my thinking now when I'm planning rather than knowledge. It's like the application of the knowledge and the application is strong in sustainability, environmental kind of thinking. I've found that when I'm planning those are the avenues that I'm pursuing which I didn't before (Enilee).

> Yes, more looking at it from a futures perspective. For example, the cigarette butts and things like that, in 10 years time, well if we do this what's it going to look like for these children? (Nina).

> You look to recycle first and then throw. (Arlene).

> I am now active in my personal life due to my awareness from school based projects. I find that I now really watch what I put down the sink - not much except water these days, instead of noodles etc. I also ALWAYS have a little ashtray with me so that I can put my cigarette butts in there and then take them home and put them in the bin. I also leave things on the beach such as

> shells, coral, wood etc instead of taking things home with me - this is hard to do but I'm really good at it now! I don't use a lot of chemicals when cleaning at home, I use microfibre cloths mostly. (Georgia).

These changes can be regarded as definite behaviour and cognitive environmental changes. However, these statements illustrate learning has only taken place within certain confines because, in each case, teachers have only assimilated or changed practices with an ease of fit. This aligns with research carried by Pruneau et al., (2006: 37), who found that "simplicity of chosen actions" is a major causal factor of environmental behaviour change. Although the teachers have extended themselves both, cognitively and behaviourally, the initial data suggests they have made changes which are comfortable and do-able.

Awareness

A key theme that emerged from all the interviews was teachers reported becoming more environmentally aware as a result of taking up the RGSP in their schools. This is a very positive result that demonstrates one of the benefits of the programme as developed by the Great Barrier Reef Marine Park Authority.

> But our awareness must have changed as a result of teaching stuff like this. I think our awareness has come through things like The Reef Guardian Programme. (Esma).

> It's just made me more aware of it so that when you are about to do something you have that extra thought of "why am I about to do this, maybe I shouldn't". That's probably more on your mind now rather than before. (Nina).

> I think I have a bigger awareness of recycling and stuff now. (Georgia).

All, except one, of the teachers interviewed (Georgia), admitted to being either environmental or environmentally aware, at varying levels, prior to involvement with the programme. However, the benefit of the RGSP is that teachers were able to give expression to their environmental awareness at school as well.

> I think I've always had an interest in the environment and environmental education (Arlene).

> I suppose I've been on that side of the spectrum … just someone who was interested in looking after the environment … had that certain environmental awareness and looking after the environment …(Don).

> I always have been…I think I always had in place practices that suit me, which are environmentally friendly (Anna).

> I think that previously I was as well (Nina).

This display of pre-programme environmental awareness and interest leads me to question whether the adage "preaching to the converted" is applicable here. All the teachers at Miriwinni and Hambledon schools chose to become involved in the

programme, while at Alexandra Bay the programme was already in place when the teachers became staff members.

This suggests teachers getting involved with sustainability education are the ones with a pre-existing environmental background or interest, which corresponds with similar findings from Tilbury, Coleman and Garlick (2005), Cutter (2002) and Robottom, Malone and Walker (2000) who found that "EE remains the domain of dedicated enthusiasts within schools" (Tilbury et al., 2005: 3), and "behind every successful environmental education programme is a committed individual" (Robottom et al., 2000: 157).

Georgia is the only teacher who declared not being environmental prior to involvement in the programme. Another analytical issue that emerged from the data was that of sense of place.

Sense of Place

Teachers from Miriwinni and Alexandra Bay, who work and live within highly ecologically natural and rich World Heritage listed areas, in their interview data, displayed a strong identification and assimilation with their surroundings, referred to in the literature as 'sense of place':

> Just living up here, I think I'm thinking about things a lot differently because it is so close to the reef that you need to think about your rubbish and waste and where it goes (Georgia).
>
> Living here, living in the area [exacerbated her interest in sustainability] (Anna).
>
> I love the area so much that we've made it our home, I'd like to preserve what I can (Don).

The teachers from Miriwinni and Alexandra Bay schools used emotive language and expression when referring to tropical rainforests and reefs which correlates with expressing a sense of place (Galliano and Loeffler, 1995; Eisenhauer, Krannich and Blahna, 2000). Teachers from Hambledon School, on the other hand, located in what is now the largest suburb on the outskirts of the rapidly growing regional city of Cairns, spoke about the environment in a curriculum and student focused manner, rarely displaying a discourse of emotion or attachment. For example, when participants were asked what drove them to continue teaching sustainability education the teachers from Miriwinni and Alexandra Bay schools spoke of their surrounding environments:

> Living here, living in the area. (Anna).

In comparison the teachers from Hambledon School reported reasons that were student and curriculum oriented:

> Students are the future and the environment is important, they need to develop knowledge and understanding of issues and taking some action…Sustainability is becoming more part of the curriculum... (Zena).

The suggestion that teachers in small rural schools may perform formal sustainability work in schools more out of a sense of place is worthy of further investigation. This is not to say that place attachment is not important in large urban schools, but the dedication of teachers and success of the RGSP in small rural schools in Queensland may additionally be propelled by attachment to place.

Sense of Responsibility

One interesting aspect of the data that Don and Georgia directly brought up is responsibility, which merits mention in light of political discussion over recent years on values education.

> I suppose my focus has been for them [students] to take a bit of responsibility for our own environment… (Don).
>
> I think it's an excellent programme…Teaches responsibility and pride in their back yard (Georgia).

These ideas of responsibility directly correlate with:

1. Literature on sustainability, which often states responsibility as being a goal of sustainability education (see Department of the Environment and Heritage, 2005; Vaske and Kobrin, 2001).
2. The Australian Government Department of Education, Science and Training's (2005) 'values framework' which includes responsibility as one of the 'Nine Values for Australian Schooling'.
3. Research by Summers, Corney and Childs' (2003) study into primary school teachers' experiences of teaching sustainability education which, among other things, found that teachers particularly emphasise responsibility.

A study carried out by Vaske and Kobrin (2001) reports emotional attachment to a place leads to environmentally responsible behaviour in everyday activities. Likewise, Don and Georgia's data suggests that over the time that they have lived in their rural areas they have developed a sense of place which appears, in turn, to have had implications for their uptake of environmentally responsible behaviour. Research in this field, however, is still very limited (Vaske and Kobrin, 2001), therefore, these connections are only speculative at this stage. The intersections of teacher learning, sense of place and sense of environmental sustainability appear to be valuable areas for future study.

5. Final Words

Examination of the interview data makes it apparent teacher learning has taken place through the RGSP. All participant teachers demonstrated that as a result of participating in the programme they are thinking and acting more coherently with regards to sustainability and the reef. Of interest is that nine of the ten teachers admitted to being either environmental or environmentally aware prior to involvement with the programme. This is not unexpected given that committed teachers do drive the implementation of the RGSP in schools. However, it raises the question that if we are to become sustainable how do we persuade the unconverted to convert?

However small a study, these research findings are significant in view of a reported lack of evaluation of sustainability education programmes (Henderson and Tilbury, 2004). Nevertheless, to advance our understanding and movement towards sustainability, more research needs to be done which can uncover the links between teaching, learning, sustainability experiences, sustainability programmes and uptake of sustainability. This small scale study has helped to open up the way.

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