

2013 Sabbatical Study Report

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A Study of Cost Effective Provisions for Environmental Science Programmes in Primary Schools.

Introduction

The Education Review Office recently announced that a little over a quarter of primary schools have effective science programmes. A report released shows that only 27 per cent of New Zealand schools have science programmes for Years 5 to 8 that are considered "effective" or "generally effective," based on 100 schools reviewed by the agency in 2011. Having been part of that review and signals given by the reviewer that the programmes run at ROPS were effective, I believed there was a strong foundation to build upon and saw the opportunity to extend provisions through a more strategic approach to environmental science.

The New Zealand Curriculum provides a context for developing teaching and learning programmes for environmental education. Schools generally have a range of policies and practices through which the aims of Environmental Education can be met. Funding programmes that are high quality and serve the needs of the school can be problematic as resources, both human and material, are not inherent in schools' operational grants. The purpose of this study was to investigate good practices that are happening within New Zealand schools and to seek information on use of staff and material resources to effectively deliver programmes.

At ROPS (decile 8 inner city contributing primary school with 640 students) we have a teacher who was employed to teach environmental science for one day per week in 2012 and increased to two days per week in 2013. This is funded by the Board of Trustees and is managed through the school's intensive fundraising programme. The teacher spreads her time across the whole school working in a variety of ways and for a variety of expected outcomes. She, with the support of some staff and parents, has developed gardens and worm farms, involved student leaders to research and lead environmental programmes such as waste recycling and rainwater collection in order to provide an environment of learning that can be used independently. She has led "Travelwise"ⁱ with her team of student leaders as they have explored the effects on the environment and personal health when fewer students are driven to school by car. She has sought grants unsuccessfully from a number of sources and has recruited experts for support from "Enviroschools"ⁱⁱ and through the Auckland City Council. Whilst we are not affiliated with "Enviroschools"ⁱⁱ at this time, this is considered an area we may consider in the near future, however at this point we are enjoying creating a programme that is tailored to our school needs and interests and is truly ROPS in flavour.

2 Programme Outline

During the sabbatical, I visited five schools to look at their programmes, talk with key staff, talk with children (where possible), photograph aspects of the programmes and gain an overview of a variety

of approaches and practices. I was fortunate to be welcomed to a large inner city high decile Auckland primary school, a smaller low decile south Auckland primary school, an inner city mid-sized Wellington primary school, a Taranaki intermediate school and a small Central Otago full primary school. Many of these schools are “Enviroschools” and all have received local acclamation for their work in environmental science. In all schools I visited, I was warmly welcomed and touched by the pride that was clearly evident in the environmental science work done so far. All considered the programme to be a work in progress and had strong vision for further developments. As we see in ROPS, there is an excitement about environmental science and it is an effective approach to authentic learning and high levels of student engagement.

3 Benefits

I. Links to issues important to the school

As this is a board funded part of my school’s programme, it has been beneficial to have a greater understanding of how other schools manage, fund and sustain their environmental science. An ERO visit in 2010, which included an investigation for national purposes of our science programmes, verbally indicated that we were heading in a very positive (albeit small) direction in our science provisions. We also have a significant number of special needs children at the school and have found the gardening aspect of the programme to be beneficial to their security and attachment. Over the two years since the review and because of community interest, additional resource has gone into extending our environmental science provisions. This study has further enriched these provisions.

II. Links to the schools strategic or annual plan

Two strategic foci for our school are:

to develop and implement special learning programmes to support both intervention and extension throughout the school; and

to maintain high expectations and levels of excellent behaviour whilst fostering spontaneity and fun within our existing climate of trust and respect

As a staff we believe that the environmental science programme is a catalyst to developing both these strategic goals and would like to see it extended in the future. We are also very fortunate that the teacher leading the programme is highly skilled and enthusiastic about science teaching and has excellent skills in linking with the community to support her teaching. The Board of Trustees is keen to continue development in this essential learning area.

III. Links to personal and professional development

I have been a principal for ten years. In the first three years I completed my Masters in Education and have undertaken personal appraisal with an external consultant who has been supportive of my professional development throughout. This study is potentially a stepping stone to further study, possibly at a post graduate level.

4 Links to current schooling sector priorities

The Principles of the New Zealand Curriculum (page 9 NZ Curriculum) comprise eight statements, of which the following are particularly catered for through our environmental science programme – Inclusion, Community Engagement and Future Focus. Future Focus, in which “*the curriculum*

encourages students to look to the future by exploring such significant future-focussed issues as sustainability, citizenship, enterprise and globalisation” is inextricably linked to our environmental science teaching and learning. As we work in-depth on a daily basis to ensure we are providing literacy and mathematics programmes to gain attainment of National Standards, it is very easy for teachers to overlook the remaining Essential Learning Areas and a programme, such as this, is a way of gaining better coverage and providing more explicitly to meet need within the school. This programme is also supporting the teaching practices that have a positive impact on student learning, thus providing “Effective Pedagogy” (page 34 – 35 NZ Curriculum).

5 Study Findings

During my visits I found three key themes which I believe were of significance to my findings; authenticity of purpose, stakeholder buy-in, and funding. I will address each of these in turn. I will also use photographs to illustrate the findings.

Authenticity of purpose

In all five schools I visited, there was a genuine eagerness by staff and students to be involved in the programmes available. Gardens were developed in suitable positions for sun and shelter and vegetables chosen for growing that would serve a purpose. The “Garden to Table”ⁱⁱⁱ programme was run in two of the schools I visited. Through this programme not only did the children grow suitable vegetables, but they also tended them (in one school with support of volunteer community members), researched nutritious and cost effective recipes, harvested the crops, read the recipes and cooked the food, designed menus and in one school even developed a functioning pizza oven. Spare classrooms were set up with cooking and preparation facilities and the student engagement and enthusiasm was clearly evident. Time was clearly spent in food preparation and presentation that was nutritious and appealing.



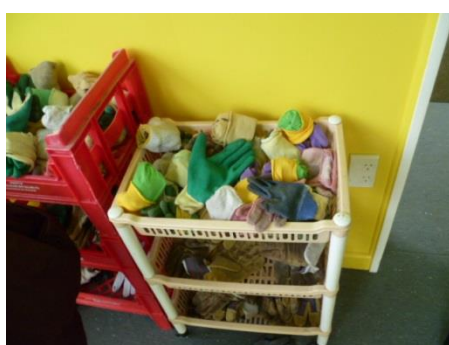
Purpose built pizza oven.



Converted classroom for food preparation.



Menu designed by students.



Gardening gear ready for use.



Carefully selected crops, some labelled in te reo.



Students actively involved in food preparation and presentation.

Other projects were developed to provide authenticity to the purpose for study. In one school, the students had communicated with a local rest home for vegetable requirements and crops were grown to be donated as they became available.

Seaweed was collected from a local beach and seaweed tea produced as a garden fertiliser. This was also used as a school fundraiser.

In two schools, local communities were approached for support for funds and goods in order to construct water tanks that collected rain water from the school roof in order to water gardens and clean dirty playground areas.

School beautification (a feature of Enviroschools) was part of school programmes and creative use of space using recycled materials and community support provided huge engagement and student involvement. As part of beautification projects, students were enabled to take leadership in design and creative, student-led decisions were made with great effect.



Water tank catching run-off from the school roof.



Creative idea regarding waste water message.



Apple tree label in te reo and Mandarin.



Scarecrow protecting native garden area.



Environmentally friendly creatures adorn an spare wall.



Student-made mosaic pathway through vege garden.



Environmental mural on old changing sheds.



Community mural – koha to the school from older siblings.



Seaweed tea brewing.



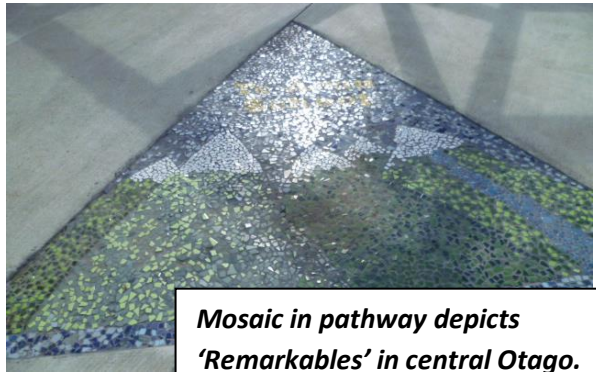
Water catchment.



Student-designed signage.



Old concrete tubs provide a planter box.



Mosaic in pathway depicts 'Remarkables' in central Otago.



Planter boxes around posts.



Covered outdoor area designed by students.



Garden development with koru shaped path.



Development of sheltered propagation area.



Providing beautification to the other side of a shelter fence.



Twisted willow hut awaiting spring growth.



Scarecrow forms part of a promotional display.

A significantly authentic project was the school I visited in central Otago. This school, along with the secondary school to which the students transitioned from primary, were involved in a project to bring the birdsong back to the Kepler track^{iv}. Research into the native birds, the reasons for the diminishing of the birdsong and the needs for it formed a major component to begin the project. Surveys were undertaken to locate the actual birdsongs and to ascertain where and what was missing. The school is now actively involved in planting native seedlings which will in time (along with the large school field claiming its fair share) be transplanted in the Kepler track. A high point, in my opinion, was the project in which the children from the adjoining Kindergarten come across to the school on their fifth birthday and plant a native seedling in a yoghurt pot to be nurtured in the propagation greenhouse. As the child turns five and becomes a student at the school, the seedling is planted out on to the main field to depict the transition from one stage of life to the next. This delightful flow-through from stage to stage (even on in to secondary education) is a truly authentic and worthwhile project within this community.

Propagation greenhouse, purpose built.



Stakeholder buy-in

To my astonishment, in two of the five schools I visited, the lead teachers commented that they felt alone and unsupported in the development of environmental science provisions within their schools. They believed they were leading the project alone and that generally teaching staff saw it as an addition to their already over-full timetables. Although there were a variety of excellent practices happening within the two schools and the lead teachers themselves were passionate about the

programmes, the workload for the lead teachers was, at times, unmanageable. In one school the lead teacher was a Deputy Principal who was released from classroom teaching. For that lead teacher, a day a week was set aside as time allowed and groups of children were withdrawn from class to work on the varying projects. This also was the way we generally worked here at ROPS



during 2012 and 2013. This pull-out type of programme, in order to be effective should integrate with regular curriculum and ensure a match between the pace of the programme and the student's rate of learning. So too, withdrawal programmes should replace or enhance the regular classroom curriculum and not be seen as "add ons" (Rogers, 2000b). The Ministry of Education (2000) recommends close and regular communication between mainstream and withdrawal programme teachers and Rogers (2002b) supports that recommendation with the suggestion that time is made available for mainstream and "specialist" teachers to work and plan together. For the other teacher, only an hour a week was provided, making the role very hard to manage and it was evident that enthusiasm for the work was certainly waning.

The lead teachers in one of the five schools, however, commented very favourably about staff buy-in and being supported and valued for the work being done. In that school the lead teacher was a part time teacher, employed for three days a week to support and develop programmes and was assisted also by a teacher aide who was employed for the "Garden to Table" programme times to oversee the cooking aspects. A huge variety of projects were able to be managed and the school certainly showed that environmental science was a very big part of its culture. Major gardening and artistically presented environmental projects were commonplace throughout the school. Much of the lead and organisation was undertaken by the lead teacher who was seen more in a specialist role.

In one other school, a sizeable team of volunteers from another part of the city gave up a day a week to work with the children and their teachers on the "Garden to Table" programme. This meant that several adults were supporting in the garden and several others in the kitchen. This was overseen by a lead teacher but generally the release aspect was done by the benevolent volunteers. This school placed its major focus on "Garden to Table" to keep it manageable although as an "Enviro School" there were other smaller projects happening. This school also had a specially designated environmental science room, purpose built from the refurbishment of an old dental clinic. Again, it appeared that there was effective staff buy-in and the work load was well managed.

In the fifth school (which was the smallest of all the schools I visited), although there was no actual lead teacher with release, environmental science was a part of the school culture and every teacher was actively involved. Discussions occurred with the whole staff during break times and at scheduled meeting times and a highly collaborative and close-knit staff relationship was apparent. In this school, one teacher, as he met his new class at the end of each year, took the children out to dig the

patch and plant potatoes. After the summer break and an extended period of time, the crop of potatoes was dug up and a percentage allocated to the local rest home to help feed the residents and the remainder used for a judged cook up event. This type of project was very much a part of this fifth school.

Funding

All schools I visited shared a common concern – lack of available funding. Where budgets were strategically developed to include part time teacher components and/or teacher aide provisions the manageability of programmes was realised. This was, however, often at a cost to other curriculum learning areas. Where funding was less and teacher release was unavailable, it was less likely that programmes could be sustained effectively. There was evidence of a correlation between funding and teacher release and programme effectiveness. To truly do an environmental science programme effectively schools need to seriously consider and plan for appropriate funding. A part time, science-minded enthusiast for even one day a week (even at teacher aide rates) will significantly support the provision of a manageable programme. Given the high levels of student engagement and spin-off authentic learning when a programme is successfully implemented, it is money well spent. However, costs are not for staffing alone. Additional budget is required for the materials and resources that are required to have the programme operate eg: other ingredients for cooking, cooking utensils, kitchen set up, gardening equipment, plants and fertiliser, garden storage. There are a number of grants available which are well worth applying for and occasionally local businesses may support the programme. There is also access to voluntary community support if good relationships are developed and expectations shared. There is also, at times, financial support through the provision of cheaper or no cost materials, again with relationships formed with local businesses. All these avenues are well worth trying but the time to do so is huge and adequate release or support is required.

6 Conclusion

Upon my return to ROPS the impact of the sabbatical study has been significant. The .4 part time component continues and this year and every class is expected to undertake its own environmental project and the evidence of this practice development has been set as an appraisal goal. In term 1, as a build up to the school Carnival and to start a more school-wide approach to environmental science, every class researched the best way to construct a scarecrow. At the end of term, the local intermediate and secondary school principals came to ROPS and judged the best scarecrow. The winner stands at the front gate in pride position (that is until it gets too wet and turns to pulp)!

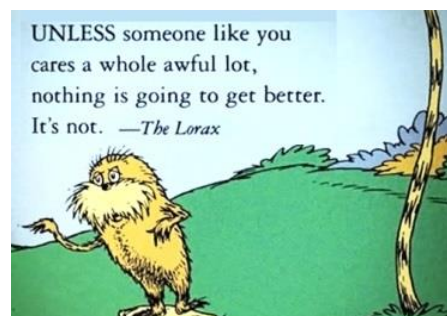


The remaining scarecrows were sold at the Carnival and were certainly created great interest. This was a great introduction and now we move into a more class-by-class approach. A list of projects

has been collated in negotiation with the class teachers and the lead teacher and circulated as follows:

Environmental Projects 2014

- Rm 29 Year 5/6: *Energy Saving in the school*
- Rm 28 Year 5/6: *Wormy Worxs/expanding worm farms*
- Rm 27 Year 5/6: *Vertical gardens/Vege garden*
- Rm 26 Year 5/6: *Sensory garden*
- Rm 24 Year 5/6: *Bokashi Bins/Telephone recycling*
- Rm 23 Year 4/5: *Water to the drain/Water conservation*
- Rm 22 Year 4/5: *Bug Busting*
- Rm 21 Year 4: *Bird feeders*
- Rm 20 Year 4: *Chickens at school*
- Rm 19 ESOL: *Vegetable gardening/Seed germinating*
- Rms 17/16 Year 3: *Bug hotels*
- Rm 15 Year 4: *Water Conservation/Adopt a Stream*
- Rm 14 Year 3: *Butterflies and Bees/Pollination*
- Rm 13 Year 3: *Weather and the environment*
- Rm 12 Year 2/3: *Courtyard Development*
- Rm 11 Year 2: *RTL B Fernery*
- Rm 10 Year 2 & Eco warriors: *Play Area Development at bottom of field*
- Rm 9 Year 2: *Herb/Vege Gardening*
- Rm 8 Year 2: *RTL B Fernery*
- Rms 6/7 Year 0/1: *Planter Boxes*
- Rms 5A/5B Year 1: *Tyre Gardening in Crown Street Car Park*
- Rms 3/4 Year 1: *Pizza garden development opposite end of RTL B Building.*



I received the following email from the lead teacher to staff during the second week of the holiday break:

“Just want you to know I am able to meet with any of you this week, any day, any time. Please email with a suggested time, if you would like to brainstorm and/or plan or maybe you just want reassurance you are on the right track, there isn't really a wrong track with this, but sometimes it's good to just have another set of eyes on your concept. You might want to just communicate via email, ask a few questions etc, feel free to do this too. I will check my email regularly this week. My phone number is xxx.

During the term I can work alongside you in your class or outside, take specific sessions you would like done (I will research and organise these with your specific needs in mind). Another option is to have me take other curriculum areas for you while you take groups to do the project work. You can book me in for any of this. It can be a flexible booking as sometimes you may not get to a certain point in time or a definite slot. Remember, I work Tuesdays and Wednesdays for environmental science.”

I am very aware that we are extremely fortunate to have a Board of Trustees with the vision to support this approach. This is certainly a significant cost to the school. Not only is the part time teacher Board funded, but additional funds are set aside for environmental science too. My observation during the sabbatical certainly showed that where there was time made available to support projects, more could be accomplished. It also demonstrated that where effective projects

took place, greater staff buy-in could be gained. We have a strong and capable lead teacher in this role, but by devolving some of the responsibility to each class teacher with her support, I believe we can ensure greater sustainability and succession planning for the future. As a result of this study, we have now provided a designated space as an environmental science room in which “eco warriors” can meet, resources can be housed, purpose-made displays can be presented as well as a location for the lead teacher to call her own. I aim to have environmental science as a natural and expected aspect in our school culture now and into the future – a point of difference at ROPS. I am confident we are well on the way to having highly successful, student-led and authentic learning in our school and young citizens who are concerned for and taking an active role in the protection of their planet.

ⁱ *The Travelwise programme is a schools-based programme that aims to improve road safety and achieve a reduction in the number of vehicles driving to and from school at peak times. It does this through encouraging and increasing alternative modes of travel, and providing safer facilities for all road users. Any primary, intermediate or secondary school in Auckland can sign up to become part of the Travelwise programme. Numerous schools have already signed up and have a safe school travel plan in place. Since its inception in 2005, Travelwise has achieved the following results:*

- 70 percent of all Auckland schools are Travelwise schools.
- Safe School Travel Plans are associated with a 6.05% decrease in car use and an increase in active modes (walk, walking school bus, scooter).
- 12, 736 fewer vehicles on the road in the morning peak.
- In 2013, 9348 students in 93 schools received cycle training through Auckland Transport's BikeSafe programme.
- 1594 children using 359 walking school bus routes.

ⁱⁱ *The Enviroschools Programme is a unique sustainability journey that over 860 early childhood education centres and schools in New Zealand are on. Through exploration and discovery, students develop learning and language, care and creativity, relationships and responsibilities suited to their developmental stage. What emerges is a connection with nature and a sense of belonging to the environment and community. Through these connections with the environment students can consider the world they are part of, and look to how they make decisions to improve the physical and social environment of their places, their community and their world. Students in early childhood centres and schools that are working towards sustainability play a significant role in creating sustainable communities by:*

- being role models of sustainable practices
- enabling students to be teachers amongst their families and peers
- creating future leaders who understand how to make informed decisions and take action.

ⁱⁱⁱ *Garden to Table aims to change the way children approach and think about food. The programme allows children across the country to enthusiastically get their hands dirty and learn how to **grow, harvest, prepare** and **share** fresh, seasonal food. The fundamental philosophy that underpins the programme, is that by setting good examples and engaging children's curiosity, as well as their energy and their taste buds, positive and memorable food experiences are provided that will form the basis of positive lifelong eating habits. The New Zealand Garden to Table Programme began in 2008 when New Zealand food writer and cook Catherine Bell gathered a group of like-minded people together. Three pilot schools joined in 2009 and the number is increasing. Garden to Table schools commit to a dynamic and innovative model that sees kitchen and garden classes run weekly, enabling skills-based learning that extends across the entire school curriculum. As participants in the Garden to Table Programme, seven to ten year-old children spend time in a productive veggie garden and home-style kitchen each week. There they learn skills that will last them a lifetime, and discover just how much fun it is to grow and cook their own seasonal vegetables and fruits. Garden to Table schools are located across New Zealand, across all decile levels and as funding permits.*

^{iv} *The Kepler Track combines all the famous Fiordland features such as moss-draped beech forest, rich bird life, alpine tussock, mountain ranges, gushing waterfalls, U-shaped valleys, river flats and limestone formations. Starting and ending near Te Anau, the track carves a loop on to Mt Luxmore and the Kepler range, down to the Iris Burn and through hanging valleys to Lake Manapouri.*

References:

Ministry of Education. (2000). *Initiatives in Gifted and Talented Education*. Wellington: Learning Media.
Rogers, K.B. (2002b). *Re-forming Gifted Education*. Scottsdale, AZ: Great Potential Press.