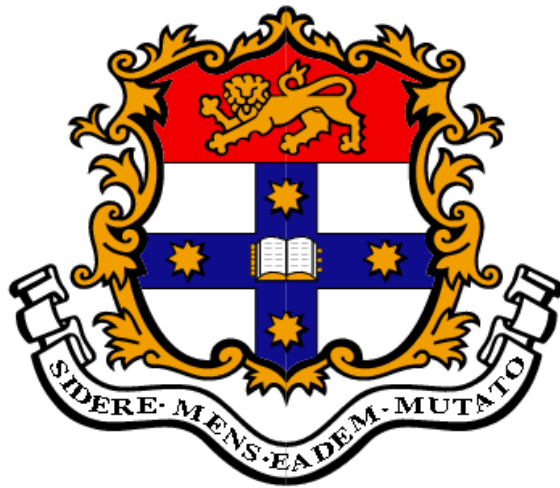


# Exploring School Kitchen Gardens as a Potential Agent for Social Change

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A handwritten signature in black ink, appearing to read 'D. Brooks', written over a horizontal line.

**Date: 2<sup>nd</sup> November 2009**

## **ABSTRACT**

### **Exploring School Kitchen Gardens as a Potential Agent for Social Change**

Interest in the use of School Kitchen Gardens as a potential agent for social change came from readings of Professor John Dewey's works. Dewey advocated a hands-on practical approach to education to teach some of the life skills he felt were being lost due to the industrial revolution. One element of this approach was the use of gardens to teach children the skills needed to grow their own food.

One hundred years on and a program in Australia, run by the Stephanie Alexander Kitchen Garden Foundation, is using school kitchen gardens to educate children about how to grow organic fruit and vegetables, harvest the produce they have grown, prepare it to eat in a kitchen and then share the food around a table.

Developing healthy food choices and learning life long healthy eating habits is seen as the cornerstone for the program, although children are also learning some of the same life skills as Dewey's students 100 years ago.

As well as the potential to inspire healthy eating habits, an interest developed around the use of school kitchen gardens to help teach students environmentalism. The similarities between the skills being learnt by students taking part in the Stephanie Alexander Kitchen Garden Program and the skills that some environmental groups are heralding as essential for society to learn to live with the potential impacts of climate change. Hence, an interest in the possibility of school kitchen gardens being able to be act as an agent for social change.

A qualitative approach has been taken to explore this question with content analysis of secondary sources including Dewey's works and the Stephanie Alexander Kitchen Garden Foundation. Personal communication with Stephanie Alexander and Derrick Ashby, the NSW Kitchen Garden Program Coordinator, has also provided valuable primary material. An Arts Based Educational Research methodology has been used to present the data, analysis and conclusion chapters are in the form of an interview transcript. It is hoped that this approach will make the thesis more accessible to people outside the traditional academy setting (Barone & Eisner, 2006, p.97).

The conclusion has been reached that School Kitchen Gardens can be used not only for environmental education and to encourage healthy eating choices but also as possible agents for broader social change in the face of challenges being created by climate change. It is also suggested that the Stephanie Alexander Kitchen Garden Program aligns well with the New South Wales model of quality pedagogy, lending itself to some of the current thinking around best practice of successful pedagogical approaches.

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## CHAPTER 1: Introduction

This thesis explores the use of School Kitchen Gardens as a potential agent for social change. The focus is primarily on the works of John Dewey which provide a historical lens and the Stephanie Alexander Kitchen Garden Foundation program which provides a contemporary example of the potential for school kitchen gardens to serve as a vehicle for societal change.

At the turn of the Century, Dewey was concerned about the loss of practical life skills amongst the population of America, which he felt was due to the industrial revolution. These skills included farming, cooking, carpentry and weaving etc. As a part of his 'new education' Dewey used practical 'hands-on' classes and lessons to not only teach the life skills he felt were being lost but also to teach literacy, mathematics and other subjects (Dewey, 1915/1990, p.9).

The Stephanie Alexander Kitchen Garden Program was established in 2004 and following early success of a trial in Victoria involving 40 schools, the program is now being rolled out in up to 190 primary schools across Australia (Stephanie Alexander Kitchen Garden Foundation, 2008). The program is specifically aimed at students in grades three to six, and is designed to teach children how to care for the environment, in a fun and friendly way, by growing their own fruits, herbs and vegetables, while also incorporating literacy, numeracy and creativity into practical and easy to handle tasks. The aim of the Kitchen Garden Program is pleasurable food education for young children. The underlying belief is that by introducing a holistic approach there is a chance to positively influence children's food choices in ways that have not been tried before (Alexander, 2006, p12).

Before starting the Master of Teaching course at the University of Sydney I had spent a lot of time studying environmental sustainability and exploring what it may mean, look or feel like to be 'sustainable'. My undergraduate degree was in Environmental Policy and I have lived on an organic farm where I studied for a Diploma in Accredited Permaculture Training.

Whilst studying for my teaching qualification I found myself becoming more and more interested in the philosophies of John Dewey and the pedagogical methods he advocated. I also found the reasons why Dewey advocated the need for a 'new education' in the first place fascinating. Notably, the changes that Dewey saw in society brought about by the onset of the industrial revolution and the loss of traditional farming and practical life skills. Having grown up learning a lot of practical skills due to my father being an engineer, I have an appreciation for how important this skill set has been for me throughout my life, providing a very solid foundation to build other skills upon.

I noticed that some of the methods and similarities between Dewey's philosophies and those advocated by the Stephanie Alexander Kitchen Garden Foundation 100 years on were striking. I wanted to explore the similarities between Dewey and the Stephanie Alexander Kitchen Garden Foundation and their underlying potential for social change, not only in the arena of healthy food choices and tackling the obesity epidemic but also as a tool in the transition towards a more sustainable, green and environmentally healthy future.

When referring to 'social change' I am making reference to the potential changes to the way society lives that may be brought about by climate change. When speaking of schools

as agents for social change I am referring to the potential ability for schools to aid in the process of society adapting to these changes. I have developed a specific focus on the potential impact on food security that climate change may bring. This is a potentially huge area of cultural significance and learning the skills of organic gardening at a young age may help improve food security.

With relation to environmental education, there have been persistent and critical commentaries about the effectiveness of environmental education programmes and little evidence that these programs have a sustained effect on students beyond schools, and on the ways that people act in their adult lives (Oulton & Scott, 2000, p.492) it may, therefore, be time for a different approach.

There has also been a focus on schools as agents of social change in some of the historical lessons learned by Dewey and the Progressivism movement. Dewey felt that schools could become the vehicle for producing a more harmonious society. This vision was often met with resentment however, especially by those who did not feel that schools should change society and also by those who did not feel society needed changing (Zilversmit, 1993, p.6).

This research question necessitated a qualitative approach with content analysis of secondary sources including Dewey's works and the Stephanie Alexander Kitchen Garden Foundation as the two the main sources of data. Personal communication with Stephanie Alexander and Derrick Ashby, the NSW Kitchen Garden Program coordinator, has also provided primary material. An Arts Based Educational Research methodology has been used to present the data, analysis and conclusion chapters in the form of an interview transcript. The imaginary interview is between John Dewey, Stephanie Alexander and me as interviewer. This hopefully allows my own voice to come through in the thesis. The interview is imaginary in that it could never have taken place due to John Dewey having passed away. All material used to construct the conversation is from references and therefore, hopefully, a reasonable reflection of how a conversation may have unfolded between the three parties. It is hoped that producing a transcript in this way the thesis and the ideas within it will be more accessible to people outside of the academy (Barone & Eisner, 2006, p.97).

I feel that there are grounds to suggest that the Stephanie Alexander Kitchen Garden Foundation may well have the potential to teach environmental education and to encourage healthy eating choices but also as a possible agent for broader social change in the face of challenges being created by climate change. Ironically, this may well be due to the fact that it is not openly pushing for social change. By teaching healthy eating choices and tackling the obesity epidemic, it seems that the Foundation may inadvertently be teaching the skills and techniques necessary to move towards a more carbon neutral society whilst increasing the possibility of local food security. Another major advantage of the program in terms of it being accepted may be that it would appear to align very well with the NSW Department of Education and Training 'Quality Teaching in NSW Public Schools' model of pedagogy. Pedagogically, it is on a very sound footing and lends itself to some of the current thinking around best practice of successful pedagogical approaches.

This exploration of the quality teaching model has had direct professional significance due to the opportunity to develop a deeper understanding of the model and exploring what that

pedagogy may look like in practice. The following chapter explores the literature around some of the areas of study mentioned in more detail and depth.



## CHAPTER 2: Literature Review

This chapter builds on the introduction provided in chapter 1 by exploring in more depth the literature around the areas of current environmental concerns, environmental education, school kitchen gardens and environmental education, the effects of climate change on food security, environmental education and social change and schools as agents for social change.

The modern environmental movement is often credited as starting with the release of a book in 1962 by a little known biologist and writer, Rachel Carson. (Lakewood Public Library, 2005). *Silent Spring* (1962) was a powerful warning of the growing danger of the unrestricted use of chemical pesticides and herbicides such as DDT and the threat they posed to natural ecosystems of which humans are a part. The use of these chemicals in agricultural practice had greatly reduced the number of bird species on farms and their resultant noisy 'songs' hence the title *silent spring*.

Fifty years on, the use of chemical pesticides is still a major environmental issue. There are also many other pressing environmental concerns facing both the planet and society. When making reference to the use of 'School Kitchen Gardens as a potential agent for social change', I am referring directly to the types of changes that society may need to make in order to adapt to climate change.

### Current Environmental Concerns

#### *Climate change*

The Intergovernmental Panel on Climate Change's Fourth Assessment Report, published in 2007, states that it has 'very high confidence' (defined as being at least a nine out of ten chance of being correct) that 'the global net effect of human activities since 1750 has been one of warming' (IPCC Summary for policy makers, p.3).

Sea levels are rising, and the rate of that rise is accelerating; the years 1993 – 2006 saw average rises of 3.3 millimeters per year, far greater than the Intergovernmental Panel on Climate Change's prediction in 2001 of rises of 2 millimeters per year (Brahic, 2007). A recent report prepared by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology for the Australian Government's National Review of Drought Policy entitled '*An assessment of the impact of climate change on the nature and frequency of exceptional climatic events*' notes that the area affected, the extent and frequency of exceptionally hot years have been increasing rapidly over recent decades and that the trend is expected to continue (Hennessy, Fawcett, Kirono, Mpelasoka, Jones, Bathols, Whetton, Stafford Smith, Howden, Mitchell, & Plummer, 2008, p.1). The report goes on to suggest that most of the global and Australian warming since the mid-20th century is very likely due to increases in greenhouse gases and that about 50 per cent of the rainfall decrease in southwestern Australia since the late 1960s is also likely to be due to increases in greenhouse gases (Hennessy et al., 2008, p.3).

The idea of becoming 'carbon neutral' and reducing your carbon footprint are now becoming more common, as are public awareness campaigns about the need to reduce emissions of green house gasses from the use of non-renewable fossil fuels. One recent

example saw people from 181 countries came together for a day of environmental action on the 24<sup>th</sup> October 2009. At over 5200 events around the world, people gathered to call for strong action and bold leadership on the climate crisis (350, 2009).



Fig 1 '350 - International Day of Climate Action 24<sup>th</sup> October 2009' Sydney Opera House, Australia ([www.350.org](http://www.350.org))

The idea behind '350' is the possibility that 350ppm of CO<sub>2</sub> in the atmosphere is a safe level and that current levels are dangerously high. A report from 2008 suggests the following:

*If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth has adapted, paleoclimate evidence and ongoing climate change suggest that CO<sub>2</sub> will need to reduce from its current 385 ppm to at most 350 ppm but likely less than that*

(Hansen, Sato, Kharecha, Beerling, Berner, Masson-Delmotte, Pagani, Raymo, Royer & Zachos, 2008, p217)

An obvious way of helping to reduce the amount of carbon dioxide in the atmosphere is to reduce the use of fossil fuels and to provide people with the knowledge about how to do this.

### Environmental Education

Environmental education is a relatively young field that can trace its foundations back to the beginning of the environmental crisis of the late 1960s and 1970s.

The field of environmental education was created as a solution to the problems identified by environmental scientists such as climate change (Van Weelie & Wals, 2003). Within this, the task of defining the parameters of the discipline has been taken up by global

organisations such as UNESCO and the debate on the appropriate pedagogical models for environmental education has been engaged by academics working in the at universities (Loughland, 2006, p.27).

The Tbilisi declaration refined the Belgrade Charter (UNESCO, 1975) to produce a broad description of the parameters of environmental education:

*Environmental education, properly understood, should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world. It should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values.* (UNESCO, 1977, p.24)

A recommendation contained within chapter 36 of Agenda 21, a charter developed at the Earth Summit in Rio in 1992 to promote sustainability around the globe (United Nations Sustainable Development, 1992) recommended multi-disciplinary responses to issues of environmental sustainability and called for a reorientation of education towards sustainable development. (United Nations Sustainable Development, 1992). This was a significant development for the young field of environmental education.

The Thessaloniki declaration of 1997 reaffirmed UNESCO's commitment to education for sustainable development (UNESCO 1997). Education for sustainable development remains a key priority for UNESCO, with the years 2005 – 2014 declared the decade of education for sustainable development (UNESCO, 2005).

### School Kitchen Gardens and Environmental Education

There are often said to be three different kinds of environmental education. These are education *about*, *in* and *for* the environment (Lucas, 1979). Within this framework, education *about* the environment is associated with developing scientific knowledge about the environment, education *in* the environment involves students spending time in the natural environment whilst education *for* the environment aims to promote pro-environment views in students (Davis, 2003).

It is suggested in the literature that Learning *about* environmental problems is not sufficient to instil a deep sense of environmental stewardship in students. (Hart & Nolan, 1999; Rickinson, 2001; Kollmus & Agyeman, 2002). As Russell and Hodson (2002, p. 489) claim, 'it is not enough for students to be armchair critics'; they need to get their hands dirty and learn how to take action'. It is this action-orientation that characterises 'education *for* the environment' (Barrett, 2006).

One action-oriented method of environmental education where students are 'getting their hands dirty' is through the use of organic vegetable gardens in schools to grow and produce vegetables.

Although this method is not new, it is discovering resurgence. In earlier eras, Rousseau, Gandhi, Montessori, and most notably, Dewey promoted the use of school gardens (Subramaniam, 2002). Dewey often mentions gardening and cooking in his works:

*When a group of children are actively engaged in the preparation of food, the psychological difference, the change from more or less passive and inert recipiency and restraint to one of buoyant outgoing energy, is so obvious as fairly to strike one in the face*  
(Dewey, 1915/ 1990, p.15)

Dewey also talked of the benefits of engaging directly with gardening in a hands-on way:

*No number of object-lessons, got up as object-lessons for the sake of giving information, can afford even the shadow of a substitute for acquaintance with the plants and animals of the farm and garden acquired through actual living among them and caring for them.*  
(Dewey, 1915/ 1990, p.8)

Piaget in his work talks of the importance of pupils' active participation. He felt that 'A truth learnt is only a half-truth 'the whole truth is reconquered, reconstructed and rediscovered by the pupil himself/herself' (Munari, 1994, p.4). He felt pupils should actively experiment with a view to reconstructing for themselves what is to be learnt. 'Children do not learn to experiment simply by watching the teacher performing experiments', he warns 'or by doing exercises organised in advance; they learn by a process of trial and error, working actively and independently, that is, without restriction and with ample time at their disposal' (Munari, 1994, p.4).

In Australia, the school garden movement was strongly influenced by the annual School Garden Conference in 1903, sponsored by the Australian Natives Association. This led to the propagation of school gardens in the early decades of the twentieth century that were viewed as ideal for integration with the educational curriculum and for incorporating the standards of "progressive conservation" with its concerns for the responsible stewardship of nature as well as the ideas about connections between nature, hard work and moral improvement (Subramaniam, 2002, p.3).

Kitchen gardens in schools are experiencing a new lease on life in Australia through the Stephanie Alexander Kitchen Garden Foundation. The program was established in 2004 and following early success has recently been trialed within 40 schools across Victoria. The Australian Government has now committed \$12.8 million to fund infrastructure for the Stephanie Alexander Kitchen Garden National Program in up to 190 primary schools across Australia. Infrastructure grants of up to \$60,000 per school will be available over a four year period from 2008 to 2012 (Stephanie Alexander Kitchen Garden Foundation, 2008).

The program is specifically aimed at students in grades three to six and is designed to teach children how to care for the environment, in a fun and friendly way, by growing their own fruits, herbs and vegetables, while also incorporating literacy, numeracy and creativity into practical and easy to handle tasks. The aim of the Kitchen Garden Program is pleasurable

food education for young children. The underlying belief is that by introducing a holistic approach there is a chance to positively influence children's food choices in ways that have not been tried before (Alexander, 2006, p12).

One question to ask about School Kitchen Gardens is if they provide sufficient experiential education to cause measurable and observable changes in student achievement and behavior?. Blair (2009) critically examines the evaluative research on school-gardening outcomes. He concludes that although educators widely use school gardens for experiential education, researchers have not systematically examined the evaluative literature on school-gardening outcomes. Blair reviewed the U.S. literature on children's gardening, taking into account potential effects, school gardening, outcomes, teacher evaluations of gardens as learning tools and methodological issues. Quantitative studies showed positive outcomes of school-gardening initiatives in the areas of science achievement and food behavior, but they did not demonstrate that children's environmental attitude or social behavior consistently improve with gardening. It is noted in the journal article that validity and reliability issues reduced general confidence in these results. Qualitative studies documented a wider scope of desirable outcomes, including an array of positive social and environmental behaviors.

### The Effects of Climate Change on Food Security

One area of concern linked to climate change is that of food security.

The Food and Agriculture Organization (FAO) defines food security as:

*a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life*  
(World Food Summit, 1996).

The Intergovernmental Panel on Climate Change have predicted major changes in impacts of climate change on crop and livestock yields and forestry production by 2050. Working Group II of the IPCC, talking about the issue of climate change and food security noted that all four dimensions of food security, namely food availability (i.e., production and trade), stability of food supplies, access to food, and food utilisation will likely be affected by climate change (Easterling, Aggarwal, Batima, Brander, Erda, Howden, Kirilenko, Morton, Soussana, Schmidhuber & Tubiello, 2007, p.297).

During the past century world annual agricultural production has more than tripled. This has largely been made possible by the development of chemical fertilizers, pesticides, and herbicides; new hybrid crop varieties; the application of irrigation in arid regions; and the introduction of powered farm machinery. Central to most of these strategies for intensifying farm productivity were fossil fuels, especially oil and natural gas which produce most nitrogen fertilizers, pesticides and herbicides (Heinberg & Bomford, 2009, p.2).

Fertilizer run-off has led to oceanic dead zones at the mouths of rivers; the search for more arable land has driven widespread deforestation; irrigation has caused the salinisation of soils, pesticide and herbicide pollution of air and water has adversely affected the health of humans as well as thousands of plant and animal species (Heinberg & Bomford, 2009,

p.2). The simplification of ecosystems for the production of monocrops has exacerbated the ongoing loss of habitat for birds, amphibians, mammals, and beneficial insects (Green, Cornell, Scharlemann, Balmford, 2005).

Ironically, the industrialization of the food system has also lowered food quality. Hundreds of millions of poor, middle-class, and even wealthy individuals in industrialized nations suffer from malnutrition, often hidden and sometimes, paradoxically, accompanied by obesity resulting from the consumption of highly processed foods low in essential nutrients. Four of the leading causes of death in these nations—heart disease, stroke, Type 2 diabetes, and cancer—are chronic diseases linked to diet. (Heinberg & Bomford, 2009, p.5)

A paper in the *International Journal of Pediatric Obesity* by Wang & Lobstein summarised the available information on recent trends in child overweight and obesity prevalence in papers published between January 1980 and October 2005. Data for trends over time were found for school-age populations in 25 countries and for pre-school populations in 42 countries. Obesity and being overweight was found to have increased more dramatically in economically developed countries and in urbanized populations with the authors concluding that there is a growing global childhood obesity epidemic (Youfa and Lobstein, 2006, p.11).

One alternative to farming methods that are heavily reliant upon fossil fuel, chemical and pesticide inputs is organic agriculture. Organic agriculture is as a holistic production management system that avoids use of synthetic fertilizers, pesticides and genetically modified organisms, minimizes pollution of air, soil and water, and optimizes the health and productivity of interdependent communities of plants, animals and people (Scialabba, 2007, p.2).

Organic school and home gardens that cultivate traditional plants and animal breeds offer a promising option for improving the nutritional status of poor people both in rural and urban areas. Such systems greatly contribute to food availability, safety of children and nutritional status of families (Scialabba, 2007, p.11).

As an alternative model for sustainable development organic agriculture is not a panacea and has its own limitations. Its external environmental costs are much lower than those of conventional agriculture however and, in some areas, can reverse problems of natural degradation (Scialabba, 2007, p.16).

One initiative that is attempting to help communities find pathways towards a more sustainable future is the 'Transition Initiative'. The first Transition Initiative or Transition Town was in Ireland and has since spread around the globe (Hopkins, 2009, p.224).

There are 'formal' initiatives in Australia which include:

- Sunshine Coast, Queensland
- Armidale, New South Wales
- Bell, Victoria
- Bellingen, New South Wales
- Newcastle, New South Wales
- Hervey Bay Queensland
- Katoomba, New South Wales

The philosophical underpinnings of the Transition concept come from permaculture, which in essence is a design system for the creation of sustainable human settlements (Hopkins, 2009, p.139). (for more information on permaculture, see Appendix A - Permaculture Principles).

The transition movement calls for re-building community resilience in the face of possible changes that may affect society with the coming of not only climate change but also peak oil (Hopkins, 2009, p135). (any strategies that are developed to tackle climate change should also consider the possible implications of peak oil. Due to space constraints, peak oil has not been heavily focused upon throughout this thesis. For more some more general background information however, see Appendix B). A key factor of the transition initiative is the re-localisation of food production thus helping communities to become more self-reliant and generating less carbon emissions (Hopkins, 2009.p63). The practical 're-skilling' of communities to help make this transition possible is also a key element (Hopkins, 2009, 171).

The Honourable Andrew McNamara, Queensland Minister for Sustainability, Climate Change and Innovation from 2007 – 2009 spoke about some of the potential societal issues that may arise from climate change and peak oil in 2007:

*"There's no question whatsoever that community driven local solutions will be essential. That's where government will certainly have a role to play in assisting and encouraging local networks, who can assist with local supplies of food and fuel and water and jobs and the things we need from shops. It was one of my contentions in the first speech I made on this issue in February of 2005... that we will see a relocalisation of the way in which we live that will remind us of not last century, but the one before that. And that's not a bad thing. Undoubtedly one of the cheaper responses that will be very effective is promoting local consumption, local production, local distribution. And there are positive spinoffs to that in terms of getting to know our communities better. There are human and community benefits from local networks that I look forward to seeing grow."*

(McNamara, 2007)

Re-skilling local communities in the production of organic food may be one local solution to help reduce carbon pollution. Can School Kitchen Gardens and Environmental Education also help society make these changes?

It would seem that the Tbilisi declaration description of the parameters of environmental education previously mentioned would allow for this;

*Environmental education.... should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of **skills** and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values* (UNESCO, 1977, p.24) [Author emphasis]

## Environmental Education and Social Change

For three decades there has been intense activity in environmental education stimulated by international bodies, facilitated by NGOs and mediated through national and regional activities, governments, national associations, regional forums and local groups. It is however unclear what has been achieved and how far a move towards a more environmentally educated, concerned and responsible citizenry has been made (Oulton & Scott, 2000, p.489).

The publication of *Education for Sustainability* (Huckle and Sterling, 1996) highlighted that many issues remain unresolved and demonstrates some seemingly unbridgeable divisions in the worldviews of the theorists of environmental education, in their ideas for the future, and in their notions of strategies to achieve them. In the mean time, schools and teachers struggle to find their own path through a bewildering mixture of often contradictory advice and guidance, and amid doubts about their effectiveness and progress (Oulton & Scott, 2000, p.489).

There have been persistent and critical commentaries about the effectiveness of environmental education programmes and there is little evidence that these programs lead to a sustained effect, beyond schools, on the ways that people act in their adult lives (Oulton & Scott, 2000, p.492).

On top of this, recent international meetings have also asserted a strong social change agenda for environmental education that challenges the adequacy of the field's historical disciplinary relationships (Robottom, 2000, p.502).

Parts of the United Nations Conference on Environment and Development (UNCED) Agenda 21 provide a foundation for policy formulation within the field of environmental education:

*Both formal and non-formal education are indispensable to changing peoples attitudes so that they have the capacity to assess and address their sustainable development concerns.... To be effective, environment and development education should deal with the dynamics of both the physical/ biological and socio-economic environment and human (which may include spiritual) development should be integrated in all disciplines.....*

(UNCED Plenary 1992, section iv)

Further recommendations about environmental education were tabled at the International Forum of Non Government Organisations (NGO) held in parallel with UNCED. These recommendations form part of the Treaty on Environmental Education for Sustainable Societies and Global Responsibility. (NGOs International Forum, 1992, p.4). The treaty recommends that:

*Environmental education.....should be grounded in critical and innovative thinking in any place or time, promoting the transformation and reconstruction of society....*



*Environmental education is not neutral but is values based. It is an act for social transformation....*

*Environmental education should empower all peoples and promote opportunities for grassroots democratic change and participation. This means that communities must regain control of their own destiny.*

(NGOs International Forum, 1992, pp 1-2)

While there is growing recognition of the responsibility for environmental education to be an agent in social transformation, political interests within educational systems may actually frustrate the achievement of this aim. The tension between ‘central’ and ‘community interests’ in environmental education is an issue that is currently being worked through in several countries and poses another major challenge for the field (Robottom, 2000, p.511).

### Schools as Agents of Social Change

The call for schools to be agents for social change is not a new concept. Dewey held that “the only fundamental agency for good is the public school system”. (Dewey & Dewey, 1915/1962, p.xxv).

Writing in 1932, George Counts wanted educators to "engage in the positive task of creating a new tradition in American life" (Counts, 1932/1978, p.262). He wanted teachers and students to count among their primary goals the building of a better social order, not through particular reforms within the education system but by giving ‘a vision of the possibilities which lie ahead and endeavour to enlist their loyalties and enthusiasms in the realization of that vision’ (Counts, 1932/ 1978, p.34).

For several decades, conservative forces in developed nations have been reshaping social institutions and practices around economic, rather than social democratic, imperatives however (McGreggor, 2009, p.346). Global capitalism has placed education at the forefront of national competitiveness and governments have responded with education policies primarily designed to serve the needs of the market (McGreggor, 2009, p345). It is also said that there is an assumption in the field of education that schools are inherently conservative institutions that, seemingly inevitably, reinforce the dominant structures of a given social order (Ewing, 2005, p.4).

Writing in the *Journal of Educational Administration* in 2006, Lugg and Soho conclude that there are similarities between the present-day call for social justice and the earlier calls like Counts’. They also note that in practical terms however, contemporary educational leaders may be working in far less hospitable settings than their twentieth-century predecessors. Noting that administrators are under fierce accountability and financial pressures, while coping with a larger political environment that is polarized and fearful whilst the internal environment of school administration favors a “managerial” approach. Consequently, they note that embracing a social justice ethic, invites a degree of risk-taking (p.196).

The following chapter explores the methodology of Arts Based Educational Research which has been used to present the findings of this thesis.

## CHAPTER 3: Methodology

The previous chapter explored the literature around School Kitchen Gardens and social change. This chapter discusses the methodology of arts-based educational research, why it was chosen for this thesis and how it has been used to present the findings for the research question.

### Arts Based Educational Research as a Methodology

Arts-based educational research has been used over the last couple of decades by researchers and scholars as a method of inquiry that to varying degrees is both artistic and educational in character whilst striving to enhance perspectives relating to certain human activities (Barone & Eisner 1997, p.73; 2006, p.95 ).

Undertaking educational research has traditionally meant doing social science with a research purpose of certainty enhancement, underpinned by a foundationalist epistemology and the use of science-based research methods. However, arts-based researchers may pursue a different aim, one supported by an alternative epistemology ( Barone, 2003, p.209).

The purpose of arts based educational research may be described as the *enhancement of perspectives*. If traditionalists generally seek to secure solid explanations and confident predictions, arts based research aims to suggest new ways of viewing educational phenomena. Arts based educational research does not offer arguments about how to proceed within the confines of an educational encounter or policy making episode. Rather than closing off discussion about the presuppositions embodied within a research project, it moves to broaden and deepen ongoing conversation about educational policy and practice by calling attention to seemingly common-sensical, taken for granted notions (Barone & Eisner, 2006, p.96). The very nature of this non-specificity of arts based research, may of course by some, be seen as a weakness.

Arts-based educational research allows three major discourse traditions - art, education, and research - to intersect in new ways (Piantanida, McMahon, & Garman, 2003, p.185). Its usefulness depends entirely on the potential of the text itself for prompting reflection in readers and viewers about alternative interpretations of educational phenomena (Barone, 2003, p.210).

Arts-based research is defined by the presence of certain aesthetic qualities or *design elements* that join the inquiry process and the research text. The most exciting arts based educational research is said to have adopted art forms that are mostly of a literary nature such as short stories, educational criticism, literary essays and theatre and poetry. They often employ language that is evocative, contextual and vernacular employing rhetorical strategies and devices (Barone & Eisner 2006, p.97). As Dewey said

*The poetic as distinct from the prosaic, esthetic art as distinct from scientific, expression as distinct from statement, does something different from leading to an experience. It constitutes one.*  
(Dewey, 1934, p.84).

Susan Finley suggests that arts-based inquiry is well positioned as a methodology for radical, ethical and revolutionary research that is useful in addressing social inequalities and also notes that arts-based inquiry can be used to explore different and diverse ways of understanding and living in the world (Finley, 2008, p.71). As Einstein famously said *The significant problems we face cannot be solved by the same level of thinking that created them* (Einstein, n.d) and I believe this applies to environmental and therefore societal sustainability. It is the freedom afforded researchers using an arts-based inquiry methodology to think differently, to think outside of the box and adopt a different level of thinking to explore, that attracted me to using an arts based inquiry methodology for this thesis. It is also hoped that the way the findings have been presented, in the format of a narrative interview transcript script will open the findings of the thesis to a broader audience outside of the academy, including non-researcher educational practitioners, educational policy makers or members of the general public (Barone & Eisner, 2006, p.97).

Writing in 2003, Piantanida, McMahon, & Garman (p.184) put forward three indicators to suggest that arts based educational research is evolving from an individual interest among a handful of scholars into a distinctive inquiry tradition. Firstly, there is a growing body of literature that can be clustered under a label of arts-based educational research, secondly, the American Educational Research Association has set up a special interest group :

*The Arts Based Educational Research Special Interest Group of the American Educational Research Association (AERA) provides a community for those who view education through artistic lenses, who use a variety of arts-based methodologies, and who communicate understandings through diverse genres.*  
(AERA Arts Based Educational Research, 2008)

Third is the increasing number of forums, such as a special issue of *Qualitative Inquiry* journal ( 2003, 9(2)), devoted specifically to providing examples of arts-based studies and exploring methodological issues. It is felt that such developments challenge the notion that all educational research must conform to the norms of a “culture of science” (Piantanida, McMahon, & Garman, 2003, p.184).

Arts informed inquiry as a methodology has also been gaining popularity within the Faculty of Education & Social Work at the University of Sydney, Australia, over the last decade and has been used by a number of researchers to interpret educational experiences and improve professional practice in education (Ewing & Hughes, 2008, p.512). One example is that of a composite narrative constructed by John Hughes (2003) which explored a range of secondary student teachers’ accounts of their pre-service experiences in learning to teach poetry and drama. Hughes developed a composite narrative through the eyes of a fictitious student, Megan, and narrated her ‘story’ to both represent the group’s experiences and to embody the effectiveness of a pedagogical approach. When submitted to a refereed journal, one reviewer of the article found the narrative Hughes had created so authentic that he demanded ‘Megan’ be recognised as the co-author (Ewing & Hughes, 2008, p.p. 512 – 513).

## Arts-based Educational Research as Applies to this Thesis

The narrative interview transcript that has been developed for this thesis can be classed as a creative nonfiction piece (Barone, 2008, p.108). Creative in the sense that the interview portrayed could never take place - Professor Dewey passed away in 1952 and the Stephanie Alexander Kitchen Garden program was not launched until 2001. This is non-fiction in the sense that the route taken by the interview to reach its destination has been guided by researched and referenced material referring directly to Dewey and Alexander.

As Barone notes, arts-based inquiry projects can be research based as many of the strategies employed by arts-based researchers resemble those of social science-based qualitative researchers. These may include interviewing, observation, participant observation, document analysis and member checking (2003, p.210). Document analysis has been employed for this project. An essay plan underlies the construction of the interview transcript with a more flowing, organic building method used to construct the conversation.

Data collection and analysis has been mainly from secondary sources. John Dewey's original works on educational philosophy are available in both printed and electronic forms. Research focused primarily around Dewey's writings on education and his time as director of the famous Laboratory School at the University of Chicago. Such heavy reliance on secondary sources leaves open the possibility that some of Dewey's ideas may have unintentionally been taken out of context or the possibility of perpetuating others misconceptions.

Data about the Stephanie Alexander Kitchen Garden Foundation has been collected from various sources. These sources have included the Foundations' website which is a rich source of information, previous interview transcripts and other published materials. Invaluable advice has also been provided via personal communication with the Foundations NSW project co-ordinator, Derrick Ashby and Stephanie Alexander herself.

A general idea of how an interview may have played out between the characters based on a researched understanding of the participant's philosophies and beliefs has been put forward. Playing the character of the interviewer, my own understandings, beliefs and voice is afforded a distinct place. Inevitably, as author, my voice is also likely to be expressed through the characters of Dewey and Alexander.

The data, analysis and conclusion sections of the thesis have been merged into one and are written in the style of a transcript of a television interview. The structure of arts-based educational research texts are often less conventional than traditional texts in the hope of providing a format that will aid the discovery of enhancing perspectives and raising important educational questions in the minds of the readers (Barone & Eisner, 2006, p.97).

The imagined setting for the transcript is thus:

- an interview has been filmed for the ABC 7.30 report to be aired on television;
- interview participants were; Daniel Brooks, Education Reporter with the 7.30 report, Professor John Dewey and Stephanie Alexander;

- as is customary for the ABC 7.30 report, following the screening of the program, a written transcript of the interview has been placed on the 7.30 report internet site for interested viewers to download; and
- as the imaginary program contained photographs they are included as a part of the transcript.

The working process of the thesis involved reading and taking notes then standing back and trying to identify the links and threads that are underlying and similar between Dewey's philosophies and the Stephanie Alexander Kitchen Garden Foundation. Further note taking and brainstorming sessions took place followed by the writing of first drafts. The draft first scripts were read out loud and work-shopped with friends to try to ensure that they didn't sound artificial or contrived but as much like normal speech as possible whilst containing the required factual data. These drafts were then re-worked and polished.

The American Psychological Association (APA) style of referencing has not been followed in the interview transcript section of the thesis, with a footnote system being adopted instead to allow for a more realistic and authentic 'transcript' style document to be produced. A more free flowing reading experience than that usually afforded by a traditional academic document referenced in the APA style has hopefully been created. As previously mentioned, it is also hoped that this will open the findings of the thesis to a broader audience outside of the academy, including non-researcher educational practitioners, educational policy makers or members of the general public (Barone & Eisner, 2006, p.97). As Finley (2008, p.72) suggests, at the heart of arts based inquiry is a radical, politically grounded statement about social justice and control over the production and dissemination of knowledge, challenging the entrenched claims to scientific ways of knowing.

The following section constitutes the data, analysis and conclusion as an interview transcript.

## EDUCATION EXPERT AND CHEF BOTH CALL FOR MORE KITCHEN GARDENS IN SCHOOLS

Brooks Broadcasting Corporation

Broadcast: 17/06/2009

**Education Reporter: Daniel Brooks.**

[Print](#)

Professor John Dewey, the pragmatic philosopher and a leading thinker on education, and Stephanie Alexander, renowned Australian chef both argue for the use of Kitchen Gardens in schools to teach not only gardening skills, healthy eating choices and social interaction skills but also environmental sustainability skills.

### Transcript

DANIEL BROOKS, PRESENTER: Good evening and welcome to this special edition of the show. We are both honoured and delighted to be joined this evening in the studio by Professor John Dewey, often heralded as the father of the progressive education movement and Stephanie Alexander, founder of the 'Stephanie Alexander Kitchen Garden Foundation' which aims to establish kitchen gardens in schools giving children an opportunity to grow, harvest, cook and share food together as a part of their learning experience.

Welcome to you both and thank you for joining us this evening.

JOHN DEWEY: It's a pleasure.

STEPHANIE ALEXANDER: Thankyou Daniel.

DANIEL BROOKS: Stephanie, reports are now suggesting that we are seeing a growing global childhood obesity epidemic.<sup>1</sup> Does your Kitchen Garden Foundation hope to go some way to addressing this issue?

STEPHANIE ALEXANDER: Certainly, the aim of the Kitchen Garden Program is pleasurable food education for young children. The underlying belief is that by introducing this holistic approach we have a chance to positively influence children's food choices in ways that have not been tried before.<sup>2</sup>

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<sup>1</sup> Wang, & Lobstein, 2006, p.11.

<sup>2</sup> Stephanie Alexander Kitchen Garden Foundation, 2009a, para.1

DANIEL BROOKS: So how does the Program go about trying to influence children's food choices?

STEPHANIE ALEXANDER: Well, a Kitchen Garden is created at the school and a kitchen is also fitted. A garden specialist then has overall responsibility for the planning and maintenance of the garden, and also plans and conducts weekly garden classes in which students learn about growing produce for a kitchen. The Kitchen Specialist plans menus that can be cooked by the children, based on foods that have been grown and harvested in the garden.<sup>3</sup>

We don't ever say things are healthy; it's more subtle than that. It's all about how it tastes and what the texture is and how do they feel about it. It's never, 'Ooohh, you've got to eat this because it's healthy,' because they don't hear that.<sup>4</sup>

DANIEL BROOKS: We have a picture of students at Bittern Primary School helping to construct their Kitchen Garden. Looks like good exercise for them and must develop a real sense of ownership for them being involved from the start?<sup>5</sup>



Fig 2. Bittern Primary School shows children can be involved in the construction<sup>6</sup>

STEPHANIE ALEXANDER: H'mm it does, (nods) It's great how building the garden often draws in both the internal school community and the broader local community and as each garden has compost bays, water tanks and irrigation, greenhouse/hothouse for raising seedlings, a shed, plenty of planting space and rotational beds, and an orchard area, they really learn about the whole cycle of organic gardening.<sup>7</sup>

DANIEL BROOKS: And is the program just a bolt on to the curriculum? I mean, do the children just learn about gardening, cooking and healthy eating choices or is it more than that?

STEPHANIE ALEXANDER: No it's much more than that. We believe that the creation and care of a Kitchen Garden teaches children about the natural world, about its beauty and

<sup>3</sup> Stephanie Alexander Kitchen Garden Foundation, 2009a, para.2

<sup>4</sup> Charles, 2008

<sup>5</sup> Stephanie Alexander Kitchen Garden Foundation, 2009c

<sup>6</sup> Stephanie Alexander Kitchen Garden Foundation, 2009c

<sup>7</sup> Stephanie Alexander Kitchen Garden Foundation, 2009d, para.2

how to care for it, how best to use the resources we have, and an appreciation for how easy it is to bring joy and wellbeing into one's life through growing, harvesting, preparing and sharing fresh, seasonal produce.<sup>8</sup>

The program is also embedded in the curriculum. It is a compulsory part of the school's program for four years of a child's life and incorporates literacy, numeracy and creativity into practical, relevant and easy to handle tasks.<sup>9</sup>

DANIEL BROOKS: Sounds great, I read somewhere that Jamie Oliver brought his trainees over from the UK to learn about the program?

STEPHANIE ALEXANDER: Well, he brought his trainees into one of our schools to witness the Kitchen Garden program in action. He wanted them to see what these young children were doing and because he also believes that ultimately, the key to changing the way children feel about food, is to start to influence them at a very young age, and to actually give them some pleasurable education and experience of fresh food.<sup>10</sup>

DANIEL BROOKS: One might say that you are a bit of a food revolutionary. Can you relate to yourself as a pioneer?

STEPHANIE ALEXANDER: Yes, I'm going to change - I'm definitely going to change - the way we feel about food education in this country. I mean every politician and policy-maker talks about the problem of childhood obesity and talks about the precursor to all sorts of terrible diseases. They all talk about encouraging physical activity - which is excellent - possibly limiting television advertisements - probably excellent. But nobody talks about letting children understand how joyful and how wonderful it can be to work with food in the garden, and to taste food, and to be with other people around a table. These are things that set a path for the rest of their life.<sup>11</sup>

DANIEL BROOKS: Professor Dewey the use of Kitchen gardens as an educational tool is something that you are very familiar with, how did your approach compare with that of Stephanie's?

JOHN DEWEY: Please, call me John. We'll, when I first started my Laboratory school at the University of Chicago in 1896 we used the Kitchen Garden as a part of what we classified 'Nature Studies'.<sup>12</sup> I had originally wanted each group to be taught all subjects by one teacher but soon realised that if the work was to be challenging, stimulating and thought provoking, it should be done by specialists. By 1898 the school was on a departmental basis and there were teacher specialists in literature, history, woodworking, science, physical education, textiles, cooking and music.<sup>13</sup> Similar to Stephanie's program, having kitchen and garden specialists. Today, several teachers still take their children gardening in the neighbourhood, growing some vegetables and some flowers<sup>14</sup> but nothing as integrated as Stephanie's program.

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<sup>8</sup> Alexander, 2006, p.8

<sup>9</sup> Stephanie Alexander Kitchen Garden Foundation, 2009a, para.6

<sup>10</sup> Alexander, 2007

<sup>11</sup> Alexander, 2007

<sup>12</sup> Tanner, 1997, p.2

<sup>13</sup> DePencier, 1967, p.28

<sup>14</sup> Kirkpatrick, 2009



DANIEL BROOKS: We have a photo of children putting in a garden in a city setting for nature study.



Fig. 3 Real Gardens For City Nature Study – Public School 45 Indianapolis<sup>15</sup>

DANIEL BROOKS: I believe that your educational philosophies and work around education and pedagogy<sup>16</sup> were sparked by what you were seeing happening to society following the industrial revolution, is that correct?

JOHN DEWEY: Yes, in terms of catalysts for social change at that time, the industrial revolution overshadowed and controlled all others. One can hardly believe that there had been a revolution in all history so rapid, so extensive and so complete. Through it the face of the earth was making over, population hurriedly gathered in cities, habits of living were altered with startling abruptness and thoroughness. The idea that the industrial revolution should not affect education in some other than a formal and superficial fashion was inconceivable.<sup>17</sup>

DANIEL BROOKS: What habits of living, as you call them, did you feel were being “made over”?

JOHN DEWEY: Well, practical life skills were being lost. There was a lack of understanding of how things were produced and used. Day-to-day things, like making clothing, the local production of flour, timber, food, building materials, household furniture and metal wares.

DANIEL BROOKS: I think that we have certainly seen that trend continue into modern times and we have certainly lost a lot of those skills and connections at a local level. I don’t know many people that make their own clothing and I wouldn’t know where to go to buy locally produced flour.

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<sup>15</sup> Dewey & Dewey, 1915/ 1962, p.97

<sup>16</sup> Pedagogy - Teaching, as a professional practice and as a field of academic study. It encompasses not only the practical application of teaching, or pedagogic skills, but also curriculum issues and the body of theory relating to how and why learning takes place. (Wallace, 2009)

<sup>17</sup> Dewey, 1915/1990, p.9

JOHN DEWEY: Well at the time I felt the loss of these skills was due mainly to the disintegration, under the pressures of industrialism, of traditional institutions such as the home.<sup>18</sup> That's where these skills would have been taught originally. Members of every household would have had responsibility for their share of the work, of producing goods and doing farm work. Discipline and character building are involved in this kind of life and this promotes responsibility and an obligation to produce something in the world.<sup>19</sup> I don't think that we can overlook the importance, for educational purposes, of the close and intimate acquaintance got with nature at first hand, with real things and materials, with the actual processes of their manipulation, and the knowledge of their social necessities and uses.<sup>20</sup>

DANIEL BROOKS: So did you feel it was the responsibility of the schools, as an institution to make up for the losses of these socialisation functions?<sup>21</sup>

JOHN DEWEY: Well as I have already mentioned, human occupations such as cooking, weaving and carpentry were certainly an integral part of the Laboratory School. The activities themselves were seen as leading the children towards understandings in the fields of organised knowledge such as chemistry, geology and maths. Children learned by re-enacting the drama of human development.<sup>22</sup> I felt that the social significance of these skills needed to be seen as types of processes by which society keeps itself going, as agencies for bringing home to the child some of the primal necessities of community life. In short, as instrumentalities through which the school itself shall be made a genuine form of active community life, instead of a place set apart in which to learn lessons.<sup>23</sup>

DANIEL BROOKS: We have a photo of children using carpentry to build a tool shed that we can look at. Do we? – no? oh, yes, there it is.



Fig 4. Tool shed being built by students.<sup>24</sup>

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<sup>18</sup> Zilversmit, 1993, p.6

<sup>19</sup> Zilversmit, 1993, p.6

<sup>20</sup> Dewey, 1915/1990, p.10

<sup>21</sup> Zilversmit, 1993, p.6

<sup>22</sup> Tanner, 1997, p.2

<sup>23</sup> Dewey, 1915/1990, p.14

<sup>24</sup> DePencier, 1967, p.80

DANIEL BROOKS: Not sure how you'd go on with modern OH&S regulations but it certainly looks as though the children are learning a lot of practical, hands-on skills.

JOHN DEWEY: There is a usefulness to this task and while a child does not have much instinct for abstract inquiry, they do have a constructive impulse and an art instinct which can be explored and developed in the practice of such tasks.<sup>25</sup>

DANIEL BROOKS: I think that there may be a few people today that would argue with you about children not having much instinct for abstract inquiry. Indeed, it's possible to find arguments that support philosophy is not too difficult or abstract for young minds.<sup>26</sup>

STEPHANIE ALEXANDER: The belief that society is still losing practical skills has certainly been a motivating factor for me in my work as well and was one of the reasons that I wrote 'The Cooks Companion'.<sup>27</sup>

DANIEL BROOKS: Argh yes, your book 'The Cook's Companion', the 'orange bible' as it's been coined. Reports say it's widely stolen from bookshops, but in spite of that, in spite of all those thefts, it still has recorded sales of 400,000 or so. What accounts for this phenomenon do you think?<sup>28</sup>

STEPHANIE ALEXANDER: Well, I think it actually vindicates what I've always said, which is that a lot of people really have never been taught how to cook and they're sort of bound with anxiety. What I've tried to do in that book is to give really simple, interesting information and make it crystal clear, and I think I've succeeded.

I think there are a lot of adolescents and teenagers and those moving into their first apartment or their first independent household often don't know how to cook.<sup>29</sup>

DANIEL BROOKS: And through the Foundation, you presumably feel that the schools should take on some of these responsibilities?

STEPHANIE ALEXANDER: I do believe that education is at the heart of all progress and that we cannot deal with disadvantage without the help of education, an education that doesn't ignore cultural and social difference or diversity that is.

I also believe that one of the aims of education should be to equip young people for life in the real world. For me, this means that life-skilling has to be part of education. Children should not be able to leave school without an understanding of how to live sustainably, and how to provide for themselves and how to respond to the world of convenience and mass advertising.<sup>30</sup>

DANIEL BROOKS: If we can John, I would like to talk about some of the teaching methods that you used at your Laboratory School.

JOHN DEWEY: Well we tried to ensure that there was to be no break between the child's home activities and his first contact with the school. We wanted children to learn through

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<sup>25</sup> Dewey, 1915/1990, p.44

<sup>26</sup> Hand, 2008

<sup>27</sup> Alexander, 2007

<sup>28</sup> Alexander, 2007

<sup>29</sup> Alexander, 2007

<sup>30</sup> Alexander, 2009

experience – free to move about, communicate with others and get help from the teacher and from his classmates. The psychological reason for starting the child’s education with activities was that the senses would be on the alert due to having to use them to do something. We found it was not necessary to concoct artificial ways of holding children’s attention.<sup>31</sup>

DANIEL BROOKS: But what about reading and writing? How could you teach those skills with children being active?

JOHN DEWEY : Reading, writing, arithmetic and spelling would come later, growing from the children’s need to get information and communicate with others.<sup>32</sup> We also felt that children should learn to live in the present rather than being prepared for adult life in the future. The school would be a community in which the child had a responsible role, instead of just a place for learning lessons from a book. Feelings of success came from being a part of a co-operative enterprise instead of being the winner in a competitive field. One of the weaknesses of schools at that time was that they tried to prepare pupils for social living in a situation where the conditions of social spirit were eminently wanting.<sup>33</sup>

DANIEL BROOKS Did you still focus on traditional outcomes and knowledge though?

JOHN DEWEY: Certainly, but what I did insist upon was that many of these traditional goals could be better achieved if treated secondarily<sup>34</sup>, like we just talked about with reading and writing, every pupil would learn to read, write and spell through an interest in literature and history, learn arithmetic as he needed to learn it for measurements in cooking, sewing, weaving and woodwork.<sup>35</sup> For example, children cooking would weigh the sugar in ounces, measure other ingredients in cups, work with fractions and number facts and learn to read the clock. Garden work may involve planting seeds and experimenting with the effects of different amounts of heat and moisture on germination. Children would prepare and serve luncheon for one another. One favourite I remember was pea soup with boiled rice and cocoa.<sup>36</sup>

DANIEL BROOKS: Stephanie, what curriculum outcomes does the Kitchen Garden Program meet?

STEPHANIE ALEXANDER: Well just as an example and this isn’t a complete list, children learn health, wellness and physical education through being involved in physical activity in the garden for at least 45 minutes a week. Mathematics skills such as measurement, calculation, estimation and comparison and they acquire strategies for thinking, related to investigation, enquiring, processing information, problem solving, using reason, evaluation and reflection. They also learn about society and environment through thoughtful discussion taking place about the geographic origins of dishes and plants.

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<sup>31</sup> DePencier, 1967, p.19

<sup>32</sup> DePencier, 1967, p.19

<sup>33</sup> Dewey, 1915/1990, p.21

<sup>34</sup> Dewey, 1915/ 1990, p.xxxii

<sup>35</sup> DePencier, 1967, p.22

<sup>36</sup> DePencier, 1967, pp.28 -30

They learn about science, environment and sustainability through issues such as climate and climate change, water management, plant cycles and plant diversity, soil health and the avoidance of chemicals.<sup>37</sup>

DANIEL BROOKS: What about reading and writing?

STEPHANIE ALEXANDER: Well communication is essential to the small-group nature of the Program. Reading and understanding technical instructions, expanding vocabulary and exploring language are weekly occurrences in kitchen and garden classes. Listening, speaking, writing, working in teams, working cooperatively and problem solving are all aspects of the work in the garden and the kitchen.<sup>38</sup>

I also think that good teaching helps children make connections between disciplines; see value where perhaps they did not before; and that basic literacy and numeracy can be taught effectively using practical examples that happen in garden and kitchen classes.<sup>39</sup>

DANIEL BROOKS: A lot of what has been mentioned sounds like very sound pedagogy. Your ideas are very similar to the NSW Department of Education and Training 'Quality Teaching in NSW Public Schools' model of pedagogy.<sup>40</sup> For example, under the dimension of significance is the element of connectedness where lesson activities are seen as relying on the application of school knowledge to real-life contexts or problems, and that provides opportunities for students to share their work with audiences beyond the classroom and school.<sup>41</sup>

I think that there is certainly a case to argue that there is 'connectedness' within the program, that is a focus on present or future utility.

JOHN DEWEY: Yes, as a focus of curriculum development, I defend connectedness as a valuable pedagogical strategy.<sup>42</sup>

STEPHANIE ALEXANDER: We reinforce techniques over and over so that the children are actually able to cook simple dishes or plant seeds at home.<sup>43</sup>

I receive so much feedback from parents about children being more active in the kitchen. Parents are saying – "my child never ate green things and now he's making salad." Children also ask for recipes so they can make the dishes at home for mum and dad.<sup>44</sup>

JOHN DEWEY: The difference that appears in enthusiasm when occupations are made the articulating centres of school life is, well, it's not easy to put into words; it is a difference in motive, of spirit and atmosphere. As one enters a busy kitchen in which a group of children are actively engaged in the preparation of food, the psychological difference, the

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<sup>37</sup> Stephanie Alexander Kitchen Garden Foundation, 2009b, para 3

<sup>38</sup> Stephanie Alexander Kitchen Garden Foundation, 2009e, para 7

<sup>39</sup> Alexander, 2009

<sup>40</sup> The NSW DET 'Quality Teaching in NSW Public Schools' model of pedagogy is one model used in NSW and is based on empirical and theoretical research that has shown how teaching and school improvement can promote improved student academic learning outcomes. (Department of Education & Training NSW, 2003b, p.3) (See Appendix C for more information).

<sup>41</sup> Department of Education & Training NSW, 2003a, p.15

<sup>42</sup> Department of Education & Training NSW, 2003b, p.24

<sup>43</sup> Stephanie Alexander Kitchen Garden Foundation, 2009a

<sup>44</sup> Charles, 2008

change from more or less passive and inert reciprocity and restraint to one of buoyant outgoing energy, is so obvious as fairly to strike one in the face.<sup>45</sup>

DANIEL BROOKS: And that's certainly akin to the element of engagement, under the dimension of 'quality learning environment' in the model. The notion that most students, most of the time, are seriously engaged in the lesson, or assessment activity, rather than going through the motions displaying sustained interest and attention.<sup>46</sup>

DANIEL BROOKS: Another area of the NSW Quality Teacher Framework under the dimension of intellectual quality is the element of 'substantive communication', Where children should be regularly engaged in sustained, valuable, conversations about the concepts and ideas they are encountering. It seems there are many opportunities for the students to talk with each other about what they are doing and learning – be it during gardening, cooking or when they sit down and eating the food they have prepared together.

JOHN DEWEY: Engaging in natural conversation is one of the best ways for children to learn a language. If language is taken away from its natural purpose, it becomes a complex and difficult problem to teach. It is not surprising that one of the chief difficulties of school work has come to be instruction in the mother-tongue since the language taught is unnatural, not growing out of the real desire to communicate vital impressions and convictions.<sup>47</sup>

DANIEL BROOKS: Can you explain to us what's happening in this photo John?



Fig 5. A class learns French words and phrases relating to food as they enjoy lunch together.<sup>48</sup>

JOHN DEWEY: This is an illustration of my point. It is a fifth grade class learning French words and phrases relating to food as they enjoy lunch together. It's an example of easy memorisation through meaningful and interesting activities. Foreign language classes have long been a part of the Laboratory schools' curriculum.<sup>49</sup>

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<sup>45</sup> Dewey, 1915/1990, p.15

<sup>46</sup> Department of Education & Training NSW, 2003a, p.13.

<sup>47</sup> Dewey, 1915/1990, pp.55 – 56

<sup>48</sup> DePencier, 1967, p.47

<sup>49</sup> DePencier, 1967, p.47

DANIEL BROOKS: Do you use the shared eating experience in this way Stephanie?

STEPHANIE ALEXANDER: Not to learn French at the moment but it's certainly something that I would be happy to explore. The finished dishes that the children have cooked are arranged with pride and care on tables, set with flowers from the garden, and the shared meal is a great time for students, helpers, teachers and specialists to enjoy each other's company and conversation and to discuss what they have made and how they did it. It is a valuable social experience.<sup>50</sup>

DANIEL BROOKS : We have a photo of a group of children sitting down from the Kitchen Garden Program to look at as well:



Fig 6 Children eating together after harvesting and cooking the food.<sup>51</sup>

DANIEL BROOKS: Looks like a great opportunity for some substantive communication to me (smiles).

DANIEL BROOKS: Just quickly, on classroom management, do you have much trouble with discipline issues? Under the 'students quality learning environment' dimension of the 'quality teaching model' is a thing called 'student autonomy'. It suggests that quality pedagogy enables students to demonstrate autonomy and initiative so that minimal attention to the disciplining and regulation of student behaviour is required.<sup>52</sup>

STEPHANIE ALEXANDER: The students have absolutely total focus - it's wonderful. When they started there was a bit of mad behaviour - a bit of tea towel flicking and that sort of thing. It's all gone. They just rush to the garden "what are we cooking today? What are we doing today?" and they just get on with it.<sup>53</sup>

JOHN DEWEY: I found that out of the occupation, out of doing things that are to produce results, and out of doing these in a social and co-operative way, there is born a discipline of

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<sup>50</sup> Stephanie Alexander Kitchen Garden Foundation, 2009

<sup>51</sup> Stephanie Alexander Kitchen Garden Foundation, 2009f

<sup>52</sup> Department of Education & Training NSW, 2003a, p.13

<sup>53</sup> Alexander, 2007

its own kind and type. Our whole conception of school discipline changes when we get this point of view.<sup>54</sup>

DANIEL BROOKS: I'm interested Stephanie in what you said earlier about the Program providing opportunities for students to, wait how did you put it, argh yes '*acquire strategies for thinking, related to investigation, enquiring, processing information, problem solving, using reason, evaluation and reflection*'. Could you give us a few examples of what the children are doing for the Foundation to make that claim? Only under the 'intellectual quality' dimension of the quality teaching model is the element of 'higher-order thinking' where by students should be regularly engaged in thinking that requires them to *organise, reorganise, apply, analyse, synthesise and evaluate knowledge and information*, they sound similar to me.<sup>55</sup>

STEPHANIE ALEXANDER: Well for problem solving, lets say, if there is an out break of a certain pest species in the garden, it's up to the children to find the appropriate organic remedy or when structures need building for the gardens, like, say a tepee for climbing beans, they have to work out how to build it and all the sizes. In the summer when shade structures are needed to stop things going to seed as quickly, the children work out the sun direction and best placing for the structure to provide shade for the plants and of course in the kitchen, if a certain ingredient isn't available or they don't have the exact quantities they have to work out how to fix the problem.

For investigating, the kids do soil testing of PH and assess what types of soil they have, the water holding capacity and then they learn what they may need to do to better condition that soil for plants to grow. For enquiring, they have to look at what time of year things should be planted and also consider companion planting so look into which plants like to be planted to each other. Have I covered everything?<sup>56</sup>

DANIEL BROOKS H'mm I think you mentioned reflection?

STEPHANIE ALEXANDER: Oh yes, sorry, each student keeps a journal and they do things like draw pictures of seeds, plants, and flowers. They do some poetry, may put some photos in there or make a note of their favourite recipe, that kind of thing.<sup>57</sup>

DANIEL BROOKS: That's certainly a lot of skills that they are building up. I know from personal experience that when you start gardening using organic principles there are a lot of different skills that you need to learn. The nursery work, worm keeping, composting, pest management, planting, harvesting, seed saving, all builds up to provide a big picture to create an understanding of the whole system. And even then you are just embarking on the journey with the basics (laughs). From the quality pedagogy model, this would fall under the significance dimension and the element of background knowledge where tasks explicitly build from students' background knowledge and require students to demonstrate links between old and new knowledge.<sup>58</sup> The number of areas being covered from the curriculum would probably also see the knowledge integration element from the significance dimension being covered as well. It certainly seems that the tasks require

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<sup>54</sup> Dewey, 1915/1990, p.17

<sup>55</sup> Department of Education & Training NSW, 2003a, p.11

<sup>56</sup> Ashby, 2009

<sup>57</sup> Ashby, 2009

<sup>58</sup> Department of Education & Training NSW, 2003a, p.15



students to build from an understanding of the links between and within subjects and key learning areas.<sup>59</sup>

STEPHANIE ALEXANDER: (nods in agreement)

DANIEL BROOKS: Now if we can, I would like to move away from the subject of pedagogy and talk about the notion of schools as agents of social change. John, I understand that your devotion to the idea of continual change and your belief that individuals could play a role in creating a better society gave schools a crucial role in your philosophy?

JOHN DEWEY: Yes that's right.

DANIEL BROOKS: Not everyone agreed with this philosophy at the time though did they? Am I right in suggesting that it stood in direct contrast to the traditional view of the time, that education should be used as a tool to help children become a part of the existing social system, not reform or change it?<sup>60</sup>

JOHN DEWEY: Well I do believe that education is the fundamental method of social progress and reform. All reforms which rest simply upon the law, or the threatening of certain penalties, or upon changes in mechanical or outward arrangements, are transitory and futile. Through education, society can formulate its own purposes, can organize its own means and resources, and thus shape itself with definiteness and economy in the direction in which it wishes to move. I saw the Laboratory School as an 'embryonic community' and felt that the school should become the key to reforming society.<sup>61</sup>

DANIEL BROOKS: But how was this view point received?

JOHN DEWEY: Unfortunately, many public school teachers learned that the idea that progressive teachers should prepare the way for a more worthy, lovely and harmonious society<sup>62</sup> could arouse a great deal of hostility. During the 1930's and the crisis of depression, George Counts challenged teachers to dare to build a new social order, but this aroused a storm of opposition from those who did not want schools to become advocates for social change.

As Carleton Washburne noted, the new social reform agenda that Counts presented to the Progressive Education Association created great difficulties for the public school members of the organisation. I remember him saying that it was difficult to imagine communities that he had examined hiring or retaining teachers who advocated a serious restructuring of American society<sup>63</sup>.

During the 1930's many teachers were still subject to the authoritarian rule of school boards that still told them where to live and what churches to attend. The thought that they could lead major social revolution, may have been slightly unrealistic<sup>64</sup>.

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<sup>59</sup> Department of Education & Training NSW, 2003a, p.15

<sup>60</sup> Zilversmit, 1993, p.17

<sup>61</sup> Zilversmit, 1993, p.6

<sup>62</sup> Dewey, 1915/1990, p.29

<sup>63</sup> Zilversmit, 1993, p.176

<sup>64</sup> Zilversmit, 1993, p.177

DANIEL BROOKS: Slightly unrealistic? It's been said that a flaw in your social reform agenda was its neglect of power relationships. That you did not really have much of a strategy for making American schools into institutions working on behalf of radical democracy and that you often underestimated the strength of the resistance to democratic reforms by the vested interests who were the particular beneficiaries of the existing social habits<sup>65</sup>.

JOHN DEWEY: Well I think that one of the main stumbling blocks is that in individuals, and no less in the cultural community, there is an almost unconquerable dread and dislike of any change which seriously disturbs the habits to which men are accustomed.<sup>66</sup>

DANIEL BROOKS: Did you see yourself as a social revolutionary John?

JOHN DEWEY: I focused on progress, not on revolution, on amelioration, and so my progressivism was basically conservative in philosophy and liberal in activity.<sup>67</sup>

DANIEL BROOKS: Radical critics of American education have pointed out that any program of social reform through education ignores the fact that schools necessarily reflect basic patterns of social organisations and that schools are designed to reproduce, not change, social patterns. These critics see American education as a vast "sorting machine, designed to confirm existing class relationships. Educational reform therefore, they argue, can only be the product, not the cause, of a social change."<sup>68</sup>

Stephanie, do you think that because there is such an interest in good food and cooking now and because your program primarily focuses on childhood eating habits and the obesity problem, not social change, that it made it easier for the Australian government to justify giving the program funding? I mean \$12.8 million to fund kitchen and garden infrastructure in up to 190 government primary schools with infrastructure grants of up to \$66,000 per school is a lot of money.<sup>69</sup>

STEPHANIE ALEXANDER: Yes probably. And the interest in cooking and food in general has come a long way in the last 20 years or so. In the 1980's restaurants were suddenly big news. There was a food media - there hadn't been a food media other than one or two things in local papers before that. Suddenly what chefs did was very important it seemed.<sup>70</sup>

DANIEL BROOKS: A lot of people involved with various environmental movements such as permaculture and Transition Initiatives are now suggesting that to adapt to climate change and peak oil, we must learn to live with a lot less oil – quite possibly a fairly serious shift in societal mindsets and norms. One thing that is often suggested that may need to happen is the relocalisation of food production and a shift towards organic growing methods to reduce the amount of fossil fuel used in food production and a shift in people's diets to eating more seasonally. Stephanie, these all sound like things your program is teaching. Do you see yourself as a social revolutionary?

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<sup>65</sup> Westbrook, 1991, p.109

<sup>66</sup> Martin, 2002, p.494

<sup>67</sup> Martin, 2002, p.199

<sup>68</sup> Zilversmit, 1993, p.177

<sup>69</sup> Stephanie Alexander Kitchen Garden Foundation, 2008

<sup>70</sup> Alexander, 2007

STEPHANIE ALEXANDER: I would love to see Australia become a society where more and more people (not the present say 1%) enjoyed their food lives and embraced many aspects of food procurement. This would involve home gardens, more and more fresh food markets, a wider recognition of what is meant by eating in tune with the seasons, an appreciation of quality, a wider understanding of how to prepare fresh food simply without anxiety, more time relaxing with family and friends around a table, more celebrations that involve people cooking and sharing together, less interest in the worst sort of takeaway food, more children learning how to do these things at school so that they can take their knowledge to their own families. I stress enjoyment of living the good life, not lecturing the world about doom-laden concepts such as Peak Oil, Climate Change, Chemicals in food, even though I accept that these are important issues.

We teach organic gardening because it makes sense in today's world not to pollute and to return usable waste to the soil; but also because it is such a basic way of gardening - dig, feed, plant, care for, water, harvest. It is immediately comprehensible and the knowledge easily transferred to home, now or later. We do not go in for solemn preaching of philosophy in either the garden or the kitchen, our aim is to enchant and engage curiosity, energy and appetite.<sup>71</sup>

DANIEL BROOKS: Well with the program set to be in 190 schools you certainly have the potential to make changes.

JOHN DEWEY: It's great that we are seeing the possibility of some real change happening through the public school system. I always held that the only fundamental agency for good is the public school system.<sup>72</sup>

DANIEL JAMES BROOKS: Well, we have certainly covered a lot of ground tonight and touched on a diverse array of topics. We don't normally do this on the program, but as this is a special edition, we have decided that it would be a good idea to have a wrap up conclusion segment.

One of the most interesting parts of the discussion for me has been how the Kitchen Garden Program potentially aligns with the NSW DET Quality Teaching in NSW Public Schools model of pedagogy. The area of connectedness and lesson activities relying on the application of school knowledge to real-life contexts or problems, and the opportunities for students to share their work with audiences beyond the classroom and school. Students seem seriously engaged in the lesson rather than simply going through the motions, they display sustained interest and attention. There are obvious opportunities for substantive communication and valuable social experience from sharing a nice meal together. Students are able to demonstrate autonomy and initiative so that minimal attention to disciplining and regulation of student behaviour is required by teachers. The Kitchen Garden Program offers opportunities for students to engage in 'higher-order thinking' and organise, reorganise, apply, analyse, synthesise and evaluate knowledge and information and the use of background knowledge where students can demonstrate links between old and new knowledge.<sup>73</sup>

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<sup>71</sup> Alexander, 2009

<sup>72</sup> Dewey & Dewey, 1915/ 1962, p.xxv

<sup>73</sup> Department of Education & Training NSW, 2003a

It seems to be the very nature of the tasks and the way that the program operates that allows for these quality pedagogical elements to be present. In order to substantiate these claims, it would be really interesting for more research to be conducted in this area, maybe with a methodology being developed whereby children are observed engaging in all elements of the program and a scoring system rating to what extent elements of the quality teaching model are present.

John, it's interesting that we seem to have gone full circle with regard to the skills issue. The practical life skills that you identified as disappearing at the beginning of the industrial revolution seem to be the same skills that are required by society at a time where many argue is the end of the industrial revolution.

Stephanie, the skills that your program is teaching, like the nursery work, worm keeping, composting, pest management, planting, harvesting, seed saving, cooking whole foods from scratch, whilst helping to address the problem of childhood obesity and positively influencing children's food choices are also essential practical life skills.

It seems that the Foundation is inadvertently teaching these skills and techniques that are necessary to move towards a more carbon neutral society. These same skills will increase the possibility of the relocalisation of food production and distribution systems and increasing the chances of local food security. Helping communities become more self-reliant, and strengthening local human and community networks.

Ironically, the program doesn't seem to be openly pushing for social change and this may be a good thing. John, as we discussed, when advocates for social change were vocal at the beginning of the 19<sup>th</sup> Century, they were met with hostility.

This seems a subtle, quiet pedagogical approach to social change and probably reduces the element of risk taking for educational leaders. Indeed, when the program is endorsed and heavily financed by the Australian Government, students and parents seem to approve of the program, it is cross curricular and appears pedagogically sound, the element of risk would seem to be significantly reduced for educational leaders.

In terms of the implications for Teacher Education courses at universities, if these programs continue to grow in popularity, it would be useful for units of study to be introduced that equip New Scheme Teachers with the necessary skills of organic food production to help them be adequately prepared before going into schools. Summer and Winter school programs at universities could also be a potential avenue for these courses.

In terms of the effectiveness of the program as an environmental education initiative, a longitudinal study that assessed the sustained effect beyond school that the program has had on both eating habits and environmental attitude or social behavior would be very interesting and valuable.

It may also be useful in the future for the program to be expanded to high schools. There seems to be more than enough potential for the content depth to be scaled up to a high school level. This may also help provide some continuity between primary and secondary schools and maintain a level of familiarity for students.

Well John, Stephanie, I hope that this special edition of the program has gone some way to open up, broaden and deepen ongoing conversation about educational policy and practice

within some of the areas we have discussed. Many areas obviously need more research and we have only started to touch on some of the implications but hopefully it's a good starting point for further discussion and debate.

Unfortunately that's all we have time for. John and Stephanie it's been an absolute pleasure to talk with you both this evening. Thank you very much for joining me on the show.

STEPHANIE ALEXANDER: It's been a pleasure.

JOHN DEWEY: Thank you for having us.

DANIEL BROOKS: And that's Stephanie Alexander and John Dewey. If you would like more information on the Stephanie Alexander Kitchen Garden Foundation, you can visit their website at [www.kitchengardenfoundation.org.au](http://www.kitchengardenfoundation.org.au)

We'll be back with another stimulating program at the same time tomorrow night, if you'd like to look at our website tomorrow, there will be a full transcript of this program available for you to download. I'll see you soon and thanks for watching.

CLOSE

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## Appendix A. Permaculture Principles

### What is Permaculture Design?

The philosophy of Permaculture is to reduce the impact that human settlements have on non-renewable and renewable resources, while creating an abundant living environment, catering to the needs of all living creatures.

Permaculture is said to be a science developed through the observation and analysis of natural systems. It is believed that through this analysis set structural patterns common to all natural systems emerge. Permaculture design then applies these “Patterns” to the development of sustainable human settlements, harmoniously integrating landscape and people while providing food, energy, shelter, and other material and non-material needs in a sustainable way. (Tagari Publications, n.d., para.1)

### Permaculture Ethics

- **Earthcare** – recognising that Earth is the source of all life (and is possibly itself a living entity (Gaia theory), that Earth is our valuable home, and that we are a part of Earth, not apart from it.
- **Peoplecare** – supporting and helping each other to change to ways of living that do not harm ourselves or the planet, and to develop healthy societies.
- **Fairshare** (or placing limits on consumption) - ensuring that Earth's limited resources are used in ways that are equitable and wise.

(Mollison, 1988, p.2)

### Twelve design principles of Permaculture

1. **Observe and interact** - By taking the time to engage with nature we can design solutions that suit our particular situation.
2. **Catch and store energy** - By developing systems that collect resources when they are abundant, we can use them in times of need.
3. **Obtain a yield** - Ensure that you are getting truly useful rewards as part of the work that you are doing.
4. **Apply self-regulation and accept feedback** - We need to discourage inappropriate activity to ensure that systems can continue to function well.
5. **Use and value renewable resources and services** - Make the best use of nature's abundance to reduce our consumptive behaviour and dependence on non-renewable resources.
6. **Produce no waste** - By valuing and making use of all the resources that are available to us, nothing goes to waste.
7. **Design from patterns to details** - By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
8. **Integrate rather than segregate** - By putting the right things in the right place, relationships develop between those things and they work together to support each other.

9. **Use small and slow solutions** - Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.
10. **Use and value diversity** - Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
11. **Use edges and value the marginal** - The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
12. **Creatively use and respond to change** - We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

(Adapted from Holmgren, 2002)

## **Appendix B - Peak oil**

The notion of peak oil has been around for some time although as yet has not attracted the same media attention as climate change.

Global oil discoveries have been declining since the 1960s (the peak year for discovery of new oilfields was 1964). The U.S. passed its moment of peak production in 1970, and since then many more nations have entered the decline phase of their oil production history (Heinberg & Bomford, 2009, p.6)

In 1998, Campbell and Laherrere writing in the *Scientific American* predicted the ‘end of cheap oil’, noting that *Global production of conventional oil will begin to decline sooner than most people think, probably within 10 years* (p.78)

Writing in *Energy Policy* journal in 2002, Bentley estimated that the physical peak of global conventional oil production would be in between 5 and 10 years from 2002. He noted that ‘shortages are inevitable unless radical changes occur in demand, or in the supply of non-conventional hydrocarbons’ (p.189).

Peak Oil is not about “running out of oil”. There will always be oil left in the ground because either it's too hard to reach or it takes too much energy to extract. Peak Oil is about the end of cheap and plentiful oil, the recognition that the ever increasing volumes of oil being pumped into our economies will peak and then inexorably decline. It's about understanding how our industrial way of life is absolutely dependent on this ever-increasing supply of cheap oil (Hopkins, 2009, p.11)

The International Energy Association is an autonomous body under the OECD formed in 1974. Their ‘World Energy Outlook 2008’ report opens with the following statement:

The worlds energy system is at a crossroads. Current global trends in energy supply and consumption are patently unsustainable – environmentally, economically, socially..... It is not an exaggeration to claim that the future of human prosperity depends on how successfully we tackle the two central energy challenges facing us today: securing the supply of reliable and affordable energy; and effecting a rapid transformation to a low-carbon, efficient and environmentally benign system of energy supply. What is needed is nothing short of an energy revolution.

(International Energy Agency,2008, p.3)

## Appendix C.

### The NSW Department of Education & Training ‘Quality Teaching in NSW Public Schools’ model of pedagogy

#### *Dimensions of the Model*

Three dimensions of pedagogy in NSW public schools are Quality Learning Environment, Intellectual Quality and Significance (Department of Education & Training NSW, 2003a, p.8)

**1. Intellectual quality** refers to pedagogy focused on producing deep understanding of important, substantive concepts, skills and ideas. Such pedagogy treats knowledge as something that requires active construction and requires students to engage in higher-order thinking and to communicate substantively about what they are learning.

**2. Quality learning environment** refers to pedagogy that creates classrooms where students and teachers work productively in an environment clearly focused on learning. Such pedagogy sets high and explicit expectations and develops positive relationships between teachers and students and among students.

**3. Significance** refers to pedagogy that helps make learning meaningful and important to students. Such pedagogy draws clear connections with students’ prior knowledge and identities, with contexts outside of the classroom, and with multiple ways of knowing or cultural perspectives.

(Department of Education & Training NSW, 2003a, p.9)

#### *Elements of the NSW model*

Each of the three dimensions of pedagogy can be described in terms of a number of elements. Each element has been selected and defined on the basis of:

- a sound and reliable research base linking the practices or qualities of the element to improved student learning outcomes
- the practical capacity of each element to act as an indicator of the underlying dimension.

	<b>Intellectual quality</b>	<b>Quality learning environment</b>	<b>Significance</b>
<b>Elements</b>	Deep knowledge	Explicit quality criteria	Background knowledge
	Deep understanding	Engagement	Cultural knowledge
	Problematic knowledge	High expectations	Knowledge integration
	Higher-order thinking	Social support	Inclusivity
	Metalanguage	Students’ self-regulation	Connectedness
	Substantive communication	Student direction	Narrative

(Department of Education & Training NSW, 2003a, p.9)