Community Environmental Empowerment

Banksia Gardens Community Centre

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Abstract

The Banksia Gardens Community Centre in Broadmeadows, Victoria, Australia seeks to educate and empower the youth of the Centre to adopt sustainable practices through its new Edu-Eco Link program. Based upon extensive consultation with the Broadmeadows youth and their mentors, our team established program design principles and developed a menu of suggested lesson plan options for the Centre. The program entails excursions, discussions and experiments which link local and global climate-change issues, culminating in participants' creation of an informative video.

Acknowledgements

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Executive Summary

In the next century, Australia expects to see severe droughts, more frequent bushfires, and mass extinction of native species due to the harmful effects of climate change. Our project addressed the threats of climate change on a community scale by using environmental education to unite the youth at the Banksia Gardens Community Centre. Our team delivered a framework and specific activities for the new Edu-Eco Link program within the Banksia Eco-Warriors, an initiative at the Centre which promotes sustainability in the local area. The Edu-Eco Link Program aims to provide interactive activities that encourage the young people to make environmentally conscious decisions to take a stand against climate change.

We used interviews, discussion groups, and observational journals to better understand and empower the youth of Banksia. Our interviews with mentors, local adults who work with the youth, and discussions with the young people themselves allowed us to create engaging lesson plans that raise environmental awareness and promote sustainable activities. These consultations aimed to determine:

- Which topics of sustainability the young people already knew and which they were most interested in learning more about
- Why the students choose, or choose not, to participate in environmentally friendly practices
- Which educational approaches were effective to educate and engage the students on sustainable living

Our team integrated the information we collected with best practices drawn from the educational literature to create a set of design principles that guide the choice of content and the

approaches to environmental education for the youth of Banksia. We found that the young people have mixed environmental interests; programs should therefore include all four topics of sustainability: waste, water, energy and biodiversity. Hence, one design principle recommends that programs should include a variety of interactive, age-appropriate approaches to teach the youth about simple, low-cost activities they can use to be more sustainable. Other principles recommend that programs have a flexible structure and include opportunities to work individually as well as in groups. The information provided to the young people should begin at a tangible, local level before expanding into the complexities of global sustainability. Since the young people were found to have only a minimal understanding of climate change, the content of the Edu-Eco Link program should begin with the fundamentals of climate change.

These design principles, the product of our educational research and community consultations, are easily adapted to the development of future programs at the Centre. They can serve as the basis for much more than just the Edu-Eco Link program described in our report.

Table 1.1 Selected Edu-Eco Link Program Activities

We proposed a nine-week program for the Banksia Gardens Community Centre. It consists of seven units which incorporate many learning styles and activities. Table 1.1 displays a menu of possible activities within each unit. Choosing the activities highlighted in blue, for example, provides a program whose total cost is about $17 per participant, which is inexpensive compared to other programs at the Centre.

Partnerships with local schools and government can expand the base of participation and enhance community support. The program also incorporates a system of rewards, which recognize those involved for their commitment. Overall, the framework for the Edu-Eco Link program which we provided will empower its participants through education to decrease the harmful effects of climate change and to better their community.

1. Introduction

In 2007, the Intergovernmental Panel on Climate Change (IPCC) claimed that the "warming of the climate system is unequivocal" (Solomon et al., 2007). Greenhouse gases, or GHGs, are likely worsened by human activity (Solomon et al., 2007) and absorb heat from the sun which subsequently increases temperatures (Australian Government: Department of Climate Change, 2009). Impacts of these rising temperatures in Australia may include long-term droughts which contribute to devastating bushfires (Murphy & Timbal, 2008) as well as species endangerment and extinction (Hughes, Cawsey, & Westoby, 1996).

The Australian government has been committed for the past two decades to reducing the impact of human activities on the environment (Australian Government, 1999). Despite these efforts, one observer has said "If everyone lived like an Australian, we would need almost four planets to support our resource consumption and cope with our waste and pollution" (Perez, 2008). Climate change is a pressing concern and will get worse in the future unless sustainable behaviours are adopted (Abbott, 2010).

Unfortunately, it is more difficult for those of lower socioeconomic status to recover from the consequences of climate change, and the heightened cost of sustainable actions can hinder their involvement (Wood, 2007). However, education can be utilized to inform the economically disadvantaged of inexpensive sustainable actions which can mitigate climate change. Environmental education can achieve a systematic change that moves beyond awareness and promotes long-lasting attitudinal and behavioural changes (Australian Greenhouse Office, 2005).

The Banksia Gardens Community Centre, located in Broadmeadows, Victoria, is promoting sustainable practices with its community programs. Through its Eco-Warriors

initiative, the Centre is being remodelled in a way that minimizes its environmental impact and reduces energy consumption (Banksia Gardens Community Centre, 2009). However, such sustainable values are not fully communicated to the young people in the community. The Centre's new Edu-Eco Link program will provide education that encourages changes in attitude and pro-environmental behaviour.

This project established a framework for the Edu-Eco Link program that is designed to empower young people through an interactive, hands-on curriculum on climate change and sustainability. In order to create a program tailored to the youth of the Broadmeadows community, we interviewed individuals who conduct youth programs at the Centre or nearby, recorded our observations of the behaviour of young people in a qualitative journal, and held discussion groups among students in local classrooms. These activities characterized the young people's environmental interests, prior knowledge of climate change, motives for participating in pro-environmental behaviours, and preferred educational approaches. From the results of this outreach, we created a set of programs and content design principles for environmental lessons within the Eco-Link program at Banksia. To implement these principles, we also developed a variety of practical teaching and learning activities within a nine-week program. These engaging approaches link the tangible, local impacts of environmental degradation to the global issues of climate change through engaging learning activities.

2. Background

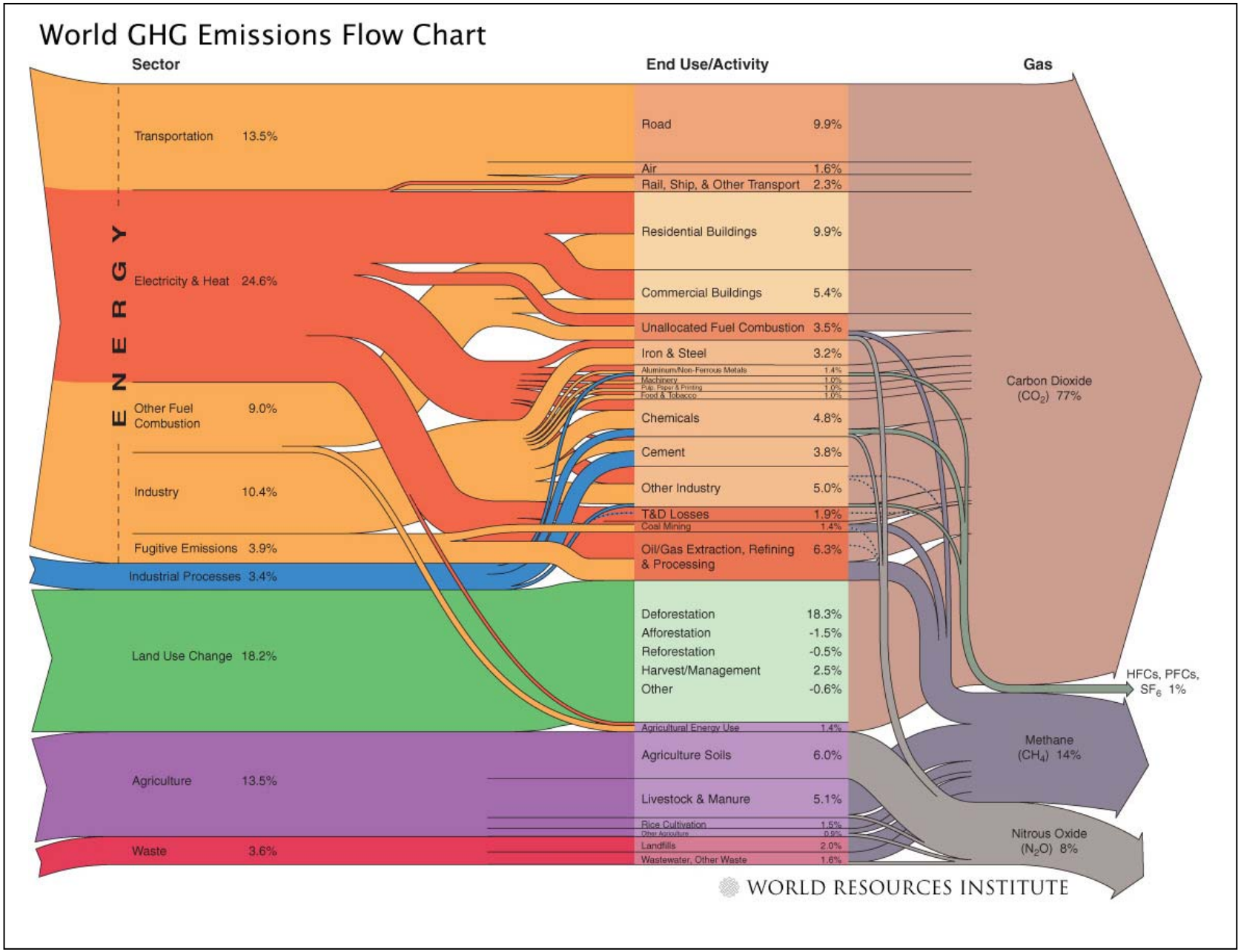
2.1 Introduction

Our project seeks to empower the Broadmeadows community through environmental education to adopt sustainable environmental practices, those that reduce the impact of climate change on future generations. Climate change is the fluctuation of global temperatures and has contributed to droughts and bushfires in Australia. (Preston, B.L.) To mitigate the harmful effects of climate change, we hope to empower young people to adopt more sustainable behaviours. In this chapter, we argue that, for our purposes, empowerment means providing people with the resources to make informed decisions. Developing engaging approaches to environmental education will give the youth of the community information which they may utilize in their future actions. We will connect these concepts to lay a foundation for our approaches to empower the young people through environmental education.

2.2 Climate Change and Sustainable Practices

The Earth's climate is altering as "…the result of changes in our weather patterns because of an increase in the Earth's average temperature" (Australian Government: Department of Climate Change, 2009). The rise in temperature is caused by excessive amounts of greenhouse gases (GHGs) accumulating, which impede the release of the sun's heat back into the atmosphere (Australian Government: Department of Climate Change, 2009). Human activity is widely believed to increase the concentration of GHGs (Australian Government: Department of Climate Change, 2009). Figure 2.1 details specific human activities that are the major contributors to GHG emissions. Possible consequences of such emissions include the sea level

Figure 2.1 Causes of Greenhouse Gasses (World Resources Institute, 2000)

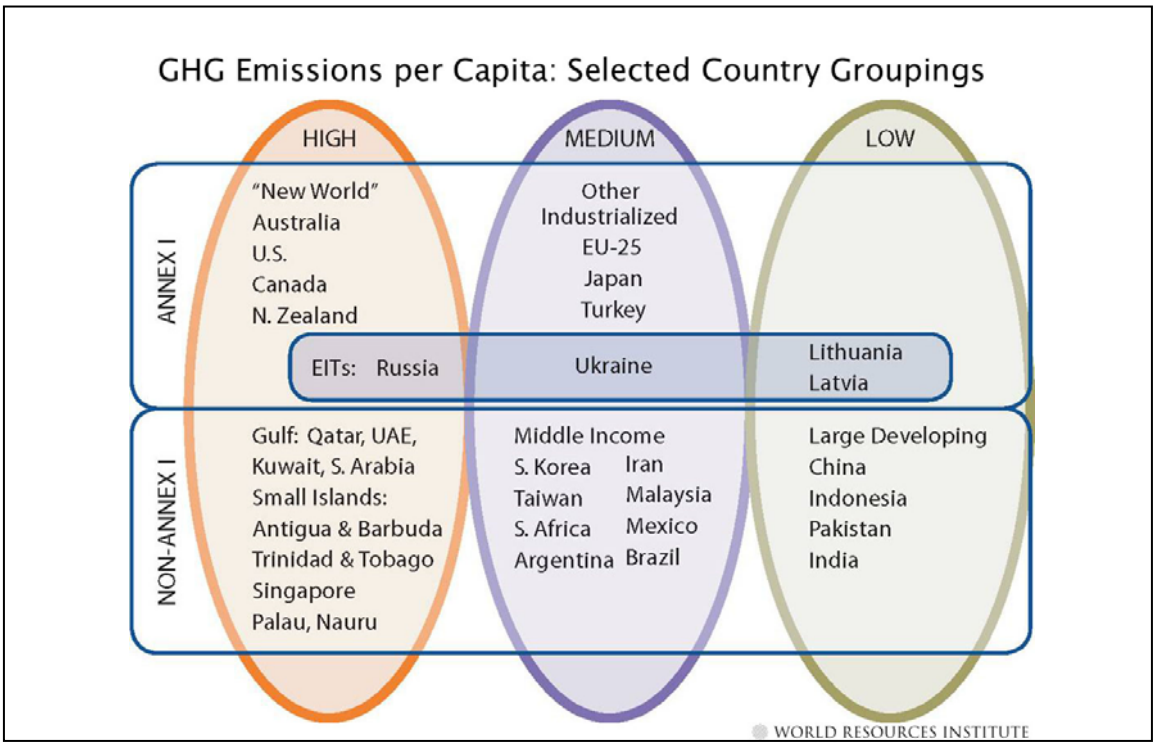


rising from melting ice caps, irreversible ecosystem changes, and more extreme climate conditions such as severe storms, winds, floods, and droughts (Total Environment Centre, 2009)

2.2.1 The Threat of Climate Change in Australia

Although the Australian production of GHGs is higher than the average of other countries, as seen in Figure 2.2, its government has signed Annex I of the Kyoto Protocol, thereby committing it to reduce GHG emissions nationwide (UNFCC, 2009). Three-quarters of the world's greenhouse gases are emitted by major cities (Doyle, 2009), including Melbourne which produces greenhouse pollution higher than both the state and national averages (Australian Conservation Foundation, 2009).

Figure 2.2 Worldwide Emissions Comparison



Evidence of the harmful effects of GHGs has recently been experienced in the Melbourne area (Preston & Jones, 2005). Among the effects, an extremely long drought has plagued the area

for more than ten years (Murphy et al., 2008). The change in rainfall affects the environment with catastrophes including disastrous bushfires which are difficult to contain and cause widespread devastation (Murphy et al., 2008). Another impact of the extended drought is the threat of species endangerment and extinction (Hughes et al., 1996).

The consequences of GHG emissions can be mitigated through changes of behaviour to those which are described as *sustainable*. The World Commission on Environment and Development explains sustainability as "... that [which] meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Greneseo, 2009).

Unfortunately, unsustainable practices are affecting poor people "…first and worst … despite them being least responsible" (Oxfam, 2010). The impoverished often find that the most effective mitigation strategies require a sizable investment that they cannot afford (Wood, 2007). Likewise, the economically disadvantaged find it more difficult to recover from and adapt to severe effects of climate change (Wood, 2007). However, there are many cost-effective ways through which individuals can decrease their contributions to Australia's GHG emissions, including:

- Setting the thermostat between eighteen and twenty degrees Celsius in the winter months (A Victorian Government Initiative, 2007c)
- Using fans instead of air conditioning units (A Victorian Government Initiative, 2007b).
- Keeping showers brief (A Victorian Government Initiative, 2007a).

Simple sustainable practices like these can help people take action against climate change, but first they must acquire the appropriate tools and information to do so.

2.3 Empowerment to Address Climate Change

Empowerment is the process of providing people with the information and tools needed to make informed decisions regarding the future of their lives (Communities and Local Government, 2009). Empowerment is linked to climate change because communities can undertake and localize pro-environmental practices to improve their environment (Adamson & Bromiley, 2008). Involving "local people in local decisions" on environmental issues provides a better sense of community involvement which will yield more significant results (Communities and Local Government, 2009). Important aspects of community empowerment will be described next, including social justice, communication, participation, and education.

Social justice is the concept of ensuring that all human beings have choices about their lives and the means to make those choices. Social justice also involves recognizing the distinct rights that human beings hold (Australian Human Rights Commision, 2009). These distinct rights, also called human rights, are believed to be given to all human beings at birth and "…they are the basic standards required for governments, societies, and communities to operate in a respectful and peaceful manner" (Victorian Equal Opportunity & Human Rights Commission, 2009). Approaching sustainability through local empowerment and social justice provides a greater good through the protection of the environment.

Empowerment requires communicating information in a way which allows the power of choice without mandating a specific process. For example, Fischhoff (2007) suggests that scientists who idly assume the public will understand and take interest in research concerning climate change are comparable to persons "…shouting at people who speak a different language". Information provided to a community for empowerment must be catered to the average concerns and values of the members and in a format which will engage them (Apt &

Fischhoff, 2006). Also, research must be appropriately summarized for the general public in order for the members to fully understand the material and utilize the results. Subsequently, the public will be able to make use of the information to catalyse changes (Fischhoff, 2007).

Unless information is properly communicated and all individuals are involved in the decision making process, people can feel powerless and unwilling to participate in social initiatives (Communities and Local Government, 2009). Furthermore, individual behaviour can be influenced by the rest of the community's participation in a program. One example of this is seen in the Kerbside Recycling Program in the UK (Kurz, Linden, & Sheehy, 2007; Nigbur, Lyons, Uzzell, & Muckle, 2005).

Cuthill (2002) suggests that education is the most important part of empowerment. To assist a group in educating itself, one must first have a deep understanding of the individuals within. Those individuals who are empowered through education develop the ability, confidence, and motivation to succeed academically (Cummins, 1986). Individuals who are disempowered or 'disabled' by their learning experiences do not develop these intellectual traits. Therefore, education is an integral component of empowerment, particularly of empowerment to promote sustainability (Cuthill, 2002). Environmental education can have a significant impact on a community's response to climate change (Preston & Jones, 2005).

2.4 Empowerment Through Environmental Education

Just as information is essential to empowerment, community education is vital to raising environmental awareness (Preston & Jones, 2005). Environmental education can raise awareness on sustainability and assist individuals in making social changes (Cuthill, 2002). Environmental education provides information and tools which young people may use to assess their current

behaviours and make informed decisions in the future (Kollmuss & Agyeman, 2002). Presenting information in a community setting, such as the Banksia Gardens Community Centre, is an essential component of empowerment.

2.4.1 Community Education Programs for Empowerment

Education in a community setting can be an effective approach to teach young people about climate change. Structured community-based learning programs empower those involved, promoting life-long learning and "…the ability of the community to influence, share and/or control the decision-making process" (Tilbury, 2004, p. 107). Knowledge gained through the community is often more influential than classroom approaches to environmental education. However, environmental education is a big part of formal education in Australia (further information on environmental education in Australia can be found in Appendix A).

Community education for sustainability must have several characteristics to be effective. Community-based learning must address concerns which directly relate to that specific community (Cuthill, 2002). After such grounding, the focus can then expand to more global concerns and still retain the interest of the community members (Sumner, 2003-10). Although each community may have different interpretations of which environmental issues affect it the most (Alvarez & Rogers, 2006), rooting the knowledge in local communities draws upon personal experiences, which provide a greater sense of empowerment to those involved (Reeler, 2005).

Educational materials should build upon the student's previous knowledge to avoid redundancy and retain interest (Alonso, Lopez, Manrique, & Vines, 2005). Halsey (Halsey, 2009-07) argues that interest lies in education focusing on universal environmental issues such as the need for water, food, energy, land, and natural resources. Focusing on these basic human

needs can encourage the public to refrain from unsustainable practices. Researchers have also pinpointed three areas with which school-aged children are most concerned (Strong, 1998):

1. Environmental factors which lead to climate change on a global scale
2. Local environmental issues that are linked to their own community and may directly impact their lives
3. The extinction and endangerment of wildlife

Educational programs can benefit from focusing on these specific interests. By addressing the interests of the Broadmeadows Community and furthering their current knowledge, effective educational methods can be chosen for the Edu-Eco Link program.

Students can also learn through projects that enable them to interact with the community members. A project at Royal Melbourne Institute of Technology (RMIT) University encouraged students to travel to local farms to understand the scope of the term 'sustainability' (Alvarez & Rogers, 2006). Through conversations with the farmers, the students discovered that sustainability is viewed differently by each person, and that there is no single set of practices uniformly applicable to all. Through this project, the RMIT students found that the concept of sustainability was better understood through community interactions then in the classroom (Alvarez & Rogers, 2006).

At Washington State University, a program in partnership with the community was also viewed as more effective than traditional teaching methods. The program "…informally educate[d] local community members in the application of horticultural science for the sustainable management of landscapes and gardens" (Chalker-Scott & Tinnemore, 2009). The students educated community members to conserve water, protect the habitat, and reduce chemical usage, and then asked them to pass this knowledge on to others. The project found that

sustainable gardening is more effectively learned and spread through hands-on, interactive experiences within the community.

2.4.1.1 Community Education at the Banksia Gardens Community Centre

The Banksia Gardens Community Centre, located in Broadmeadows, Victoria, encourages community based learning "…to serve the needs of [its] diverse range of local people" (Banksia Gardens Community Centre, 2009). The Centre addresses climate change with the Eco-Warriors Program, which seeks "...to make highly visible modifications to [the] Centre and to current programs and operations in order [for the Centre] to become more environmentally sustainable" (Banksia Gardens Community Centre, 2009). Current initiatives under this program include creating a community garden on site that utilizes grey water systems, using eco-friendly cleaning products, encouraging recycling, and distributing water-conserving shower heads in the community.

The Eco-Warriors project plans to expand by creating the new Edu-Eco Link program, which "...will be based around...the development of learning materials and activities related to specific scientific, social and environmental subjects" including waste, water, biodiversity and energy (Wood, 2007). Our project will create design principals and lesson plans for the Edu-Eco Link program by incorporating environmental content and educational approaches which engage young people in the Broadmeadows area.

2.5 Teaching Methods for Environmental Education

A variety of methods should be used to gain the most knowledge, including interactive, horizontal and A-frame learning. A study in Zakynthos, Greece evaluated teaching methods by presenting material on a local environmental concept through fifteen different approaches,

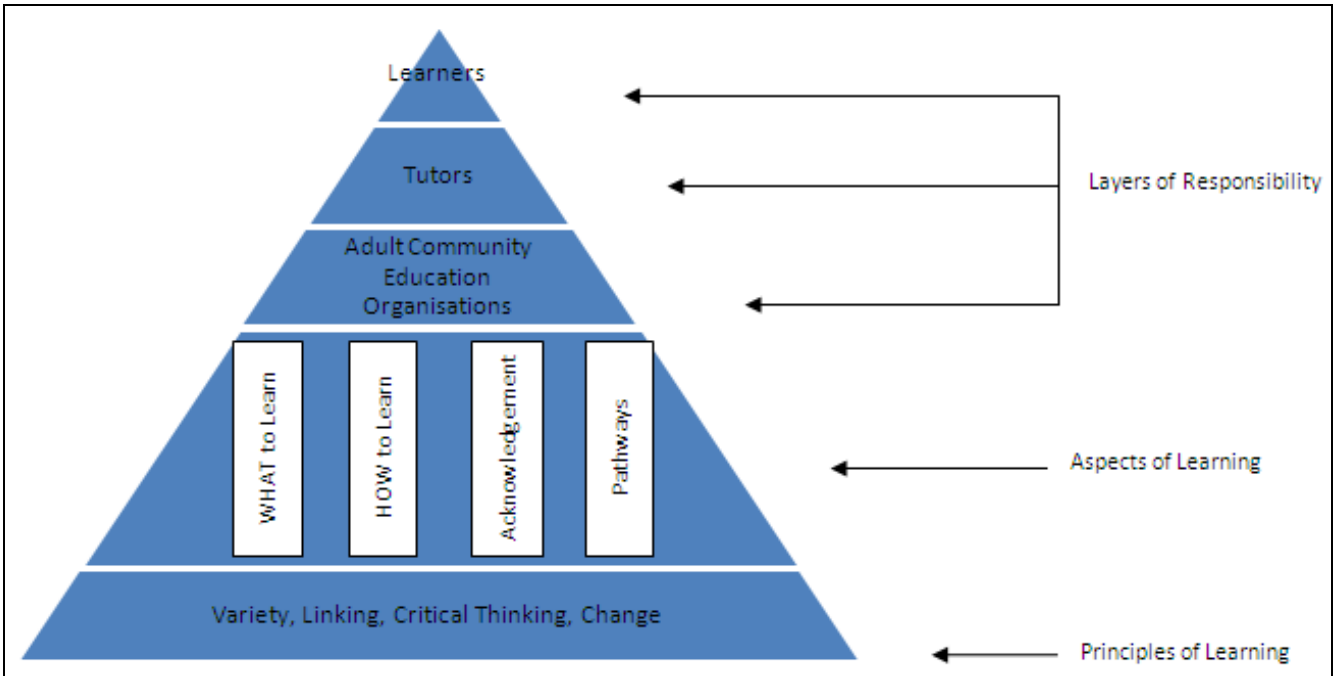
including presentations, research, discussions, take-home materials, games, and role playing (Dimopoulos, Paraskevopoulos, & Pantis, 2008). After participating in all fifteen activities, the students' knowledge, based on a multiple choice questionnaire, displayed an increase by over 90% (Dimopoulos et al., 2008). These results suggest that a variety of approaches to a topic can provide a large increase in the students' knowledge on that topic.

Among a variety of teaching methods, interactive and horizontal learning are approaches which can be effective to increase knowledge on environmental issues. Interactive learning is gaining knowledge through first hand experiences, typically involving some type of equipment or computers (Beam, 2010). Beam believes that interactive learning is best for science education, including environmental topics which will be addressed by the Edu-Eco Link program. Horizontal learning is defined as gaining knowledge on a concept through the shared experiences of peers, such as group storytelling (Reeler, 2005) (Beam, 2010). Two examples of horizontal learning are detailed earlier in *Section 2.3*: defining sustainability at RMIT University (Alvarez & Rogers, 2006) and the community gardens at Washington State University (Chalker-Scott & Tinnemore, 2009). Participants are more likely to contribute in horizontal learning because there is no intimidation from an expert or teacher (Reeler, 2005) and therefore horizontal learning is an effective approach for education of the Broadmeadows community.

A-frame learning is another method of community based learning which can be applied to the Edu-Eco Link program. A-frame learning is a structured process for documenting educational practices designed to save time, provide consistency, and improve quality. As well as an overall framework, it includes practical tools for planning and documenting learning programs (CAE, 2006). A conceptual framework of the A-frame model can be organized into a

triangle as seen in Figure 2.4. The model guides practices, supports quality, measures results, strengthens learners and communities, and encourages positive outcomes.

Figure 2.3 A-frame Conceptual Framework* (CAE, 2006)



*The Learners participate in a course which addresses their personal, community and employment needs The Tutor delivers the course considering the community, employment, and learner and provides support. The Adult Community Education (ACE) Organisations research possible delivery of a course based on the community, employment, learner and tutor. The A-frame system uses a curriculum matrix broken down into the four sections of WHAT to Learn, HOW to Learn, which forms of Acknowledgement are appropriate, and which Pathways the learning will lead to. Each section is then broken down into questions and topics of how each section interacts with learners, tutors, ACE organizations, aspects of learning, considerations and curriculum principles.

As discussed in this section there are many methods to educate a community on environmental awareness including interactive, horizontal and A-frame learning. Each method has a unique way of engaging its audience however a combination of the different methods would be the best way to increase knowledge on climate change for the young people at the Banksia Gardens Community Centre.

2.6 Background Chapter Summary

Human activities are contributing to the increase of GHG emissions. In Australia, these emissions will eventually change the climate to increase the likelihood of extreme weather conditions, such as droughts and consequent bushfires. Sustainable practices on a community scale can help mitigate the effects of climate change. Within Broadmeadows, the issue of sustainability can be addressed by providing the young people at the Banksia Gardens Community Centre with knowledge to make a social change. The most important component of such empowerment is education, and community education has been proven the most effective method to teach environmental topics. The Edu-Eco Link program will use varied, interactive approaches toward sustainability which build off previous knowledge and are catered to the community's interests. With this program, the young people of Broadmeadows will be empowered for a greener future.

3. Research Methods

3.1 Introduction and Project Objectives

The main goal of our project was to establish an effective way to raise environmental awareness through the creation of educational resources for the Edu-Eco Link program. In order to accomplish this goal, our priority was to better understand the unique Banksia community by addressing the following three research questions:

- What topics in sustainability do the young people in Broadmeadows want to learn more about and what do they already know?
- Why do the young people choose, or choose not, to participate in environmentally friendly activities?
- What are the most suitable approaches to engage young people in environmental education?

To evaluate these questions, we used discussion groups, observational journals and interviews with members of the Broadmeadows Community as described in the following sections.

3.2 Approaches, Populations, and Project Timeline

Our research utilized qualitative methods because they best explain "…why people think and act as they do" (Kalof & Dan, 2008, p. 80). These methods were applied over a period of seven weeks and addressed two separate populations: the young people of Broadmeadows and the mentors who interact with them.

3.2.1 Youth Discussion Groups and Observational Journal

We conducted discussion groups with collections of young people in local schools and at the Banksia Gardens Community Centre. Discussion groups are effective in getting responses in a timely manner from a large audience (Knight, 2002). In addition, discussion groups are useful because they allow the participants to build upon or refute others' suggestions (Bernard, 2000).

We developed our questions to avoid distortion effects and expectancy effects on the discussion groups, as when a research team signals specific expectations of what it wants to achieve and distorts the interview to gain those results (Bernard, 2000). The questions we created did not lead the participants towards desired answers, and were open-ended to allow for elaboration (Green, Camilli Gregory, & Elmore, 2006).

For our discussion groups, we stimulated the participation of the young people to respond to our questions by using the tactic of probing (Easterby-Smith, Thorpe, & Lowe, 1991). This tactic had to be carefully used to avoid forcing our opinions on the respondents. While Easterby-Smith *et al.* mention there are many types of probing, for our purposes we primarily used the basic, explanatory, focused and silent probes. We created the questions by elaborating on our research objectives and based them upon previous interview questions for high school students (Northern Climate Exchange, 2009). We began our sessions with general questions to initiate the discussion and make the participants feel comfortable (Fagerheim & Weingart, 2005). The questions themselves appear in Figures 3.2, 3.4 and 3.6.

We involved four classrooms of young people in our discussion groups. These classes provided a sample of our target population for the Edu-Eco Link program: young people from ages ten to twenty-five in the Broadmeadows area (Wood, 2007). We held discussion groups with the following classes:

- Kangan Batman Victorian Certificate of Education (VCE), Sociology, Year 12
- Kangan Batman VCE, Sociology/Philosophy, Year 11
- Broadmeadows Valley Primary, Year 5-6
- Banksia Gardens After School Program, Ages 14-20

To assess the same population, we also kept a qualitative journal of our observations of the young people at the Banksia Gardens Community Centre. Qualitative journals capture observations relevant to research and discuss conclusions to be drawn from observations (Kalof & Dan, 2008). There was valuable information to be collected from our interactions with the young people at the Centre, and we obtained this information by recording our observations during the Youth Development Holiday Programs, the 19th through the 30th of January, 2010.

3.2.2 Mentor Interviews

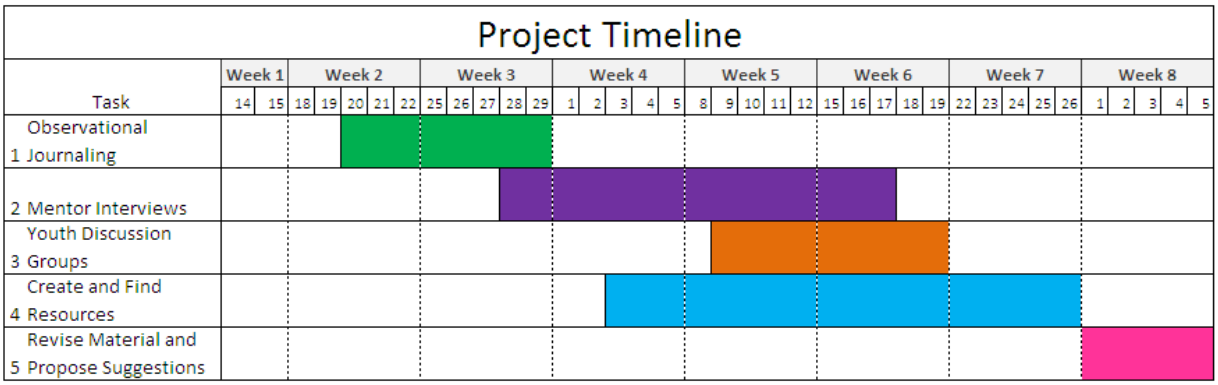
To help us frame productive educational approaches, we conducted semi-structured interviews with mentors in Broadmeadows. Interviews are useful tools in qualitative research because they allow subjects to share their professional opinions and personal perspectives in a flexible setting (Bilken & Bogdan, 1982). Our questions were designed to permit open responses and to avoid leading the interviewee toward any specific answer (Bernard, 2000). We utilized this unrestrained quality to enable mentors to freely express their thoughts on the topic.

The only defined framework in a semi-structured interview is the use of a list of questions and topics known as an interview guide (Bernard, 2000). The interview guide used in our research is described in relation to each research question later in this chapter in Figures 3.3, 3.5 and 3.7. The questions in this guide were drawn directly from each of our research objectives (Fagerheim & Weingart, 2005) and were created following the same guidelines as our discussion groups (Green et al., 2006).

To choose whom we would interview, we drew from mentors within the Broadmeadows area involved with youth education. At the Banksia Gardens Community Centre, we conducted interviews with staff members, tutors, and childcare educators because they are familiar with the young people at the Centre, towards whom our programs are aimed. In the local community, we interviewed a Project Team Leader at the Centre for Education and Research in Environmental Strategies (CERES) to collect information and inspiration from their already developed youth programs (CERES, 2009).

All of the previously mentioned research was completed in January and February 2010 as seen in Figure 3.1. Each method contained questions addressing our three research objectives. These objectives built upon each other to create educational resources appropriate for the Banksia Community.

Figure 3.1 Project Timeline



Using the previously described approaches, we established tools suitable for conducting our research. In the next three sections, we explain the implementation of our methods, beginning with determining environmental interests and knowledge of the Broadmeadows youth.

3.3 Building a Basis: Uncovering Interests and Prior Knowledge

Our first research objective laid the foundation for the content of the Edu-Eco Link program by identifying the topics of sustainability youths want to learn more about as well as their prior knowledge about the environment. This objective was critical to the development of the program because discovering the current state of understanding allowed our educational materials to build upon this basis, as explained in *Section 2.4.2*. We addressed this objective by asking the mentors what they had taught and the young people what they know in order to pinpoint the previous knowledge of the youth.

Furthermore, effective educational practice (see Section 2.4.2) encouraged us to discover the young people's specific interests to ensure that the information provided through the Edu-Eco Link program addressed those topics. The students were asked about each of the four topics of sustainability as defined in the Eco-Warriors Program description in Section 2.4.1.1: waste, water, biodiversity, and energy, (Wood, 2007).

3.3.1 Determining Youth Interests

We conducted discussion groups addressing the questions in Figure 3.2 to determine the young people's previous knowledge and interests. Questions one and two were asked to determine previous knowledge. These questions were designed to allow the participants to describe what they associate with the terms 'environment,' 'sustainability,' and 'climate change' based upon what they know. Question three was asked to determine interest in the four main environmental topics outlined by the Eco-Warriors Project description. The young people were asked to choose which of the four topics was most interesting to them; these were ranked by collecting the young people's votes of what topic they found most interesting, which were then

organized to provide a group consensus. Question four delved more deeply into the reason that each topic interested the students.

Figure 3.2 Discussion Group Questions on Interests and Previous Knowledge

Community Environmental Empowerment
Discussion Group Questions

What knowledge do you already have about the environment?

1. What do you know about the environment?
2. How would you describe:
    a. Climate Change/Global Warming
        i. What do you think causes climate change?
    b. Sustainability

What environmental topics would you like to learn more about?

3. Which of the following is the most interesting to you?
    a. Waste: non-renewable sources, landfills
    b. Energy: heat, electricity, transportation
    c. Water: lakes, streams, ocean, rainfall, human usage
    d. Biodiversity: all living things on the earth (plants and animals)
4. Why did you choose Water/Waste/Energy/Biodiversity?

3.3.2 Uncovering Perspectives of Mentors

In addition to the information collected from the young people, we asked mentors the questions in Figure 3.3 to determine what information had been previously taught and their opinions on the young people's interests. Question one determined whether the interviewees had taught anything about the environment, including a prompting question about what specific subjects they had covered. Question two inquired about the mentors' perspectives on the topics of sustainability the young people know and are interested in learning more about.

Figure 3.3 Mentor Interview Questions on Interests and Previous Knowledge

Community Environmental Empowerment
Mentor Interviews

- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
  2. Based on your knowledge of the students, what areas do you think they-
     - Know a lot about?
     - Would like to know more about?

Collecting this information from both young people and mentors provided us with a solid basis of knowledge. We gained further insight to develop educational materials by finding the pro-environmental behaviours and motivations of the Broadmeadows community.

3.4 Inspiring Actions: Motivation for Change

In order to suggest ways to improve environmental awareness, we needed to understand the youths' involvement in pro-environmental activities. To accomplish this, we used information from our discussion groups to attain the practiced behaviours and potential motives behind participation. We have defined 'participation in pro-environmental activities' as consciously seeking to minimize the negative impacts of one's actions on the world. We wanted to determine the behaviours the young people currently take part in to further their involvement in the simple, low-cost actions as described in *Section 2.2.1*.

3.4.1 Actions of the Young People

The Broadmeadows' youth participated in discussion groups that analysed their involvement in pro-environmental activities, as found in Figure 3.4. In question five, we asked

what particular contributions the young people make in each of the four main topics of sustainability. Question six was designed to determine the motivation for making sustainable decisions. With these two questions, we achieved an understanding of the sustainable actions in which the youth participate as well as their reasons for doing so.

Figure 3.4 Discussion Group Questions on Actions and Motivations

Community Environmental Empowerment

Discussion Group Questions

Why or why not do you participate in environmentally friendly activities?

5. What do you currently do to help the environment?
    a. WATER: How do you conserve water?
    b. ENERGY: How do you conserve energy?
    c. WASTE: How do you reduce waste?
    d. BIODIVERSITY: How to you preserve nature (land and animals)?
6. Why do you do those things to conserve water/energy, reduce waste, and preserve nature?

3.4.2 Mentors' Observations

Interviews gathered ideas from mentors about the behaviours of the young people. The semi-structured interview guide questions relevant to motivation and behaviour are detailed in Figure 3.5. Question five determined whether previous education affected the behaviours of the youth. The main focus, determined from question six, was to gain the mentors' perspectives on whether or not they see young people actively contributing to sustainability. This section of questions gave our team insight on the student's involvement in sustainable activities from the mentors' point of view.

Figure 3.5 Interview Questions on Actions and Motivations

Community Environmental Empowerment
Mentor Interviews

- **What opportunities are available to exercise pro-environmental behaviour?**
  5. If you have taught about the environment, have you noticed changes in behaviour after teaching these programs?
  6. What environmentally friendly actions do you observe the students taking part in?

The findings from both young people and mentors identified the pro-environmental practices that are being commonly used as well as the possible motives behind them. Adding this information to the basis of interests and previous knowledge allowed us to further design our educational approaches.

3.5 Developing Educational Approaches: Resources for Empowerment

In order to determine approaches suitable for engaging the young people in sustainable activities, we asked both the young people and the mentors what approaches are most effective in engaging the youth in any topic. The interests and motivations gathered from the previous two research objectives provided useful information about the young people, and in order to fully address them we inquired about the preferred formats for potential lesson plans.

3.5.1 Youth Opinions

To best formulate lesson plans, we including questions in our discussion groups with the young people to determine what particular educational approaches they enjoy. Question seven, found in Figure 3.6, asks the youth to describe their favourite educational experiences so that we could propose approaches they would enjoy for the Edu-Eco Link program. We polled the

students to find if the majority preferred to work in groups or alone as well as how much assistance they like to be given in order to understand their ideal learning environment. To include the students in the process of creating the materials for the Edu-Eco Link program, in question eight we asked their ideas for approaches as well as their input on our suggestions. This group of questioning enlightened us about the favoured educational methods of the young people.

Figure 3.6 Discussion Group Questions on Educational Approaches

Community Environmental Empowerment
Discussion Group Questions

What type of learning is preferred?

7. What was your favourite learning experience from school? *It doesn't have to be about the environment, but explain a specific experience and what you did.*
    a. Do you prefer to work in a group or by yourself? Why?
    b. How much help do you like your teachers to provide? Why?
8. What are some examples of activities that you would be interested in doing to help the environment? *Our ideas include: Excursions, Design Project, Experiments, Discussion, Merit System*

3.5.2 Mentors' Suggestions

In contrast with the young people, educators and mentors were able to offer our team a more professional opinion about effective approaches to engage young people on a topic in which they may not be initially interested. We used interviews to obtain this information by presenting question three in Figure 3.7 concerning what methods of teaching they have found to be successful and engaging. Question four provided information regarding the amount of guidance that is traditionally required with the young people when given open-ended assignments. These responses can be compared to the responses of the students from question

seven-b from the discussion groups. Discovering the young people's independence in this sense also provided us with information regarding their current empowerment. The mentors provided us with additional insight which we utilized in our lesson plans.

Figure 3.7 Interview Questions on Educational Approaches

Community Environmental Empowerment

Mentor Interviews

- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
  4. For projects, how often do the students need guidance and help?

3.5.3 Recorded Observations

We recorded observations of our interactions with the young people at the Centre during certain activities. We compiled our individual observations in a qualitative journal, allowing us to use what we personally noticed about the young people's interests to create appropriate lesson plans. Our group logged experiences during our first two weeks at the Centre's holiday program and recorded their actions, discussions, and attitudes.

Using the accumulation of information gathered from discussion groups, mentor interviews, and journal, we were able to answer our three research questions, allowing us to formulate lesson plans for the Banksia Gardens Community Centre that empower its young people with information about the environment.

3.5 Conclusions

These methods enabled us to answer our research questions: the young people's current level of knowledge and interest in environmental topics, a basic understanding of the pro-environmental behaviours they exhibit and their motivations for them, and their preferred

educational methods. Each of these three areas build upon one another in a hierarchy that illustrates the stability of our research methods, which is illustrated in Figure 3.8.

Figure 3.8 Hierarchy of Information

We began by discovering the young people's prior knowledge, which provided a foundation for our programs. This first level of the hierarchy also enabled us to evaluate the youths' interests in the environment, allowing our conclusions to reflect their concerns and desires. We then uncovered what environmentally friendly practices they participate in and what motivates them to do so. Knowing the current pro-environmental behaviours allowed us to design programs that avoided redundancy and focused on areas of interest not currently exhibited in the young people's behaviour. The information on preferred educational approaches built

upon all of the previous research and provided further justification for the Edu-Eco Link program. Overall, the collection this information allowed us to determine the best educational resources for the Banksia Gardens Community Centre to educate and empower the young people and their community.

4. Findings and Analysis

From January 28, 2010 to February 19, 2010, our team conducted nine interviews with mentors, led four discussion groups with approximately seventy-one students, and recorded three entries in a qualitative journal. These methods enabled us to ascertain the environmental interests, prior knowledge, motivations, behaviours, and preferred learning approaches of the young people in the Broadmeadows area. The summarized responses from each interview and discussion group appear in Appendices B and C, respectively, and the journal entries are in Appendix D. Our results are summarized with respect to each of our research objectives in the following sections.

To analyse the responses generated by these methods, our team performed a content analysis (Kalof & Dan, 2008). We created themes which were discussed by the mentors and young people and then coded the data to count the number of times each theme was mentioned. A theme was defined as 'mentioned' if one or more students described the topic in discussion groups, or if the mentor acknowledged the theme at any point in the interview. The frequencies were compiled into the graphs in the following sections and the themes will be explained with respect to each research question.

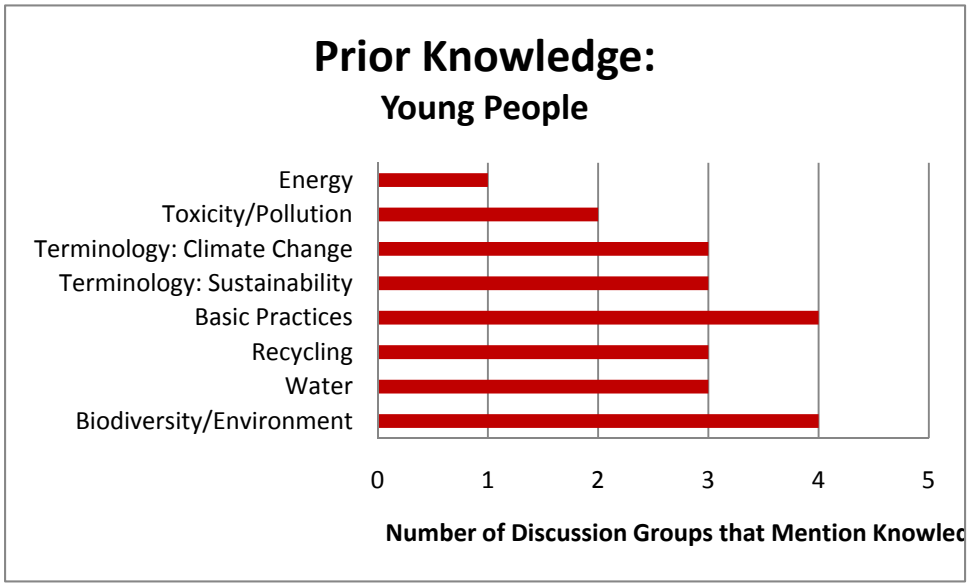
4.1 Building a Basis: Findings on Interests and Prior Knowledge

In this section, we discuss the findings that were collected to determine the youth's interests and prior knowledge. We gathered responses from both the young people and mentors to determine that, while there was no clear consensus for a preferred topic of sustainability among the young people, they displayed a basic understanding of the terms of climate change and general sustainable practices.

4.1.1 Youth Findings on Interests and Prior Knowledge

The discussion groups with the young people revealed that the students have a basic knowledge of the general practices that can be used to mitigate climate change. As seen in Figure 4.1, all of the discussion groups mentioned basic sustainable practices. Each group was able to define ten or more activities which they used or were aware of. When asked about the environment, three of the four discussion groups had responses about water and recycling, and all four were aware of biodiversity. Also, at least one person in three of the discussion groups could define the terms 'sustainability' and 'climate change', again showing that the young people have general knowledge in the area.

Figure 4.1 Prior Knowledge of the Young People from Discussion Groups



Addressing primary school youth, we observed 'Movie Night' at Banksia's Youth Development Holiday Program and also conducted a discussion group with a year five and six class at Broadmeadows Valley Primary School. The young people at 'Movie Night' participated in an interactive game which displayed a household room with unsustainable practices. The

youth identified all four of the environmental improvements which could be made in the room. They recognized the recycling in the rubbish bin, the air conditioner being used rather than the fan, the faucet leaking, and the lack of plants in the backyard. The young people continued to give suggestions of sustainable behaviours even after the game was over. In addition, nearly all of the students in the third discussion group raised their hand when asked if they were familiar with the terms 'climate change' and 'global warming'. Less students raised their hands when asked if they understood the term 'sustainability,' but all of the primary school students we interacted with were able to provide us with many examples of sustainable activities. These examples showed that the young people of this age group have a general understanding of climate change but cannot make the link between the terminology and sustainable actions.

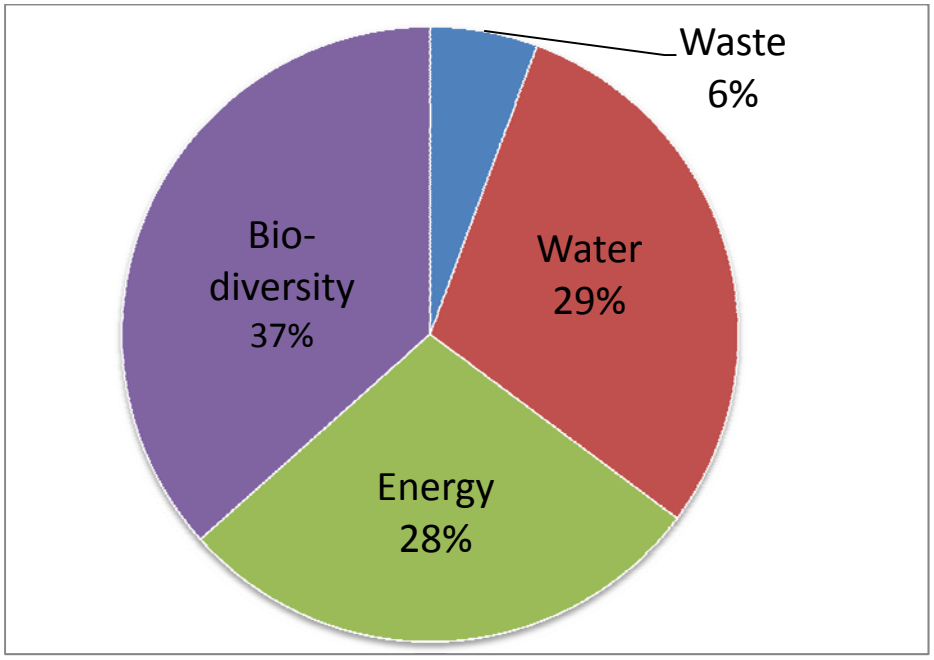
Among secondary school students, we conducted two discussion groups at the Kangan Batman TAFE and one discussion group at the Banksia Gardens Community Centre. We found that, similar to the younger cohort, these young people have a general understanding of the effects of climate change. Multiple students in two of the three discussion groups held with older students were able to adequately define 'climate change' and 'sustainability.' Discussion groups one and two used key terms about the environment as well, mentioning 'global warming,' 'greenhouse gases,' 'carbon emissions,' and 'ozone layer' when asked generally about the environment, reinforcing that they have an understanding of the concept.

In addition to establishing prior knowledge, we also wanted to determine if there was a preferred topic of sustainability among the youth. When asked to choose which topic was most interesting to them, the students in each discussion group rated the four topics in a different order; in discussion group one, water was ranked highest, whereas in discussion group two, water was ranked third. When we asked about their interest in water, discussion group one

remarked their concern was due to “it being part of their lifestyle,” as well as “important to the biodiversity of Australia in their prevention against drought.” Biodiversity received a slight majority of votes in three of the four groups, but other topics were almost equally as popular.

The responses from the discussion groups are summarized in Figure 4.2. The interests of the young people were evenly distributed between water, biodiversity and energy, with waste being the least popular at 6% of votes. We found their interest in sustainable topics was very diverse, and there was no option which was highly favoured among the four.

Figure 4.2 Distribution of Student Interest in the Four Topics of Sustainability

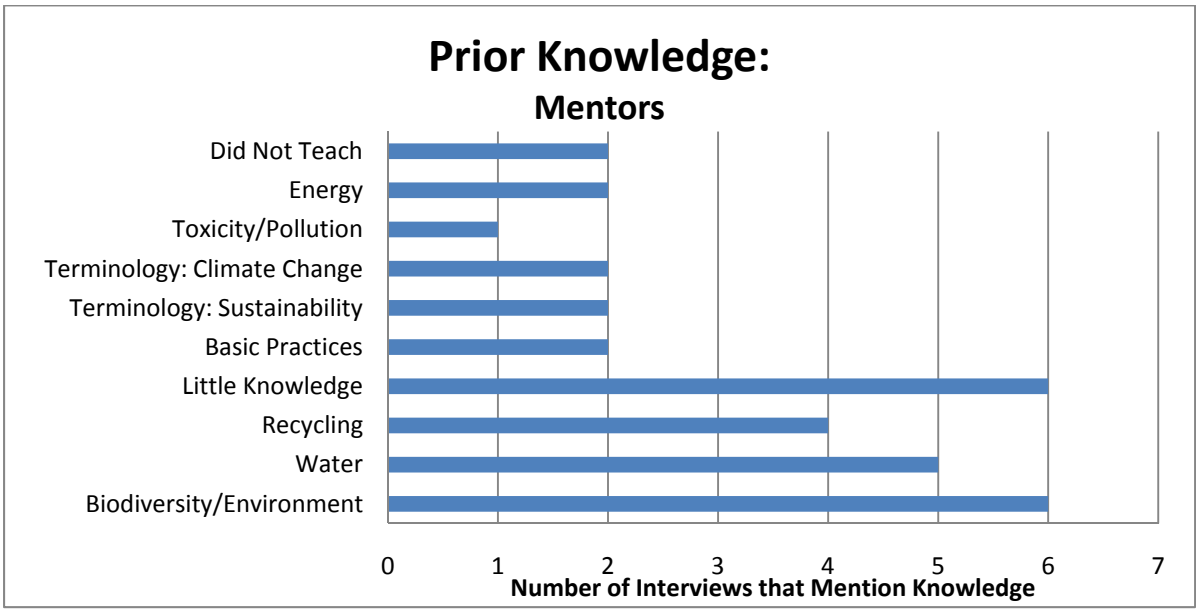


4.1.2 Mentors’ Findings on Interests and Prior Knowledge

Figure 4.3 summarizes the mentors’ opinions of the young people’s current knowledge of environmental topics. These responses were compiled from our interviews with nine mentors. The mentors felt that young people are not very knowledgeable about climate change and sustainable practices; in fact, two thirds of the mentors stated that the students have little relevant

knowledge. Over 40% of the mentors stated that the knowledge the young people do have concerns water, recycling and biodiversity or the environment.

Figure 4.3 Mentors' Opinions of Youth Prior Knowledge

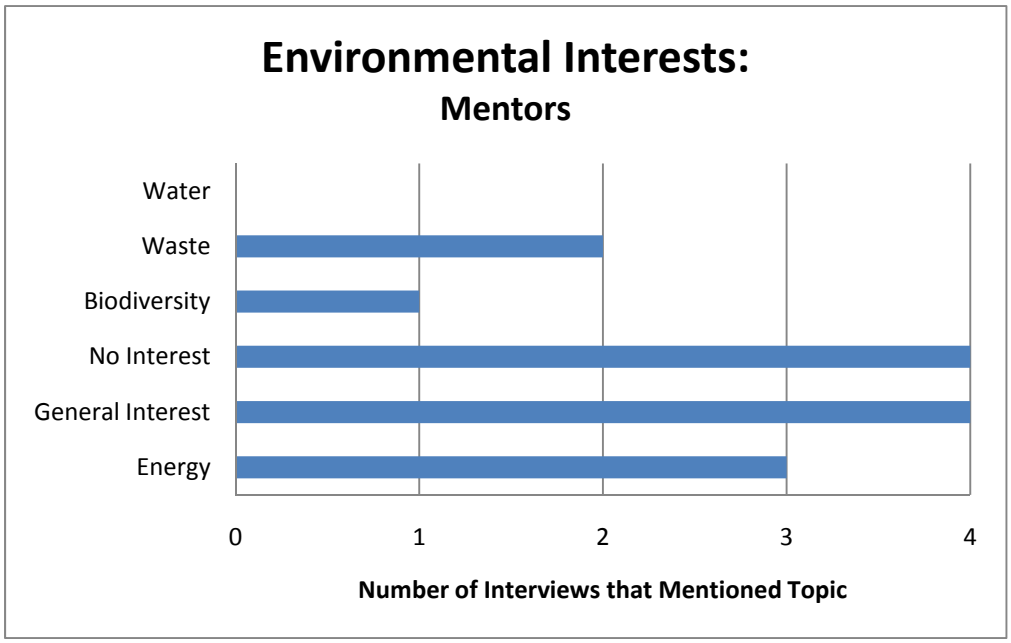


During the interviews, the mentors specified environmental areas that the young people are aware of and those with which they were less familiar. Three mentors agreed that water was the topic the young people would have the most current knowledge about because of its prominence in modern Australian society. The same interviewees believed the young people were particularly uninformed about energy, and encouraged education in this area. Three mentors informed our team that the young people recycle at home, and interview eight added that the youth "ask for a recycling bin" when cleaning up. Six of the nine mentors have educated the students about biodiversity and the environment. One mentor described that they were currently teaching a five week unit to the students about the "physical features of Australia, local environment including introduced animal species, and natural disasters such as drought, bushfires and flooding."

Two interviewees said that, though the young people understand the general terminology of climate change, they cannot make the link between these ideas and the reasons they occur. One example, presented in interview eight, described how students were confused with the idea that black cars are worse for the environment because their colour causes the car to get hotter and, therefore, requires more air conditioning to regulate temperature.

The mentors' perspectives on the students' areas of interest varied, reinforcing the findings in Figure 4.1: there is no single area of interest where our programs should focus. Figure 4.4 illustrates the range of perceptions among the interviewees of the environmental interest of the young people. To further support this notion, interviewee three explained that, in her opinion, the young people could be interested in anything. Interest may be dependent on the young people's attitudes and social acceptance. For example, interviewee six suggested that it might not be "cool" to participate and express interest in environmental issues.

Figure 4.4 Mentors Views on Youth Environmental Interests



4.1.3 Analysis: Interests and Prior Knowledge

Overall, we found that there is no single favoured environmental topic among the young people and their prior knowledge is basic. This is supported by the mentors' conclusions that the young people have general interest in climate change. From these findings, the best course of action is to focus the educational material for the Edu-Eco Link program on all of the topics of sustainability. Our research also suggests that the young people have a basic understanding of the concepts of climate change. The participants in the discussion groups displayed general knowledge, consistent with the mentors' perceptions. However, our team believes the young people could benefit from information beginning with the essentials to reinforce the link between environmental knowledge and actions.

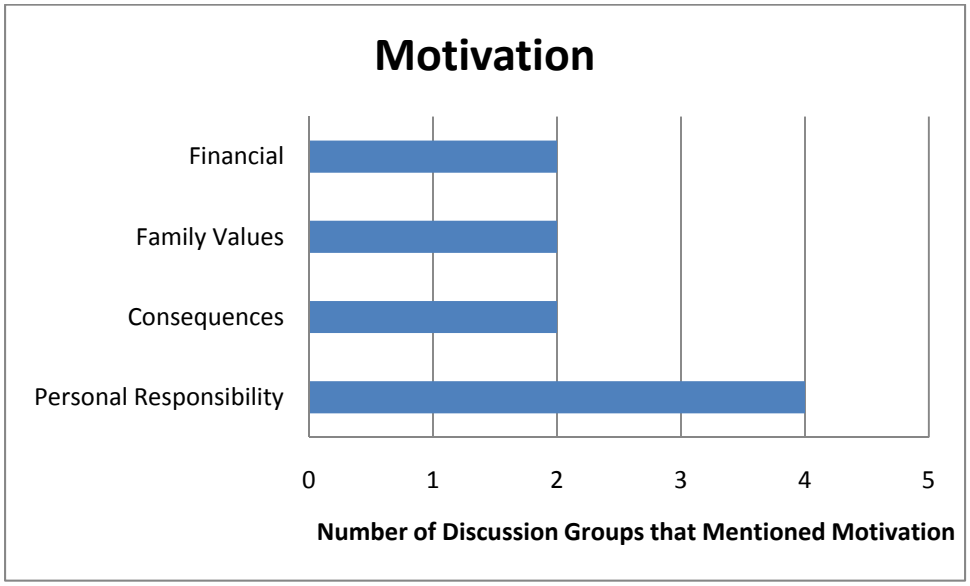
4.2 Inspiring Actions: Findings on Motivation and Current Behaviours

In this section, we discuss the findings that determine the youth's motivation and participation in sustainable activities. Our discussion groups did not reveal a common motivation for young people to be involved in sustainable actions, but rather provided a list of possibilities. Although the young people could describe many pro-environmental activities, the mentors believed otherwise.

4.2.1 Youth Findings on Motivation and Current Behaviours

To determine motivation and participation in environmental behaviours, we utilized findings from discussion groups and events at Banksia's Youth Development Holiday Program. The motivations that were mentioned in the discussion groups are shown in Figure 4.5.

Figure 4.5 Youth Environmental Motivations



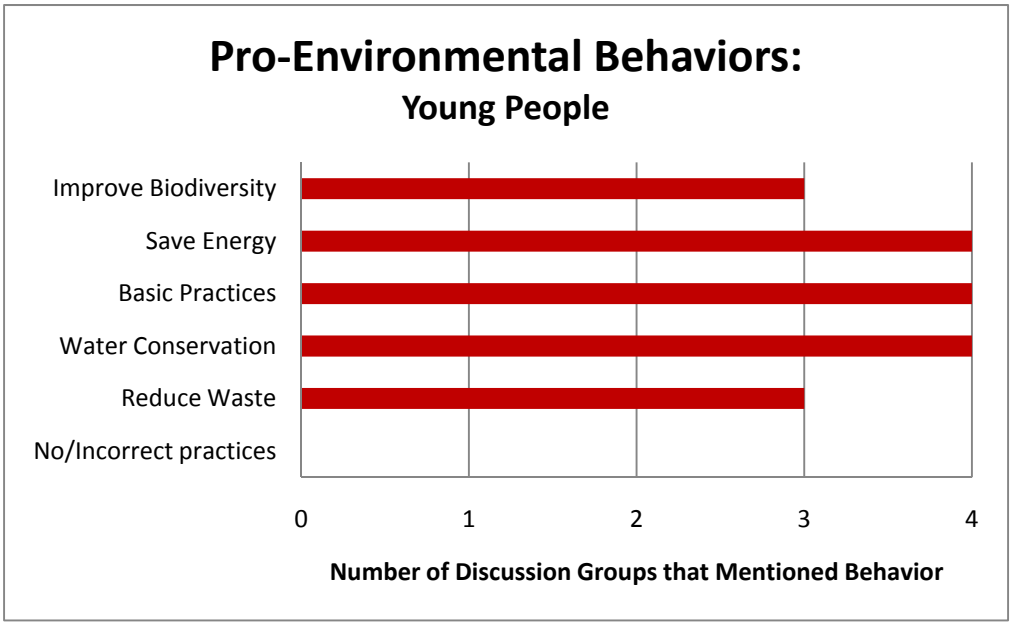
Financial motivation, family values, and avoiding negative consequences were mentioned in half of the discussion groups as motivations for participating in sustainable behaviours. Many participants said that they conserve resources in order to save money. Students also mentioned that their family values on the environment encouraged them to act the way they did. Some students were concerned about the negative consequences that climate change may bring. One student stated that he acts to benefit Australia in order to avoid severe droughts.

The majority of the young people stated that their motivation was personal responsibility. Students said that they try to "do their part" in order to "make sure there is enough [resources] for everyone." This motivation was mentioned in all four of the discussion groups. The younger students stated that their motivations concerned saving the planet and helping animals. One student specifically mentioned that their "whole family loves animals, so [they] try to save them," which shows that students can have multiple motivations for acting sustainably. Since there was no agreement on one prominent motivation we concluded that financial

responsibilities, family values, avoiding negative consequences and personal responsibility are important motivators for the students to act sustainably.

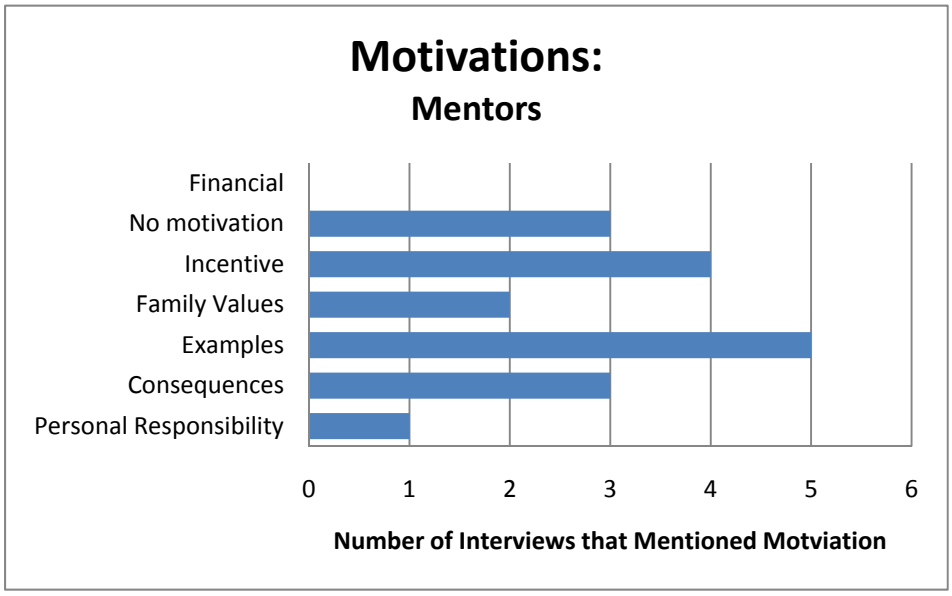
We also learned which sustainable activities young people take part in. Using information from our discussion groups, we found that the young people exhibit easy, cheap, and convenient sustainable behaviours. Figure 4.6 reveals that participants in the majority of the discussion groups described sustainable behaviours about each of the four environmental topics. To conserve water, young people mentioned they take shorter showers, use grey water tanks, and collect and reuse excess water to use in their gardens. Turning off light switches and appliances was also suggested in all four of the discussion groups as methods of conserving energy. Two discussion groups mentioned recycling and three mentioned cleaning up rubbish as ways to reduce waste. In one instance, a student recalled that he and his family picked up rubbish during a hiking trip. Three of the discussion groups mentioned plants and biodiversity as well, suggesting maintaining household gardens.

Figure 4.6 Pro-Environmental Behaviours of the Youth



4.2.2 Mentors' Findings on Motivation and Current Behaviours

Figure 4.7 Mentors' Opinions on Youth Motivations

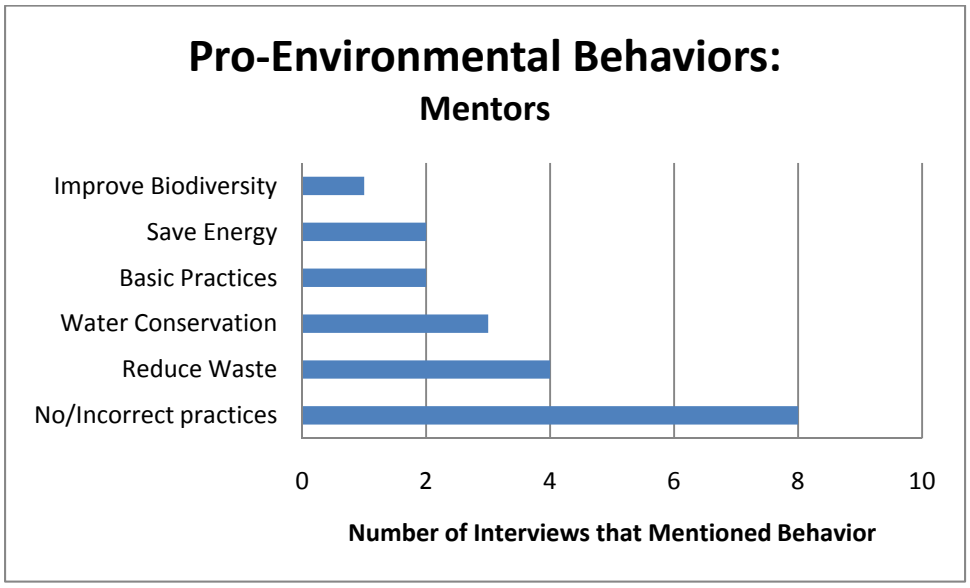


Though Figure 4.7 shows there was no clear consensus from the mentors about the youth's behaviours, we were still able to collect useful information about the motivations of the young people from their responses. Three of the interviewees explained that most of the young people have no motivation to participate in environmentally friendly activities and are typically more interested in their own personal desires, such as "sex, alcohol, and drugs." Personal responsibility and negative consequences were addressed in interview three. This interviewee scolded a young person about littering around the Centre, explaining "it's your Centre," and it deserves respect. Later, she witnessed the boy having the same conversation with his younger brother. The only motivation that more than half of the mentors described was following an example. The examples set by teachers and parents were suggested as being the biggest inspirations to youths. Similarly, two mentors stated that they try to motivate the young people by being good role models. Another motivation suggested by interviewees included using

incentives to encourage behaviour. Overall, the mentors did not provide any specific motivations for the young people's sustainable actions.

Figure 4.8 shows that two of the interviewees agreed that the young people are aware of basic sustainable practices. The specific pro-environmental actions the young people partake in were also mentioned in the interviews, however, the mentors did not notice the youth taking part in them regularly or correctly. Two interviews stated that the young people were unable to recycle appropriately in the presence of the mentors. In fact, over 90% of the mentors suggested that they do not experience the young people taking part in pro-environmental practices or completing them correctly.

Figure 4.8 Mentors' View on Youth Pro-Environmental Behaviours



4.2.3 Analysis: Motivation and Current Behaviours

Our findings created a list of possible motivations for participation in pro-environmental activities. As described by the mentors and students, the youth may be motivated by financial convenience, personal responsibility, family values, avoiding negative consequences, receiving incentives, or following examples. Though the young people in Broadmeadows have an

understanding of sustainable practices, the mentors rarely witness them participating in these actions. Also, the majority if practices that the young people mentioned were simple, low-cost, and convenient.

4.3 Developing Approaches: Findings on Preferred Educational Methods

Using the discussion groups, interviews and observational journals, we compiled the preferred educational methods of the Broadmeadows youth. All of the results suggested interactive and hands-on approaches. The discussion groups allowed us to determine the preferred learning methods of the students, while the interviews informed us on the mentors' recommendations for successful approaches. The observational journal provided additional reinforcement for what we observed during the Centre's Youth Development Holiday Program.

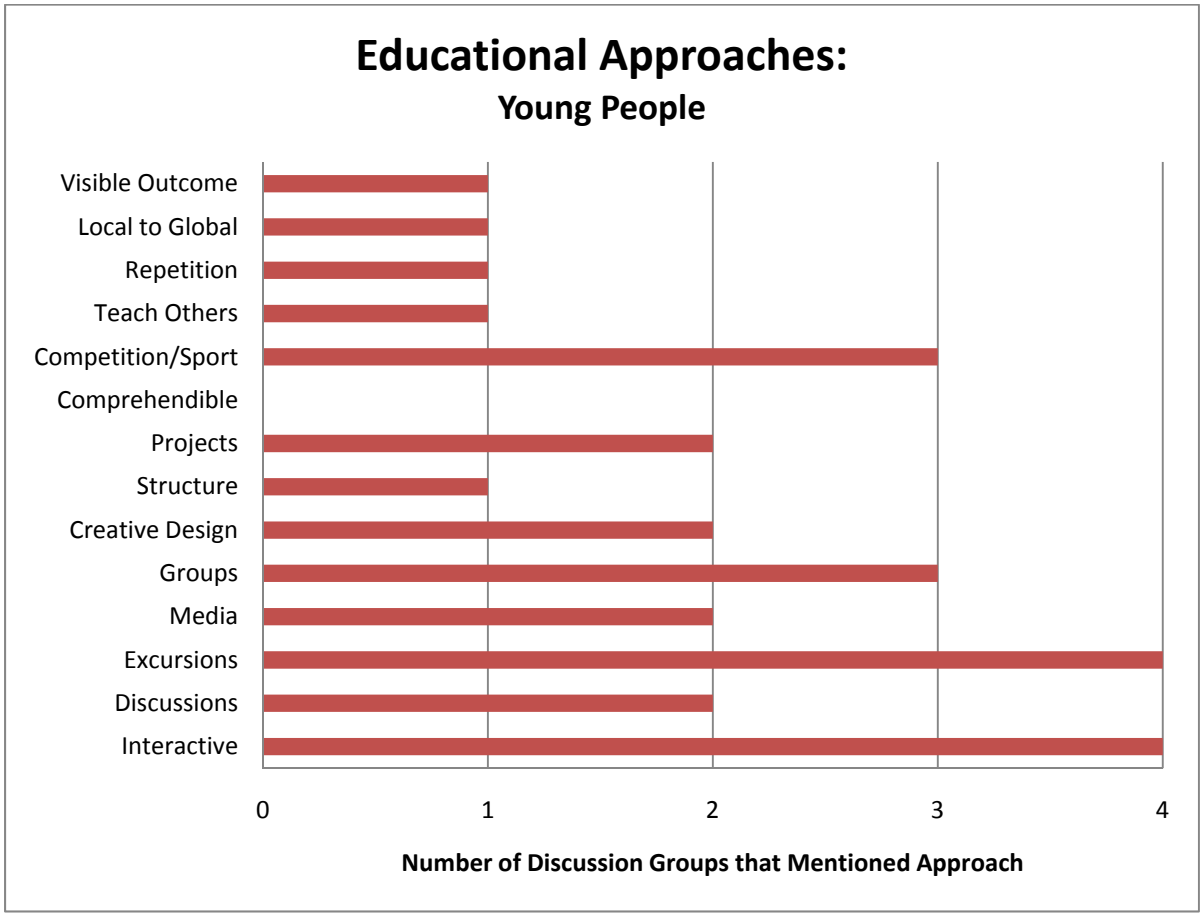
4.3.1 Youth Findings on Preferred Educational Methods

From the discussion groups, we learned that youth preferred educational methods that involve less lecturing and more interactive activities and excursions. These approaches were mentioned in all four of the discussion groups, as seen Figure 4.9. Group work and events involving competition were favoured by three of the four discussion groups. In addition, the observational journal recommends heavily guided activities or media, such as photography, video production, and computer activities.

The young people involved in the discussion groups suggested interactive activities to reinforce a learned lesson. They expressed enjoying to "learn, then do" to fully comprehend a topic, meaning that after teachers explain a concept, they enjoy further exploring it interactively. The youth recommended that there be as little lecturing as possible and preferred approaches built on participation and interaction.

Excursions were mentioned often during the discussion groups as approaches the young people enjoyed. For example, students suggested trips to Scienceworks as well as local nature walks. The young people were enthusiastic about full-day activities, and recommended an excursion to a landfill to see where rubbish goes.

Figure 4.9 Favoured Educational Approaches of the Youth



When asked about how they preferred doing project-based work, the youth said they enjoyed a mix of individual and group work. One student suggested discussing the problem in a group and then working individually on solving the problem. This permits each student to discuss their ideas in a group setting while still taking personal responsibility and incorporating their own creativity in the result.

From our qualitative journal, we observed that students can be highly motivated in any activity if there is competition involved. Sports and physical education were the favourite activities of many of the students in three of the discussion groups. At both the Junior Olympics and Rugby Camp, we observed that on an individual and group scale, competition was a great motivator for action and teamwork.

Our observations of the Youth Camp also showed that the young people had interests in interactive and visual media, especially those accessible online. During free time at the Centre, the computer room was always full and young people would wait in line to use the computers. When students were unable to use computers, arts and crafts were popular activities, which demonstrated that the youth students enjoy using their creativity to express themselves.

Although only one discussion group talked about the structure of educational approaches, we recorded in our observational journal that young people were most respectful in more organized settings, such as classrooms. During the Centre's Rugby Camp and Junior Olympics, for example, the young people were rambunctious and did not appear to respect the mentors facilitating the activities unless there was a clear set of instructions to be followed. During the Movie Night, a more controlled setting, the young people were calm and behaved respectfully while we presented a slide show and an interactive game to them.

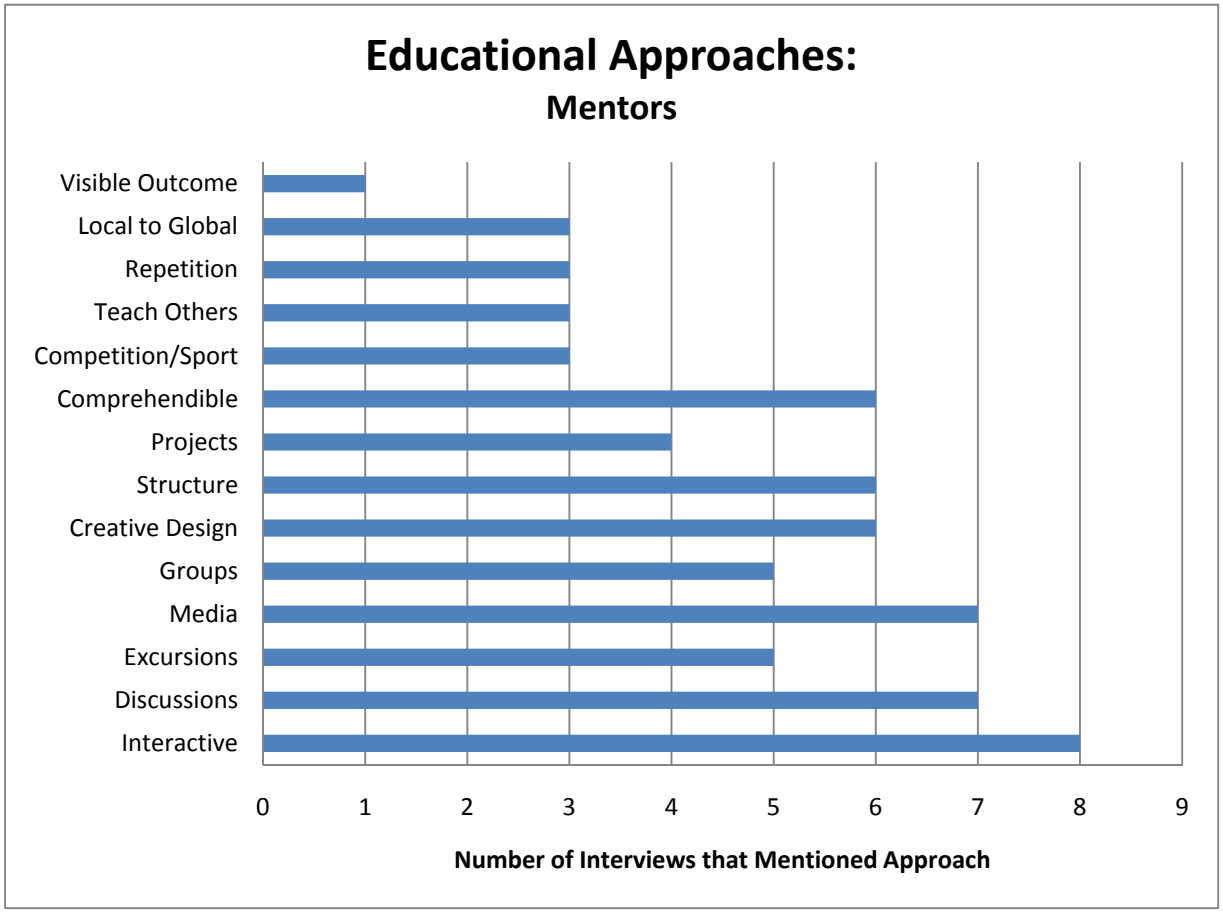
The young people, through our discussion groups and qualitative journal, displayed that interactive activities, excursions, group work, competitions, interactive and visual media, and structured activities are all educational approaches they prefer.

4.3.2 Mentors' Findings on Preferred Educational Methods

The nine mentors we interviewed suggested many appropriate activities their students enjoyed. There were eight approaches more than half of the interviewees recommended.

Interactive learning, excursions, group work, structured programs and the use of media were among the most common responses. In addition, the mentors mentioned creative design projects, presenting information in an understandable format, and group discussions.

Figure 4.10 Mentors' Preferred Educational Approaches



Over 90% of the mentors agreed that interactive learning was a successful teaching approach for young people. One mentor said young people "like doing things with their hands," and therefore would enjoy interactive activities. In one example of an interactive program, the participants learned to administer medication to young children by practicing their skills on stuffed animals.

Excursions were also a popular recommendation, and were suggested by six of the nine interviewees. In order to stress the importance of using recycling materials, one mentor described an instance of finding and creating sustainable toys which were brought on a trip to the beach. Another interviewee recommended that the students would enjoy attending events, such as a sustainability festival. One example of a successful program was an instance when young people walked along a creek to learn about local biodiversity.

The mentors also recommended that the students work in groups. When one mentor divided her students into smaller groups, it worked well and the young people were able to discuss and learn the material through interactions with one another. In another example, the students were separated into groups to address a variety of hypothetical scenarios because it allowed them to learn from and teach each other. One interviewee described a group competition that avoided the shame a student may feel from responding incorrectly by allowing the group to provide a single answer after collaborating to create a response.

The interviews encouraged a combination of guidance and independence throughout educational approaches as well as presenting material in an understandable format. One mentor preferred semi-structured lesson plans because the students "like structure, but also want to be able to move freely within group sessions." Another interviewee explained the need for comprehendible material when stating that she tried to "make [her lessons] as clear and specific and simple as possible, but it's never simple enough" for the young people. The mentors also suggested simple language, but warned not to be so simplistic that it offends the young people.

Media and creativity are also effective educational approaches. Two interviewees mentioned the use of interactive media and explained that young people enjoyed watching videos as an educational tool. Another mentor agreed that "videos and photos as visual aids help [the

youth] with learning concepts." Media and creative design can also be combined for educational approaches. Four out of the nine interviewees preferred the use of design projects, including movie production, to help the young people understand the material and see a tangible accomplishment.

Interviewees encouraged competitive activities to unite individuals to work together as a team to solve common problems. For example, one mentor used competing groups during oral quizzes to promote teamwork between the students as well as to help each other answer the questions.

Group discussions were recommended by five of the nine mentors. Two interviewees suggested including hypothetical scenarios in discussions because they encourage conversation and allow the young people to visualize what is being discussed. The mentors advised that group discussions can be utilized as an opportunity to reflect and self evaluate as a way of encouraging lifelong learning.

Another principle our interviews stressed was beginning with local information before branching out to global topics. Interviewees suggested that this approach would allow the young people to better understand the link between tangible local effects and widespread global effects. An interviewee specifically mentioned to "first introduce things [the young people] can personally relate to, and then step back into something more broad." Her reasoning behind this statement is that "[disadvantaged] people debating melting ice caps is not realistic because it doesn't relate to them personally." Furthermore, interviewee three said beginning with "talk[ing] about local issues in [Broadmeadows]" can help stimulate initial interest in a program.

4.3.3 Analysis: Preferred Educational Methods

Our findings encourage programs that are fun, engaging, creative, and interactive. Information must start locally and then branch out to more global topics, and learning material should be followed by hands-on action. Six categories of activities were formulated form the youth and mentor suggestions: excursions, discussion groups, experiments, competitions, design projects and interactive media.

4.4 Edu-Eco Link Program Design Principles

From the results gathered from our interviews, journals, and discussion groups, we derived design principles for the Edu-Eco Link program. These design principles are tailored to fit the criteria presented by the young people of Broadmeadows as determined by our findings and previous research. We have categorized these principles into those which deal with the content of the program, and those which describe the actual methods to be used.

The Broadmeadows youth will benefit most from environmental education concerning energy, waste, water and biodiversity. The concept of covering multiple environmental topics parallels the Banksia Eco-Warriors program design (see *Section 2.4.1.1*). As shown in *Section 4.1.2*, the youth did not specify a preferred topic, suggesting that all four environmental subjects should be included to ensure that the program addresses their diverse interests.

We addressed all possible motivations in our program to increase the likeliness that participants will exhibit environmentally friendly behaviours according to the Fogg behavioural model (Fogg, 2009). Since there was no universal motivation, we also addressed social acceptance to obtain the best results (Syme, Nancarrow, & Seligman, 2000).

In addition, *Section 4.1.2* explains that the young people only have basic knowledge of climate change and sustainability and are unaware of the link between terminology and

behaviour. Therefore, the material covered by the Edu-Eco Link program should present information on climate change which begins fundamentally before exploring more complex topics as well as explain how the young people's actions can mitigate the harmful effects. Mentors in *Section 4.3.2* encourage that the information presented by the program will be better understood if it begins with relevant local issues and expands to global concerns. The findings from the mentors in *Section 4.3.2* propose that the presentation and language of the material is essential in order for the young people to comprehend the information. The importance of proper communication is also discussed in *Section 2.3,* which explains that knowledge cannot be empowering if it is not presented appropriately.

The Edu-Eco Link program suggests that the young people adopt simple and low-cost behaviours. The majority of behaviours which young people currently participate in, as described in *Section 4.2.1,* require little or no monetary contribution. Also, as explained in *Section 2.2.1*, disadvantaged areas, similar to Broadmeadows, find themselves unable to partake in expensive mitigation techniques. Therefore, adopting the low-cost solutions presented in the Edu-Eco Link program can be beneficial for their budgets as well as the environment.

To effectively present the material on climate change, our research has shown that the teaching methods for the Edu-Eco Link program should follow certain guidelines. Both mentor interviews and discussion groups favoured a balance between heavily structured and openly independent activities. Also, the discussion groups in *Section 4.3.1* presented no clear preference between working individually or in a group. In fact, many students stated they enjoyed both. Therefore, we decided that the program should combine both group activities as well as individual work.

Within the program, information must be presented and reinforced through interactive learning experiences. Engaging activities were favoured by the majority of the students in our discussion groups and recommended by nearly all of the mentors. Additionally, our research from *Section 2.4.3* found that methods of interactive learning were appropriate for science education. Community education programs seen in *Section 2.4.1* also evinced the importance of learning outside of the classroom setting.

The approaches for the Edu-Eco Link program must also vary between interactive learning styles. In *Section 2.4.3* we presented a study which argued more knowledge was gained when a variety of different programs covering the same topic were used. Also, the specific preferences for approaches in *Section 4.3.1* were varied, suggesting we utilize many diverse approaches in order to address a large range of learning styles.

Table 4.1 Program Design Principles

Content Program Design Principles	Educational Methods Program Design Principles
Focus on all environmental topics	**Balance of guided and independent activities**
Begin teaching fundamentals	
Lessons address motivation of the youth	**Include group and individual programs**
Information is effectively communicated	**Lessons should combine information and interactive learning for each concept**
Information is related to them on a local level before expanding to global concerns	
Teach simple, low-cost pro-environmental activities	**Engaging approaches should be varied**

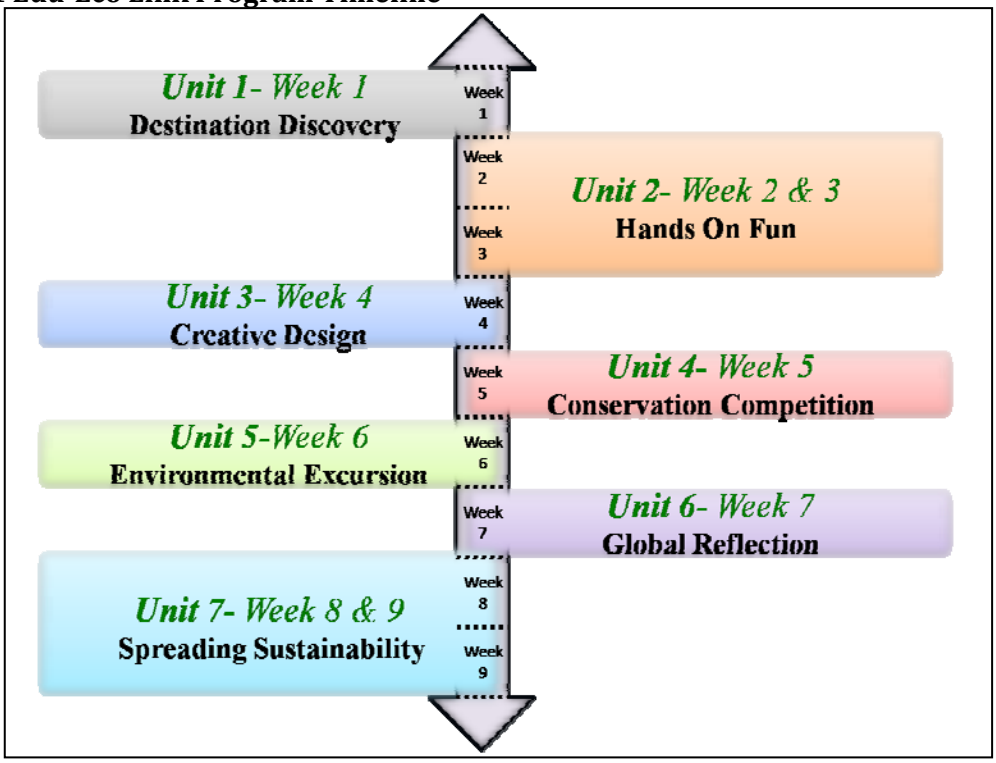
Using all of the previously described design principles for content and educational methods (summarized in Table 4.1), we created a strong framework for the Edu-Eco Link program.

5. Conclusions and Recommendations

5.1 Banksia Gardens Eco-Warriors: Edu-Eco Link Program

The Banksia Gardens Eco-Warriors program is an initiative at the Centre to encourage sustainability. Our group came to the Banksia Gardens Community Centre to develop a framework for the Edu-Eco Link program, a component of the Eco-Warriors that targets students from primary and secondary school as well as public housing tenants. Our objective was to empower the young people of Broadmeadows by creating a program that educates them to encourage more environmentally conscious decisions.

Figure 5.1 Edu-Eco Link Program Timeline



Based upon the design principles stated in *Section 4.4*, we created a nine-week, seven unit program for the Banksia Gardens Community Centre. The Edu-Eco Link program follows the timeline seen in Figure 5.1. The design principles were derived through consultation with the

community, youth, and mentors; such consultation is a key aspect of empowerment. The program we developed is based upon these principles which are easily adaptable to other programs or topics, allowing the Centre to create or modify programs without the need to conduct further research.

Table 5.1 Menu of Edu-Eco Link Program Activities

The multitude of activities shown in Table 5.1 conveys the options which can be used for each unit of the program. The nine-week program is a collection of excursions, discussions, experiments, competitions, and design projects. All activities are fun, interactive ways for the young people to learn about the broad topics of sustainability. In order to make an empowering educational experience, our program framework grounds the issues of climate change within the local community before expanding to global issues. The young people will be able to see the outcomes from the projects and activities of the program and realize that their impact was meaningful.

Through the Edu-Eco Link program, the young people in the Broadmeadows community will gain the information necessary for a greener future. Participating in the program will allow the young people of Broadmeadows to acquire knowledge of environmental issues, to experience working in a group setting, to learn general scientific procedures, and to see their actions can make a difference.

5.2 Recommendations for the Banksia Gardens Community Centre

From our interactions with the young people and mentors in Broadmeadows, we have formulated some recommendations for the Centre to improve the quality of the Edu-Eco Link program.

- **Sample Recommended Program Activities:** From the diverse menu of Edu-Eco Link program activities shown in Table 5.1, we have selected the particular sequence of activities highlighted in blue in Table 5.2 as a potential first offering of the program. This program was chosen because it provides a balance of activities surrounding each of the four main topics of the environment at moderate cost: the ‘Leaky Pipe Exercise’ covers

water, the 'Food Miles' activity is about energy, the 'Recycling Olympics' program concerns waste, and the excursion to Scienceworks teaches biodiversity, while the remaining activities encompass all four topics. The proposed selections will cost approximately $16.70 per participant (based on a total of twenty participants), which is less expensive than many other programs at the Centre. However, the facilitators of the Edu-Eco Link program have the option to choose specific activities to fit their budget, as provided in the estimated budget in Appendix F.

Table 5.2 Recommended Edu-Eco Link Program Activities

- **Characteristics of the Program Facilitator**: In our interviews, many mentors stated that the interests and attitudes of the educator often play an influential role in environmental education. Our team recommends that the facilitator selected to oversee the Edu-Eco Link program be passionate about the environment and actively participate in sustainable practices in order to better inspire the young people in the program to participate themselves.
- **Partnerships:** We recommend that the Edu-Eco Link program operate in partnership with local schools or government initiatives. Some potential partners include Broadmeadows Valley Primary School, Roxburgh College, Ilim College, Hume Central, and Hume City Council. More details and contact information for these groups are found in Appendix G. In addition to this project report and an Executive Summary, our team has provided the Banksia Gardens Community Centre with a PowerPoint presentation to use to describe the Edu-Eco Link program to potential partners.
- **Rewards:** To further encourage participation in the Edu-Eco Link program, we suggest creating a reward system in which participants receive credit for each program they attend during the nine weeks. This concept of rewards stems from the notion of possible motivational incentives as suggested by a number of our interviewees. These credits would be displayed publically within the Centre as well as tracked on an Edu-Eco Link website, which could also detail the dates, times, and places of all of the activities. Participants who attend a specified number of units could receive a certificate of achievement at the end of the program. If the program were operated in partnership with

an outside organization, those who complete the program could receive additional school credit or recognition through that partner.

- **Future WPI Projects**: There are many opportunities for future WPI project teams to contribute to the Banksia Gardens Community Centre. Our group recommends that one future team evaluates the Edu-Eco Link program we have established in order to test the effectiveness of the program. This could be accomplished by evaluating whether participation in the program changes behaviours as well as determining if the educational material is retained by the young people. It may also be useful for the project to test the effectiveness of the activities in each unit and to determine the young people's opinions of them. A separate WPI project that could be conducted in partnership with the Edu-Eco Link program could involve furthering the ideals of sustainability established in the program within the surrounding neighbourhood households. This may be accomplished by adding a unit to the program to bring the concept of sustainability into the household in order to improve participation in pro-environmental activities as a community.

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7. Appendices

Appendix A: Government Programs on Environmental Education

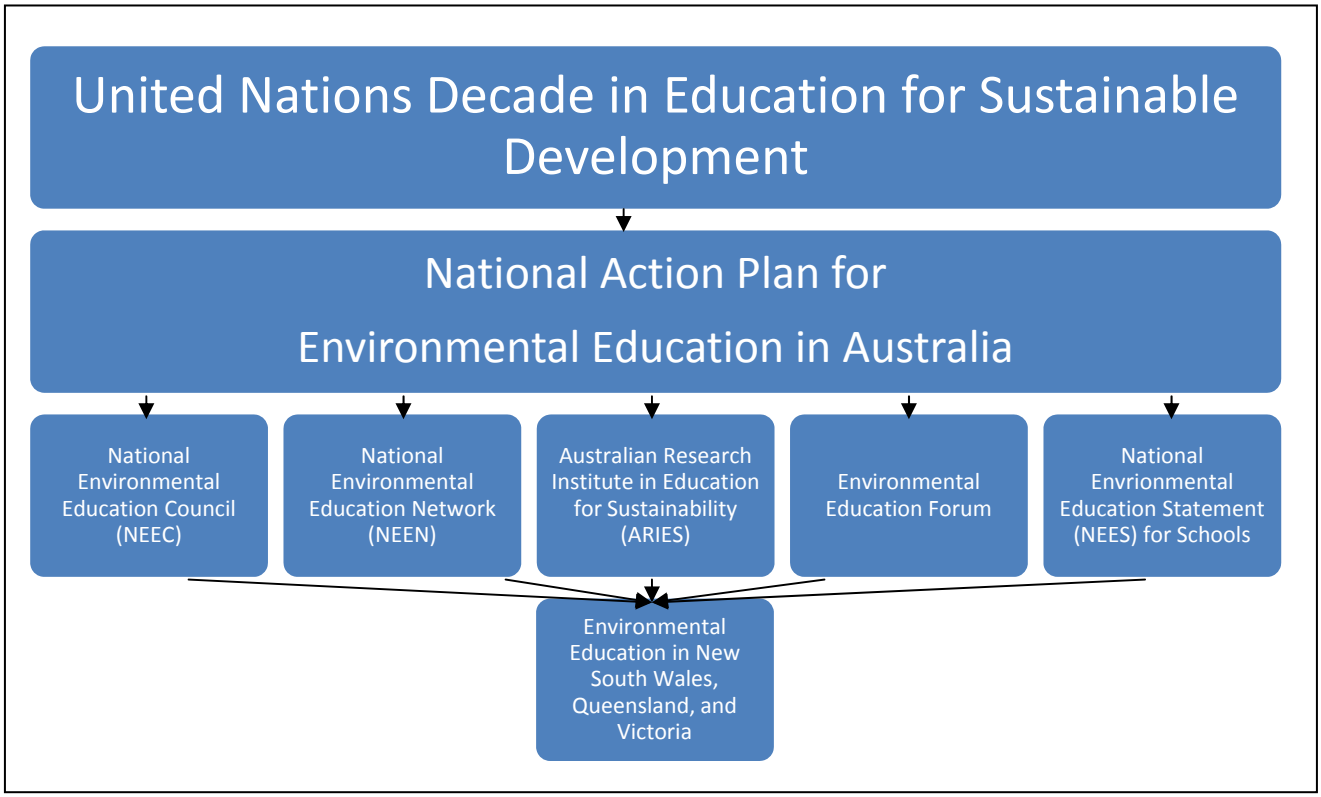
Many governments are devoting attention to formal education as a means of promoting environmental awareness. For example, the United Nations Decade in Education for Sustainable Development began in 2005 and will end in 2014. It is a worldwide effort to "…integrate values, activities and principles that are inherently linked to sustainable development into all forms of education and learning and help usher in a change in attitudes, behaviours and values to ensure a more sustainable future in social, environmental and economic terms" (United Nations Educational, Scientific, and Cultural Organization, 2007). This is being achieved by national governments primarily through community and classroom-based programs, allowing the youth to change their attitudes towards sustainability (United Nations Educational, Scientific, and Cultural Organization, 2007).

Australia participates in the UN Decade in Education for Sustainable Development through programs to address the concerns of environmental education. In July 2000, Australia launched its National Action Plan that encourages activities in environmental education for sustainability in formal education, community education, and industry. This plan includes the agencies which are outlined in Figure 2.3. This figure first illustrates global policy, which leads to Australia's National Action Plan as previously discussed, followed by Australian programs on a state-wide and then nation-wide level.

Policy within each state's formal education system varies, but leaves room for improvement nationwide. Some of the certified schooling systems of Australia have resisted the incorporation of information on sustainability while others embrace it (Tilbury, 2004). In fact, environmental education is not mandatory or regulated for all education systems (Tilbury, 2004). However, the policy is unique in each state, and there is a policy ensuring environmental education in New South Wales, Queensland and Victoria (Tilbury, 2004). Throughout these schooling systems, sustainability is mainly being taught in the Science and Studies of Society and Environment Key Learning Area, even though it can be incorporated in many more aspects (Tilbury, 2004).

The emphasis on environmental issues in Australian education evinces its importance to the nation, even with differences in implementation on local and state levels.

Figure A: Relationship of Environmental Education Policy



Appendix B: Summarized Mentor Interviews

Mentors Interview #1

1-28-10

- **Teacher profile**
  - Where do you teach?
    - *Victoria University as part of the Faculty of Workforce Development*
    - *Classes in Footscray, Werribee, and at the Banksia Gardens Community Centre*
  - What students do you teach?
    - *Mainly 18+, but also teach birth to 5 year olds*
  - What subjects do you teach?
    - *Early childhood care and education with secondary discipline with adult education*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *Using natural cleaning products*
       - *Toxicity levels of such materials*
       - *Recycling*
       - *Reusing materials*
       - *Using natural materials for play*
       - *Conserving water by reusing leftovers for plants*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *Integrating ideas into the lifestyles can take time*
       - *It takes 3 years build experience*
       - *People will not go backwards, for example, go back to using cloth diapers but can instead use environmentally friendly disposable diapers*
  2. Based on your knowledge of the students, what areas do you think they:
     - Know a lot about?
       - *Most students know very little about the environment*
     - Would like to know more about?
       - *Cost effective methods, like using recycled materials as toys because it helps the centres which do not have a lot of funds for resources*
- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
     - *Address scenarios in groups to teach each other, hands on,*
     - *Teacher just moderates and observes, asks questions. After the activity, there is a reflection to discuss what they did and review the information they just learned*
     - *Use field trips, videos or photos as visual aid to help with learning concepts, they must see good practice not just imagine what it is like, give an observation sheet for trips and debrief afterwards*
     - *Went on a trip to the beach, instead of buying beach toys they had to bring recycled bottles to create beach toys out of*

- *Provide the students with lifelong learning style through reflective practices and self evaluation*
- *Have the students create a toolkit of recycled materials which they could use to make puppets or other toys*

4. For projects, how often do the students need guidance and help?
   - *Had an activity to learn to administer medication to young children, teachers had small groups try to do it first with limited guidance and then would discuss it afterwards*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *In class, there is a recycling bin and waste bin, but their use is not perfected*

❖ Other Relevant Points

- *Many recent immigrants continue to act similarly to their country of origin*
- *Students travel together out of hospitality rather than environmental reasons*
- *Inspire the light bulb moment: Asked the students what they used to play with when they were children. The students began to share stories and become very animated about playing outdoors and in nature. They realized that natural materials are great for play, even though as they got older their lives were more focused around manmade materials*
- *New housing lots have very little grass or yards, the space is primarily occupied by the house*
- *The earlier you are introduced and integrated with nature, the more likely it is that you will continue with it*
- *Playgrounds have completely removed their natural setting, including trees and even grass, and instead use synthetic materials thinking it is safer*
- *Do not encourage play with food - can act as a double standard where some less fortunate countries may not have the luxury of food to eat, let alone play with*

Mentors Interview #2

2-2-10

- **Teacher profile**
  - Where do you teach?
    - *Banksia and Glenroy*
  - What students do you teach?
    - *10 students at Banksia, ages 16-19, all 'disengaged' from school (kicked out, hate school, behavioural issues, juvenile justice system)*
  - What subjects do you teach?
    - *Maths, at the moment doing a short program on important environmental issues in Australia*
- **What do the students know about the environment in relation to climate change?**

1. Have you taught any environmental education with your students?
   - If yes, what specifically have you taught your students about the environment?
     - *Physical features of Australia and climate*
     - *Local environment- species around the local creek (through walks)*
     - *Natural disasters- drought, fire, flooding*
   - If yes, have you noticed changes in behaviour after teaching these programs?
     - *Recycling- kids do not take initiative. Even the adults do not recycle properly*
2. Based on your knowledge of the students, what areas do you think they:
   - Know a lot about?
     - *They do not have much, if any, knowledge about environment. They seem to have no interest in anything besides their own personal desires*
     - *For example, when asked about the physical features of Australia, they were unresponsive at first. Eventually, they brainstormed a bit, but only one group could provide an answer (the Blue Mountains and Ayers Rock). They also could not match capitols with state*
   - Would like to know more about?
     - *They are happy to get involved if you give them the information*

- **What are the best tools to engage the students?**

3. What lessons have you taught that motivates and excites the students? How did you teach them?
   - *Very repetitive, brainstorming(if the students don't come from households which are environmental then it will be more difficult)*
   - *Excursions: answering questions and taking photos (have gone to Melbourne Jail, science works, planetarium)*
   - *Physical activities: taking photos, go looking for things outside*
   - *Creative: Posters and presentations*
   - *Use hands-on interactive learning*
   - *Do not respond to group work very well (not keen on showing initiative or taking leadership roles)*
   - *If they are having a bad day, just have them write*
   - *Use simple information and few, explicit directions. Including pictures with text is also helpful*

- *Be aware of their short attention spans and poor listening skills*

4. For projects, how often do the students need guidance and help?
   - *Independent research will most likely not get done*
   - *If given time on computers, it is unlikely that they will use the time for research (as opposed to using Facebook, AIM, etc.)*
   - *Prefer to be given the information, however, they will use research materials with simple text*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *Little interest recycling/saving power*

❖ Other Relevant Points

- *Whole School Approach- they have a list of rules (No mobile phones, respect speaking to each other/teachers)*
- *Behavioural changes happen naturally, otherwise they eventually leave the program*

Mentors Interview #3

2-2-10

- **Teacher profile**
  - Where do you teach?
    - *Tutors students at Banksia for a homework program, runs a girls only soccer group in partnership with Banksia, works with Hume City Council to work with 10 disengaged students for 8 weeks of training, is involved with human rights*
  - What students do you teach?
    - *Grade 1 primary to first year university*
  - What subjects do you teach?
    - *For tutoring you have to teach all subjects*
    - *English is her favourite subject to teach, but also teaches maths and human rights*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *Working on a PowerPoint that relates human rights and climate change*
       - *People must respect the planet in order to continue utilizing its many resources (i.e. water, land, etc.)*
       - *No formal teaching on the environment, however, has taught informally through conversation- telling them about the garden, or taking them to go pick up rubbish*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *One example: she told one boy to respect the Centre and not to litter, and the next day saw the boy teaching his brother the same lesson*
  2. Based on your knowledge of the students, what areas do you think they
     - Know a lot about?
       - *Are the interested? Yes and no:*
       - *No - continuously rubbish outside, speaking to the students about climate change and awareness was not successful - they know that littering is generally 'bad' and that it is important to water the garden, but do not fully respect/understand the importance*
       - *Kids are generally interested in anything: it just has to be explained to them on their level and be fun to learn*
     - Would like to know more about?
       - *Awareness on climate change can be improved*
- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
     - *Make it short and interactive, use simple language*
     - *They like films (enjoy YouTube)*
     - *Do not lecture - even if it is high energy, students will not respond very well*
     - *They like interactive projects (made a tree of knowledge with human rights)*
     - *Make it relevant for them - talk about local issues in Hume (water uses, dry park, look at the rubbish)*
     - *Don't talk down to them, put the information on their level*

- *If you want to know if they are interested in something, ask them!*
- *Students would probably recycle more if it was made more available to them (more bins, etc.)*
- *Learn by example*
- *Encourages students by telling them to take responsibility - "It's your Centre, respect it." (when kids are littering, taking stones, etc.)*
- *Enjoy physical activities and sports*
- *They like "doing stuff" - hands-on activities*
- *Like helping and taking responsibility (cooking lunch at School Holiday Program)*
- *Making movies/watching movies*

4. For projects, how often do the students need guidance and help?
   - *A balance of both, generally they like to go off and do things on their own thing*
   - *Everyone has different learning styles, try to incorporate all of them*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *Depends - during the School Holiday Program most of the young people recycled, however, other times the computer room is littered with paper*
   - *The students will not generally ask where the recycling bin is - if they don't see one, they won't use one*
   - *Kids sometimes turn off computers when they are done*

❖ Other Relevant Points

➢ *They used to have posters saying to turn off the lights- mainly for the office*

Mentors Interview #4

2-3-10

- **Teacher profile**
  - Where do you teach?
    - *Banksia*
  - What students do you teach?
    - *Same sex attracted age 13-23*
  - What subjects do you teach?
    - *I facilitate a group of teenagers*
- **What do the students know about the environment in relation to climate change?**

1. Have you taught any environmental education with your students?
   - If yes, what specifically have you taught your students about the environment?
     - *No*
   - If yes, have you noticed changes in behaviour after teaching these programs?
     - *(N/A)*
2. Based on your knowledge of the students, what areas do you think they
   - Know a lot about?
     - *If anything, probably water because it is mentioned rather frequently on TV as a big issue in Australia*
   - Would like to know more about?
     - *Transport - "there isn't a lot of public transport out here"*

- **What are the best tools to engage the students?**

3. What lessons have you taught that motivates and excites the students? How did you teach them?
   - *Use fun activities such as art projects and screen printing rather than lectures. They like doing things with their hands*
   - *Use an incentive*
   - *Empowerment is used frequently in her group - target people who are doing well, and have them explain it to others. Have them make choices and decisions on what they want to do*
   - *It is important to be comfortable with silence - they may need time to reflect before speaking or it might involve something personal. Do not rush responses*
   - *Be patient with them*
   - *Miracle questions- 'imagine if there was a perfect world- what would you do?'. Can help them come up with some amazing ideas which they can then break down*
   - *Group discussion, narrative stories- let people share their experiences*
   - *Worked well being broken up into smaller groups*
   - *Being aware of the group dynamics - people who might help out others well, or include them more*
   - *Comfortable environment so they are not to afraid to say things*
   - *In some instances, the older kids led groups of the younger ones in the programs*
   - *Do fun things such as 'Getting to Know You" activities - do at the beginning of every session to get everyone to feel comfortable again*
   - *Go to events- go the sustainability festival, then discuss it afterwards*

4. For projects, how often do the students need guidance and help?
    - *They like structure, but they like being able to move freely within the group sessions. For example give restrictive time frames for each activity*
    - *They don't want to be bossed around, be flexible with what you want to teach*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
    - *Don't see them engaging in any activities*

❖ Other Relevant Points

- *The age range is a problem some times because they are at different levels - in terms of knowledge there is not much of a difference, but in terms of maturity there are large gaps*
- *Whoever is in charge should make sure to consult with others every couple of months*
- *Whoever leads the program must have a good understanding of the kids in the group*
- *When people want to join her specific group, they talk to them about mental health etc*
- *Good communication with parents, which is sometimes overlooked, is important to empower students as well as instil the lessons of a program*
- *Hume Connection- similar to Facebook for the people in Hume*

Mentors Interview #5

2-3-10

- **Teacher profile**
  - Where do you teach?
    - *Manager of the Banksia Gardens Community Centre*
    - *"One requirements of running education, I am required to be qualified to teach"*
    - *Sometime teaches when teachers are away*
  - What students do you teach?
    - *Ages 4 to 24 (government definitions)*
  - What subjects do you teach?
    - *Certified to teach anything*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *The subjects that I've taught haven't focused on the environment*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *(N/A)*
  2. Based on your knowledge of the students, what areas do you think they
     - Know a lot about?
       - *Feels its varied - with environmental programs, younger children have more awareness because they have relevant programs in their schools*
       - *It's about the same as other suburbs, not more or less*
     - Would like to know more about?
       - *As long as the information is made relevant to their lives and is meaningful, it will excite them (ideas of poor people debating melting ice caps is not realistic because it doesn't relate to them personally)*
- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
     - *First, introduce things they can personally relate to, then step back into something more broad, and continue in that fashion - Bottom Up Approach*
     - *For example, start by walking outside and seeing rubbish around the Centre, or going somewhere locally and showing them the impacts in their neighbourhood, then going broader with the information from there*
     - *Sitki was involved in making films and art projects, which worked extremely well, but the messages come from them first*
     - *They enjoy experimenting with things and doing hands-on activities*
     - *Do not use the traditional 'I talk you write' learning style*
     - *Excursions, art projects, movie projects (like claymation), cooking, sports*
     - *Good people and good teachers who can motivate and excite*
     - *Good programs are well organized, get the kids hooked right away and keep the kids motivated and enthusiastic. The kids' behaviour will good because everyone is involved and happy*

- *A program's success can also be measured by how many students stay in the program (no dropouts mean its running well)*
- *Keep the kids in a nice learning environment or they "won't feel valued", if there aren't good learning conditions, incorporate why that is in the program*
- *If you really want involvement, it is important to cater to the desires of those involved*

4. For projects, how often do the students need guidance and help?
   - *The claymation projects were entirely independent (made their own models, etc.)*
   - *The project had to be made with claymation and they were involved in picking the topic*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *VCAL: No - they only clean up because they are told, frequently leave rubbish in the rooms, but is unsure whether the reasoning is because they are teenagers or that demographic*
   - *Night time classes (women 17-25): Yes - I've notice practices there. they wash dishes, turn off lights, etc. but motivation to do so is unclear*

❖ Other Relevant Points

- *Have signs about lights and cleaning up, etc. students may be influenced because we instruct them to do those things - link it to a nice clean Centre rather than respect for the environment*
- *Using a carbon footprint calculator - Be mindful of the age groups/maturity levels*
- *Mohammad Ali - did the graffiti art on the centre, big focus on environment, teaches it through graffiti art, he has a group of girls and he allows them to work out what to do even though it is hard*
- *"We can't just do everything for people, at some point they need to do it themselves"*
- *Community garden was part of funding, so it wasn't a choice but based on research. Volunteers have involved themselves*
- *Most of the eco-warriors was getting the building re-done, and distributing shower heads, it's not that people say they need it, but Jaime recognized that it would help them but it's been low success*
- *Eco-warriors is about improving the quality of life- your life should be better, no preaching*

Mentors Interview #6

2-10-10

- **Teacher profile**
  - Where do you teach?
    - *Environmental Education Coordinator for CERES*
    - *CERES – child education campaign*
    - *Encourage going outdoors, rather than sitting inside playing video games.*
  - What students do you teach?
    - *Primary and Secondary school*
    - *Primary - teaches the same programs every year as part of their school curriculum*
    - *Secondary – more project based*
  - What subjects do you teach?
    - *All 70 programs (except for cultural. Focuses mainly on land, waste, and water programs).*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *Yes, "everything we teach is in the outlines of the programs"*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *Yes. Believes that kids learn their behaviour from their parents, but the most significant behaviour change occurs when the teachers are enthusiastic about a subject and can therefore inspire the students to take interest.*
  2. Based on your knowledge of the students, what areas do you think they
     - Know a lot about?
       - *Water – used to be a really popular program, but recently more and more people are aware of the need to conserve water because of the droughts in Australia.*
       - *Some people believe that Desalinization Water Treatments in Melbourne "solved" the drought problems, so they are not as concerned with water conservation as much as in the past*
       - *Might know a lot, but depends on their attitude ("it's not cool for people to know things and speak out" etc.)*
     - Would like to know more about?
       - *Waste and Energy are the programs most often booked by schools*
- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
     - *The most popular programs with the kids are:*
     - *Primary: worms, paper-making, going to the farm, water testing, investigating bugs*
     - *Secondary: energy + fossil fuel activities*
     - *Kids like to do things they usually do not/are not allowed to do at home*
     - *Group activity: students are given guided instructions and allowed to complete it their own ways (Dump Award – taking different materials with excess packaging and decided which is the least environmentally friendly)*

- *Group activity: get two bins - one with local food from Australia, and the other with imported food – and students had to accumulate the total distance the imported food had travelled vs. the local food*
- *CERES tries to refrain from lecture-type teaching and do more hands-on activities*

4. For projects, how often do the students need guidance and help?
   - *(N/A)*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *Generally know to save water and recycle (basic practices)*

❖ Other Relevant Points
   - ➢ *Collingwood Children's Farm*

Mentors Interview #7

2-11-10

- **Teacher profile**
  - Where do you teach?
    - *Banksia*
  - What students do you teach?
    - *Secondary school certificate aimed at getting kids in the workforce, about year 10 age, but at year 6 literacy/education*
    - *Disengaged students who were kicked out of school but have to be somewhere*
  - What subjects do you teach?
    - *Subject to help the students get into the work force: occupational health and safety, vocational prep (resume, work, colleagues), personal development skills, functional reading and writing (i.e. not novels)*
- **What do the students know about the environment in relation to climate change?**

1. Have you taught any environmental education with your students?
   - If yes, what specifically have you taught your students about the environment?
     - *Do a unit on the environment: The basics of climate change and the environment*
     - *Would prefer to use computers, and we try, but because it's a poor school*
   - If yes, have you noticed changes in behaviour after teaching these programs?
     - *"As of now, no" The disengaged student do not care*
2. Based on your knowledge of the students, what areas do you think they
   - Know a lot about?
     - *They have some prior knowledge, but it's not spectacular*
     - *They know the term but not how it happens, they don't see that link*
     - *They know about the recycle/trash bins*
   - Would like to know more about?
     - *They have not shown any interest to learn more about it*

- **What are the best tools to engage the students?**

3. What lessons have you taught that motivates and excites the students? How did you teach them?
   - *Documentaries, hand outs, recent articles, An Inconvenient Truth*
   - *The video "fell on its bum" when they watched it*
   - *Lessons should not be too long*
   - *Used a Simpsons episode about the environment- "winner"*
   - *Use computers with guidance to look up some of the articles*
   - *Give them time at beginning and end for personal computer use to keep them on track*
   - *Using music*
   - *They love stuff about Tupac's lyrics- poetry and analysis*
   - *It has to be relevant and real*
   - *Short documentaries*
   - *Mix it up- chalk and talk, audio, video, understanding, compassion, discussion*
   - *They do not typically do projects*
   - *Don't have the tools, literacy is the focus*
4. For projects, how often do the students need guidance and help?

- *They prefer a lot of guidance and help*
- *Roughly 70% teacher 30% them*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *None, but its "part and parcel of them being 16 years old"*
   - *They say that they do recycle at home*
   - *At the moment, they don't care*
   - *Their self esteem is low*

Mentors Interview #8

2-12-10

- **Teacher profile**
  - Where do you teach?
    - *Banksia*
  - What students do you teach?
    - *Generally 8-24 year olds, sustainability course may have some older students as well*
  - What subjects do you teach?
    - *Introduction to Sustainability course, Study group tutor (maths, physics, chemistry, biology), human rights education*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *Intro to environmental challenges: talk about climate change, water scarcity, ozone layer*
       - *Technological solutions to some of those problems*
       - *Different aspects of sustainability- energy, fuel efficiency, water waste, agriculture, transport*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *Yes with some of the other things we've done*
       - *We've seen some changes, but not sustained in the long term*
  2. Based on your knowledge of the students, what areas do you think they
     - Know a lot about?
       - *Water is very visible in the area*
     - Would like to know more about?
       - *"Very easy to connect with the issue of waste"*
       - *People don't understand the topic of energy fully*
       - *Example: fuel efficiency in cars, choosing the best colour and heat/air conditioning uses less fuel- "what does the AC have to do with the fuel"*
       - *"It is hard to make connections with things they don't really understand"*
       - *"I think in many instances it will have to be our decision what to teach them"*
- **What are the best tools to engage the students?**
  3. What lessons have you taught that motivates and excites the students? How did you teach them?
     - *Popular education, horizontal learning*
     - *"These are some concepts that can be got to through common sense"*
     - *Make the students reach conclusions on their own*
     - *Sharing experiences, working in groups*
     - *Brainstorming*
     - *Incentives: Encourage participation with lollipops, candy*
     - *The first thing a facilitator does is try to get to know the group*
     - *Do some ice breaking*
     - *Ask a lot of questions*

- *To engage young people you need a lot of interaction*
- *Try to ask a question to refocus every 3 or 4 minutes*
- *Example*
- *Divided into groups, gave situations "what would you want to happen if…*
- *Your significant other was denied a job due to the colour of their skin?"*
- *And friend who is same sex attracted is being bullied at school?"*
- *The principle of your school decided to ban all head wear?"*
- *Phrasing was not 'what would you do,' it was 'what practices did they want to be in place'*
- *Be able to talk to teacher/principle*
- *Very successful exercise because it was a real situation that happened or could happen*

4. For projects, how often do the students need guidance and help?
   - *They tend to favour less guidance, but it changes depending on the people*
   - *Use group dynamic to determining how much guidance to give*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)
   - *It changes*
   - *For example, the Turkish ladies did not used to but we told them a few times and it changed*
   - *The VCAL kids are some of the main offenders*
   - *Puspa sprayed tomatoes in the garden with chemicals because he was unaware it was organic*

Mentors Interview #9

2-17-10

- **Teacher profile**
  - Where do you teach?
    - *Banksia, employed by Glenroy Learning Centre*
  - What students do you teach?
    - *2 groups: Disengaged youth at Banksia and Glenroy, Newly arrived adult migrants*
  - What subjects do you teach?
    - *Disengaged youth: reading and writing, personal development skills, Australian environmental issues*
    - *Adult migrants: preliminary course in English, for those who have little to no education in their country of origin, used to teach occupational skills, including health and safety*
- **What do the students know about the environment in relation to climate change?**
  1. Have you taught any environmental education with your students?
     - If yes, what specifically have you taught your students about the environment?
       - *Looking at animals and plants species that have been introduced in Australia and their impact on the ecosystem*
       - *Last year, counted the cigarette butts around Glenroy and developed a poster which was put up in nearby shops, etc.*
       - *It raised the students' awareness*
       - *Gave out ashtrays, but they were stolen within a day*
       - *Yesterday we went on a field trip, walking along Moonee Ponds Creek,*
       - *looked at both native and introduced animals, birds and plants*
       - *looked at "manmade improvements" (drains, and parks and riding paths and barbeques)*
       - *Plaque about the first national school built in Victoria*
       - *Kids had a worksheet to fill out as they went*
       - *They liked it, but only 3 out of the 7 students brought parent permission slips and were allowed to go, even after being reminded multiple times. The other 4 wanted to go, but did not have the forms*
     - If yes, have you noticed changes in behaviour after teaching these programs?
       - *Very occasionally they taunt each other about littering - Not inspired by environment, more inspired by 'having a go at each other'*
       - *"Our programs just raise their awareness a little"*
  2. Based on your knowledge of the students, what areas do you think they
     - Know a lot about?
       - *They have a very basic knowledge, their general knowledge is very poor*
       - *We (the teachers) know very little also, only marginally more than the students*
       - *Had a 5 week spot to fill, and thought environmental issues would fit nicely*
       - *Kids respond well to environmental topics because the information is fairly new to them*
     - Would like to know more about?

- *They enjoyed learning about the Great Barrier Reef and whaling*

❖ **What are the best tools to engage the students?**

3. What lessons have you taught that motivates and excites the students? How did you teach them?
   - *Usually a unit on smoking, alcohol, and drugs- they are reasonably engaged*
   - *They are a little bit interested in empires right now- they choose their own and follow up with a project*
   - *For science: they look at astronomy, biology or technology but they can't understand the text even if it's junior non-fiction (grade 6-7)*
   - *Always go to Scienceworks, but it's not a huge success*
   - *Go to the planetarium*
   - *One project we did was regarding Disability, when the kids had to choose one to research*
   - *Surviving in the Bush- had two different sets of instruction- asked them first to brainstorm their own ideas, and then compared them to the text*
   - *Introduced Specie Project: look at animal and plant species that have been introduced into Australia, then choose and report one to the whole class. Needed to show range, and how is it being controlled. Other students who are listening discuss other ways to handle the species. They engage well with it*
   - *They dislike talking about themselves*
   - *Snapshot from their life, almost everyone resisted*
   - *They love oral quiz games, usually split them into teams (so there isn't one kid who gets none right), give them lolly prizes*
   - *"they love competition" they have to put up their hand to give an answer, if they get it wrong it goes to the other team*
   - *Use interactive activities*
   - *Affirm good behaviour*
   - *Catch them being good: When you affirm one person doing something well, others will then follow his example*
4. For projects, how often do the students need guidance and help?
   - *Every kid is different*
   - *"I give a heap of structure. I try to make it as clear and specific and simple as possible, but it's never simple enough"*
   - *They will continually ask questions you've already answered, they won't read the directions, often go off on tangents*
   - *The projects have to be structured incredibly simply*
   - *For example, I pick the books for them, have them choose 4 topics, then tell them they have 5 minutes to read about the topics and tell the rest of the class 3 things they've learned about them. None of the kids completed the task in the 5 minute time period, so I gave them 1 more minute. After the minute, each student was able to say 3 things about their topic, which was then turned into a quiz for the next week*

❖ **What opportunities are available to participate in?**

5. What environmentally friendly actions do you observe the students taking part in? (Recycling, water saving (toilets, sinks), energy conservation, gardening and animal awareness)

- *(N/A)*

❖ Other Relevant Points
  - ➢ *Tried to get in touch with Moonee Pond Creek Committee but they are focused on history and biology than environmentalism*

Appendix C: Summarized Student Discussion Groups

Discussion Group #1

Date: 9 February 2010
Discussion Leaders: Liz and Ashley
School: Kangan Batman TAFE (24 students)
Year: 12

What knowledge do you already have about the environment?

1. What do you know about the environment?
   - *Drought, pollution, picking up more rubbish, environmental groups, taking the environment for granted, global warming, plastic bags are bad, climate change, GHG emissions, water restrictions, Asians killing whales, energy efficient light bulbs, and that the environment is being destroyed*
2. How would you describe:
   - Climate Change/Global Warming
     - *Shift of weather, warming, no snow, hot summers, milder winters, polluting air, over-using resources, sea-level rises, hole in ozone layer, ice melting, change in weather patterns*
   - Sustainability:
     - *Environment, what we use and what we can put back, carbon footprint* (didn't really know what sustainability was, mostly teachers comments)
3. How do you think your lives are affected by climate change?
   - *Using a water tank, conserving water, suburban, gardens, think about what you're using, grass not as green, the use of shower buckets, turning off light switches, and using less air condition.*

What environmental topics would you like to learn more about?

4. Which of the following is the most interesting to you?
   - Waste: non-renewable sources, landfills (3)
   - Energy: heat, electricity, transportation (4)
   - Water: lakes, streams, ocean, rainfall, human usage (12)
   - Biodiversity: all living things on the earth (plants and animals) (3)
5. Why did you choose Water/Waste/Energy/Biodiversity?
   - Water
     - *Life cycle, everybody needs it, pertinence in Australia, element of life*

Why or why not do you participate in environmentally friendly activities?

6. What do you currently do to help the environment?
    - WATER: How do you conserve water?
        - *Using gray water systems, shower buckets, water-efficient showerheads, efficient toilet bowls, reusing excess water in gardens.*
    - ENERGY: How do you conserve energy?
        - *Walking to school, public transportation, turning off light switches after use, avoiding pollution, it's all about using less greenhouse gases.*
    - WASTE: How do you reduce waste?
        - *Reusing plastic, composting, recycling, in general rubbish lying around everywhere, at home everyone has recycle bins and we are required to use them by law*
    - BIODIVERSITY: How do you preserve nature (land and animals)?
        - *Contributing to bushfire relief, embracing the idea of "Sam the Koala," protest against whaling, losing family in bushfires, planting at home gardens.*
7. Why do you do those things to conserve water/energy, reduce waste, and preserve nature?
    - *Raised to help environment, do my part, make sure there's enough for everyone, financial reasons, saving money, huge increases in present power costs.*

What type of learning is preferred?

8. What was your favourite learning experience from school? It doesn't have to be about the environment, but explain a specific experience and what you did.
    - *Computer and educational games (2), musical instruments (3), arts and crafts (5), sports (2), reading and writing (2), drama-class, claymation, building a tower out of straws, pneumonic devices*
9. Do you prefer to work in a group or by yourself?
    - Individual
        - *You don't have to worry about other people doing work, own ideas, no disagreement*
    - Group
        - *Less responsibility, other peoples' opinions, work is split up*
    - Both
        - *Involved group discussion and then going off of your own and working*
10. How much help do you like your teachers to provide? Why? N/A
11. What type of projects would you like to work with your classmates or neighbours on to figure out how to help the environment?
    - *Scienceworks, planting trees, info-sessions, learning-doing (action-based learning), bubble method (visuals), drawing pictures, addressing problem and then doing something about it, making people aware, legal movement, limited space for waste removal, nature walk (picking up syringes, taking pictures, image*

of what people want needs to change), no more McMansions, word of mouth, documentary, taking things for granted, start off young, critically reviewing the environmental theme behind the movie Avatar, start with yourself, addressing non-responsive government

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Discussion Group #2

Date: 11 February 2010
Discussion Leaders: Liz and Ashley
School: Kangan Batman TAFE (27 students)
Year: 11

What knowledge do you already have about the environment?

1. What do you know about the environment?
    - *Pollution, global warming, natural gases, carbon emissions are bad, plastic bags are bad, trees, plants, have to keep the earth clean, greenhouse gases, climate change, Australia has the thinnest ozone layer, ice caps are melting*
2. How would you describe:
    - Climate Change/Global Warming
        - *Animals need to adjust to changing climate, farmers suffer from drought, and pollution causes climate change.*
    - Sustainability
        - *Using of coal and fossil fuels until they run out, balance in nature, what happens when it all runs out?*
3. How do you think your lives are affected by climate change: N/A

What environmental topics would you like to learn more about?

4. Which of the following is the most interesting to you?
    - Waste: non-renewable sources, landfills (0)
    - Energy: heat, electricity, transportation (11)
    - Water: lakes, streams, ocean, rainfall, human usage (4)
    - Biodiversity: all living things on the earth (plants and animals) (12)
5. Why did you choose Water/Waste/Energy/Biodiversity?
    - Water
        - *Need it to drink, need it to shower, need it to survive*
    - Energy
        - *GHGs, public transport*
    - Biodiversity
        - *Animals are cute, without water there will be no animals*
    - Waste

        Recycle, we need to know how to deal with it

Why or why not do you participate in environmentally friendly activities?

6. What do you currently do to help the environment?
    - WATER: How do you conserve water?

        - *Water tanks, shorter showers, collect water while waiting for hot water when using the faucet, plug the sink for washing dishes*
    - ENERGY: How do you conserve energy?
        - *Turn off power*
    - WASTE: How do you reduce waste?
        - *Recycle, compost, don't litter*
    - BIODIVERSITY: How do you preserve nature (land and animals)?
        - *Plant gardens at home, feed dog*
7. Why do you do those things to conserve water/energy, reduce waste, and preserve nature?
    - *Conserve water because Australia is in a drought, to save money*

What type of learning is preferred?

8. What was your favourite learning experience from school? It doesn't have to be about the environment, but explain a specific experience and what you did.
    - *Scienceworks (games), City Week, reading, full day activities, planting trees, help cleaning up rubbish*
9. Do you prefer to work in a group or by yourself?
    - Group (17)
        - *Open for discussion, you can copy off one another*
    - Individual (10)
        - *It is easier, I am an only child so I prefer to work along*
10. How much help do you like your teachers to provide? Why?
    - (The majority of students didn't enjoy "step by step" instructions when doing projects) *I learned more when I were asked to figure it out on my own, I could be more creative in the outcome*
11. What type of projects would you like to work with your classmates or neighbours on to figure out how to help the environment?
    - *Give information about where rubbish goes when you place it in the bin because we know that it doesn't just disappear, playing with spiders because they're important to biodiversity*

Discussion Group #3

Date: 18 February, 2010
Discussion Leaders: Trevor Bertin and James Ricci
School: Broadmeadows Valley Primary School (17 students)
Year: 5-6

What knowledge do you already have about the environment?

1. What do you know about the environment?
   - *Rubbish (7), the colour green (3), trees (4), helping the world and making it feel better, putting a band aid on an injured thing, frogs, science, forests, grass , planet earth turning, saving the world, the ocean and the little baby turtle, plants saving it, it's going to end in 2012*
2. How would you describe:
   - Climate Change/Global Warming
     - (Majority raised hands for being familiar with climate change, more raised their hand for being familiar with global warming) *global warming is when pollution makes the earth's atmosphere have holes in it and the suns' rays come in, Antarctica is melting, the hole in the ozone layer, gasses from pollution and plastic bags, makes it really hot so the sun's rays can get through the atmosphere, the rubbish makes holes in the ozone layer, when the factories have all the smoking coming out, it makes holes*
   - Sustainability
     - (About 4 or 5 raised their hand that they knew what it was) *to make a balanced world, reduce reuse recycle, solar power*
3. How do you think your lives are affected by climate change: N/A

What environmental topics would you like to learn more about?

4. Which of the following is the most interesting to you?
   - Waste: non-renewable sources, landfills (1)
   - Energy: heat, electricity, transportation (5)
   - Water: lakes, streams, ocean, rainfall, human usage (5)
   - Biodiversity: all living things on the earth (plants and animals) (6)
5. Why did you choose Water/Waste/Energy/Biodiversity?
   - Water
     - *The aboriginals always wanted rain and water, when you get dehydrated you need water, pollute the water, half of the world's animals live in the ocean, if you keep polluting the water they will die, friend went to beach and dehydrated and sick, water can be used as different things, covers 97% of the world, also quite precious, if there's no water people would*

die, 50% water in our body, we need water to survive, so we don't have a drought for drinking and to stay healthy and alive, scientists say water changed when you play music

- Waste
    - *Polluting the world, waste could go down the drain to the ocean and animals could get injured, recycling, throw bottle in river, a tadpole goes into the bottle and grows too big and cannot get out, when you throw plastic bags in the water turtles eat it and they die, fish can get stuck in beer bottle, I saw on the news that a whale ate 2000 plastic bags, Oprah said how everyone is being wasteful and a bird got stuck in a plastic bag and it died*
- Energy
    - *People need it to do anything, need it for electricity, we don't need it- it's not helping the environment, don't need it could use solar power, can be used by many different things and processed by many different thing like solar power generators*
- Biodiversity
    - *We need plants and trees for oxygen, it's not fair, they should used recycled paper because without trees we'll die, we need plants to grow food to keep us living, no food in Africa, the whales and plastic bags, sea animals dying, if they are going to cut down a tree then plant a new one, without animals who will we play with as pets?, since global warming the oceans rose and there's going to be flood, you have to plant a tree every week to suck up the ocean, in Iceland the polar bears die, my mom got a note from the government that says please water every Sunday morning, use grey water instead of clean water for the garden-it's better for the environment*

Why or why not do you participate in environmentally friendly activities?

6. What do you currently do to help the environment?
    - WATER: How do you conserve water?
        - *Got a system that collected grey water, washing machine hose put the water wash to water the grass, showers with buckets use for garden, water tanks, get egg timer during shower to keep it under 30 minutes, use the sink and make a plug to wash vegetables, don't fill up your cup if you only drink water halfway, I don't know why but my mom gets big bottles and freezes the water then uses that instead of the taps*
    - ENERGY: How do you conserve energy?
        - *Turn off the lights when you are not using them, turn of the power if you are not using it, my friend and me use candles, turn off the TV when*

you're not watching it, when its daytime in summer don't use the light open the window shade, instead of taking cars take the bus once in awhile, at night when we close the curtains we have to turn on light, we don't use the heat too much- we wear clothing, use energy saving appliances or use solar power

- WASTE: How do you reduce waste?
  - *Use stick for hiking and pick up rubbish and put it in rubbish bag, if you have rubbish put it in the bin rather than on the ground, when I go to the beach, I pick up rubbish, use the recycle bin, rise bottle and makes things with our recycling, after lunch the teachers say we have to clean up*
- BIODIVERSITY: How to you preserve nature (land and animals)?
  - *We have trees so I water them so they last longer*

7. Why do you do those things to conserve water/energy, reduce waste, and preserve nature?
   - *Save water, save the planet, so that birds and ducks don't get stuck in trees, to save the earth, in Turkey there was a tree and pelican nest and we saw a cat coming for the eggs and so my brother threw a rock to save the eggs, so we all don't die in 2012, my whole family loves animals so we try to save them, I'm a person that likes animals, so I don't want them to die*

What type of learning is preferred?

8. What was your favourite learning experience from school? It doesn't have to be about the environment, but explain a specific experience and what you did.
   - *Running around, doing maths, listening, arts and crafts, moving, you have to pay attention, if you know how to do it then go off and do it, like sports, I don't like hearing teacher talk too much, (most hands raised hands when asked "do you like excursions")*
9. Do you prefer to work in a group or by yourself? Why?
   - Group (9)
     - *Everyone is different, talk to friends about work, get more stuff done, connect and if you don't know they can help answer, if you need help you can go to them*
   - Individual (10)
     - *You can make it your own, you do your own thing, I just want to do my work, sometime groups just talk, you get to do it by yourself*
   - Both (5)
10. How much help do you like your teachers to provide? Why? N/A
11. What are some examples of activities that you would be interested in doing to help the environment?

- *Helping endangered animals, plant tree day, pick up rubbish every day, every week, get money put it in a piggy bank, donate it to the poor, save a pet day- take an animal that needs help, water your plants and especially trees because we need oxygen*

Discussion Group #4

Date: 19 February, 2010
Discussion Leaders: Trevor Bertin and James Ricci
School: Banksia Gardens Community Centre
Ages: 14-20

What knowledge do you already have about the environment?

1. What do you know about the environment?
   - *Trees, surroundings, plants, trees, green, grass*
2. How would you describe:
   - Climate Change/Global Warming
     - *When the climate changes severely, when Antarctica melts down and the water goes around the whole world, I use Venus of an example of global warming- the heat is trapped inside, weather change, pollution (2), something with the atmosphere, causing Antarctica to melt, has something to do with the ozone layer*
   - Sustainability
     - *Have something for a long period of time*
3. How do you think your lives are affected by climate change: N/A

What environmental topics would you like to learn more about?

4. Which of the following is the most interesting to you?
   - Waste: non-renewable sources, landfills (0)
   - Energy: heat, electricity, transportation (0)
   - Water: lakes, streams, ocean, rainfall, human usage (0)
   - Biodiversity: all living things on the earth (plants and animals) (5)
5. Why did you choose Water/Waste/Energy/Biodiversity?
   - Biodiversity
     - *It's interesting, animals, seems different from the rest, living things*

Why or why not do you participate in environmentally friendly activities?

6. What do you currently do to help the environment?
   - WATER: How do you conserve water?
     - *We have the shower head that conserves water (2), take 5 minute shower, use water tanks, shut the water off when you brush your teeth, make sure pipes don't leak, shorter showers*
   - ENERGY: How do you conserve energy?
     - *Turn off the lights when you leave the room, buy power saving electrical appliances, power saving light bulbs*

- WASTE: How do you reduce waste?
  - *Recycle, use the different bins for recycling, trash and lawn clippings, fruits and vegetables can be composted*
- BIODIVERSITY: How to you preserve nature (land and animals)?
  - *Plant trees, clean the environment, I read in article that cows and meats are contributing to the ozone layer but not eating them has little effect- eating less meat may actually cause more problems*

7. Why do you do those things to conserve water/energy, reduce waste, and preserve nature?
   - *Diminishing resources, it more that the government states it over and over, and it has big publicity, I think we are over worrying about the problem*

What type of learning is preferred?

8. What was your favourite learning experience from school? It doesn't have to be about the environment, but explain a specific experience and what you did.
   - *Science experiments, sports, after the teachers explain, learn it interactively, teach it to other people, and apply it to your self*
9. Do you prefer to work in a group or by yourself? Why?
   - Groups (3)
     - *In groups, you can reference other people*
   - Individual (0)
     - *It depends*
10. How much help do you like your teachers to provide? Why?
    - (3 preferred heavy guidance, 1 preferred open ended)
11. What are some examples of activities that you would be interested in doing to help the environment? Our ideas include: Excursions, Design Project, Experiments, Discussion, Merit System
    - *They all sound good, paintballing-two teams: pollution vs. eco-warriors, when you look at community, there's all these ways to make it more sustainable, planting trees, it's the impact of global scale, it's the big issues things that people should worry about*

Appendix D: Qualitative Journal Entries

Journal Entry #1

20 January, 2010

Banksia Gardens Community Centre

Junior Olympics

Jaime told us to expect roughly 20-25 young people at the Centre today, as it turns out there were over 30 youth students present at the Junior Olympics. While their age, four to eighteen years old, and nationality of the youth was very diverse, they all shared a high level of energy and enthusiasm towards the Olympics. During the competitions, because the age groups were split, we found that the students not participating in the competition to be very disengaged. We noted that splitting the age groups, would also require us to find a way to keep them engaged while they were not participating. After the first half of competition, snack bars were given to students as a snack before lunch and many of the snack wrappers ended up on the floor. While the young people were relaxing during lunch, they occupied all eleven computers in the computer room with a group constantly waiting to get on. Those who were not able to get a seat, decided to participate in arts and crafts with Trevor. It seemed like they really enjoyed passing the time by design characters and letting their imagination go free. Following lunch, we began the second half of the Olympics, but found it difficult to conduct because a majority of the students had lost their paper score sheets. With this observation, we noted that giving young people flyers or handouts to bring home would not be a good idea, because there's a good chance that they will lose them.

Journal Entry #2

22 January, 2010

Banksia Gardens Community Centre

Movie Night

On Friday, there were about eighteen to twenty students present at the movie night and were aged roughly from four to thirteen. We planned a presentation for the young people before they started watching a film for Movie Night. Our presentation was relatively short, simply made for the purpose of further introducing ourselves to the kids, as well as explaining to them what we are doing at the Centre for our project. At first impressions, the older aged students seemed annoyed at the idea of a PowerPoint presentation. However, during the presentation, all of the students were respectful. After our small presentation, we made an interactive slide that tested the students on their knowledge of household climate change mitigation. The room displayed four unsustainable actions:

- An air conditioner turned on instead of a fan
- A faucet tap left on
- Recyclables in the rubbish bin instead of the recycle bin
- Cement covering the backyard instead of grass, plants, and trees

The young people were able to pick out all of these mistakes without any assistance from our group. In fact, there were many students who raised their hands to tell us the problems. The younger students were very responsive to our interactive segment, and even continued to give suggestions of further sustainable methods after our presentation was over.

Journal Entry #3

29 January, 2010

Banksia Gardens Community Centre

Rugby Camp

The Rugby Camp activity of the Youth Development Holiday Program at Banksia involved approximately twenty-six young people aged between six and nineteen years old. A couple of rugby players from the Melbourne Storm team came to the Centre in order to lead this event. For this event, all age groups were kept together. This presented a problem because the age groups seemed to have different interests, making it difficult to address everyone.

Despite the players explaining to the young people that they needed to be respectful throughout the program (raising hands, etc.), very few youths obliged their requests. Young people often spoke out of turn, did not follow directions, and occasionally would not abide by the rules of a game. The young people were very difficult to keep under control and there were a few cases where students were physically injured or emotionally put down. On another note, the young people were given snacks at lunch time and watermelon in the afternoon. The snacks, a sort of granola bar, were given to the young people outside. After having opened their snack, if they could not find anywhere to put the garbage, they would simply drop it on the ground.

Appendix E: Descriptions of Edu-Eco Link Program Units

Unit 1: Destination Discovery

Brief Description: This project involves an outdoor excursion to the Moonee Ponds Creek where students will observe the environment and the habitat with cameras and notepads. They will also conduct a pH test from different locations along the creek to examine if there are any sources of pollution.

Materials: pen/pencil, paper, camera, and pH scale (pH Hydrion)

Detailed Description:

Facilitators will take the young people to the Moonee Ponds Creek, where they will be asked to take pictures of the environment, either good or bad. Facilitators should point out key topics of discussion: soil erosion along the creek, the proximity to highway, rubbish, plant life, and biodiversity.

Each group should test the water at a different location along the creek by tearing off a piece of tape no longer than the length of half of their index finger and placing it into the water. The pH scale should be used to determine if the creek water is acidic or basic.

When young people arrive back to Banksia images should be uploaded onto a computer and projected for the classroom to see and discuss. Discussion should be about what attracted them to take the picture, what causes the problem, how it ties to climate change and what they can do about it.

Example discussion:

Picture: Rubbish in the creek

What attracted you to take this picture? What's wrong with the picture?
What do you think caused this? Littering, carelessness, travelled down the creek from a residential area/hangout
How does it affect the environment?

- Biodiversity: Wildlife can get trapped in the rubbish and die
- Water: Blocks the natural flow of water

What can WE do to prevent it? Don't litter, recycle, respect the environment, and pick up rubbish when seen around the Broadmeadows community.
Where does all the rubbish go? Students should visualize a collection point of all the rubbish at the lowest point of the creek. Facilitator should give time to let it sink in and understand the effect of littering a single gum wrapper/cigarette butt. The build up of littering small items in the big picture needs to be seen as a larger problem.

Information on pH testing:

The pH test will show the severity of acidic/basic concentrations in the creek. The pH scale ranges from 1 (very acidic) to 14 (very basic) with 7 as neutral. Most aquatic life dies at pH levels below 3.5 and above 10.5. Testing at different locations will show if it's more acidic or basic at different point locations along the creek. Air pollution from automobile exhaust and burning fossil fuels increases sulphur and nitrogen oxide concentrations in the air, which turns rain into acid rain and thus increases the acidity of a body of water. Pollution from accidental spills, soil erosion, and sewer overflows can also cause a change in pH level. More information about pH testing can be found at
http://www.bpa.gov/Corporate/kr/ed/kidsinthecreek/topics/waterquality/ph.htm.

Key terms to be addressed: soil erosion (runoff), air pollution, acid rain, rubbish, biodiversity, acidic/basic, pH scale, and sustainability

Youth Takeaway: The young people should develop a broad view of different types of pollution (air, rubbish, water) present in their local community. Facilitators should communicate what causes the types of pollution as well as their relation to the pH level of the creek. An understanding of the key terms is vital in order to make the link between local and global environmental issues discussed in later units.

Unit 2: Hands-on Fun

Brief Description: This activity is a collection of interactive experiments designed around educating young people about their local environment and their effects on climate change. There are five activity options available over two weeks for this unit.

Option 1: Leaky Pipe Exercise

Materials: 1 Measuring cup

Detailed Description:

Students will observe and measure water dripping out of a pipe over a short period of time. They will use a measuring cup to collect the dripping water over a period of time (mL/minute). Then, the young people need to calculate how much water will be wasted over the period of a day, month, and year. After the calculations, they will discuss their findings as well as reflect upon the impact of wasted water on the environment. Young people will also be encouraged to return home and perform the same experiment on their household shower, sink, garden hose, etc. and return to the next activity with their results.

Required prior knowledge includes the ability to convert different rates of time (mL/minute to mL/year). The educator will need to provide the young people will basic information about the effects of water on the environment, including information regarding water usage in a home (for instance, the shower is responsible for 30% of household water use, etc.)

Youth Takeaway: The purpose of this experiment is to enlighten young people about the severity of seemingly harmless leaks in relation to conserving water. It also empowers the young people with the ability to make observations and changes at home.

Option 2: Raising Butterflies

Materials: 1 caterpillar, 1 glass jar, leaves and twigs

Detailed Description:

The youths will be required to build a butterfly habitat using a recycled glass jar and natural materials they find in the environment (be aware that some butterflies eat certain plants). Materials for the habitat will be gathered at the start of this unit by exploring the local environment area. When the young people reconvene, they will construct the habitats by placing air holes in the jar's lid for oxygen, as well as adding sufficient food, twigs and other structures for the caterpillar to climb on and hang from when reaching the pupa stage. The caterpillars will be observed over the next 6-8 weeks as they mature into pupas and finally evolve into butterflies.

Upon metamorphosis, the butterflies can then be released outside.

Outcome: Raising butterflies teaches youths about the delicate and complicated characteristics of nature and biodiversity.

Option 3: Planting Trees

Materials: Seeds, recycled materials for plant pots, spades, watering bucket, and fertilizer

Detailed Description:

This particular option could be operated in partnership with a local organization. The young people will collect recycled materials to use as pots for planting trees. Over the course of the program, the youths will need to plant and take responsibility for a tree, beginning with germinating the seeds into saplings. As the trees grow, the students may need to transport the trees into larger pots. When the trees reach appropriate maturity, the young people will bring them to an appropriate land plot in the Broadmeadows community where they can then dig holes and plant their trees outdoors.

Youth Takeaway: Planting trees is important to the environment, as they provide oxygen, shelter, and food sources for other living things. Because people are not careful about their impact on the environment, many trees are being wasted for paper, lumber, and other means. This exercise teaches young people about the importance of preserving nature.

Option 4: Food Kilometres Project

Materials: 1 Local/Organic and 1 Imported: Pasta, sauce, meat, onions, peppers, mushrooms, bread

Detailed Description:

Young people will be presented with two collections of food. One set will be locally grown and harvested, whereas the other will be imported from other areas. They will be told where each food from both collections originated. With this information, the young people will need to calculate the total distance travelled by each collection of food. With this information, the group can speculate about the amount of energy each set of food required to get to them.

Youth Takeaway: Shows young people that energy is more than just electricity and power: everyday choices affect the use of energy. It also teaches the youths that it is easy to find local equivalents to what they get imported which don't affect the environment with as much carbon emissions.

Option 5: Waste Awards

Materials: 1 package of individually wrapped cheese slices, 1 bag of individually wrapped lollies, 1 package of water bottles

Detailed Description:

Young people will be divided into three groups and presented with a collection of packaged groceries. They will need to examine each product and analyse the amount of plastics and other non-recyclable materials used in its packaging. Using their observations, the youths will need to rank each product according to how sustainably packaged they were. Whichever is the least environmentally friendly, will be given the Waste Award. Each team will then briefly explain which product they chose and the reasoning behind their decision.

Youth Takeaway: This activity teaches the young people about the negligence people have regarding the environment. Companies that use non-recyclable packaging are damaging to the environment, which is an issue that could easily be solved by using sustainable materials.

Unit 3: Creative Design

Brief Description: This project allows the youth to express their creativity and see their positive impact throughout the Banksia Gardens Community Centre.

Option 1: Conservation Signs (Recommended for younger youths)

Materials: Coloured markers, crayons, construction paper, scissors, glue, and glitter

Detailed Description: Facilitators will create a competition for students to take their knowledge of sustainable activities and apply their creativity to design pro-environmental signs around the Centre. Depending on the number of participants, there should be one winner for each topic of sustainability (biodiversity, energy, waste, and water). Facilitators should allow the use of any materials the students would like to use including pictures. Winners will have their poster copied, laminated, and placed appropriately throughout the Centre.

Examples for Sign Themes:

- Biodiversity: Signs outside the Centre could ask that people to be mindful of the plants growing in and around the garden so that we can enjoy the food and oxygen they produce
- Energy: Remembering to turn light switches off and completely powering down the computer room (not just standby)
- Water: Remembering to use the correct buttons when flushing toilets and not leaving water on the entire time while washing hands in the bathroom
- Waste: Clear signs for recycling and trash, and information on what can be recycled to be placed on bins

Youth Takeaway: This is the young peoples' first opportunity to apply the lessons they have learned in the first two units and create a visual outcome for the Centre's movement towards a more sustainable way of living.

Option 2: Council Petition (Recommended for older youths)

Materials: Camera

Detailed Description: The young people will be encouraged to choose an issue in Broadmeadows that they believe should be addressed by the Hume City Council. Once the topic is selected, the facilitator will help the young people to research the issue and possibly take pictures to provide evidence of the problem. Then, the young people will work together to create a petition which they will present to the Council which details:

- What the issue is
- What impact the issue has on climate change
- Ways in which the council could improve the situation

Youth Takeaway: This allows the youth to learn about a pertinent local issue as well as understand how to encourage action in their council. By creating a petition which can have a positive impact on their own community, the students will experience how their actions can make a difference for their families, friends, neighbours, and themselves.

Unit 4: Conservation Competitions

Brief Description: Conservation Competitions tests the young people's knowledge in a fun and competitive atmosphere. Each activity has an estimated time, but can be varied to fit a different schedule. Competitions should be split into different ages, or as diverse-aged teams.

Option 1: Recycling Olympics

Materials: 10-1 litre soda bottles, 10 or more aluminium cans, 1 ball (preferable made out of recycled materials), 1 paper ball, mix of paper, cans and clean rubbish

***Event 1*: R-E-C-Y-C-L-E** (10 to 15 minutes)

Detailed Description:

Make a ball out of crushed paper and use a paper-recycling bin for a basketball hoop. It is recommended that five young people play at a time. The first young person takes a shot with the paper ball at the hoop from a place he/she chooses. If he/she makes the shot, the next person tries to make the same shot from the same location. If the second person makes the same shot then the third young person tries the shot and so on until everyone has gone. If everyone makes the shot successfully the ball goes back to the first young person and he/she chooses another spot to take a shot from.

If the first young person missed the shot the paper ball is given to the second person in line and he/she gets to pick where the shot must be taken from. The game continues.

If a young person misses a shot that a previous person had made then that person receives a letter. For the first miss the young person receives an R, the second an E and so on till the young person spells R-E-C-Y-C-L-E. Once a young person spells 'recycle' they are out for the rest of the game. The last person in the game wins.

***Event 2:* Can Drop** (10 to 15 minutes)

Detailed Description:

This activity needs a rubbish bin and a recycle bin for each team (buckets can also be used). The rubbish and recycling bins are separated by a distance specified by the facilitator. Depending on the number of participants, the rubbish bin should be filled with 2 - 5 cans (or more for larger attendance). A young person stands in front of each rubbish bin and has to race against the other young people to recycle each can that was in the rubbish. Only one aluminium can may be held at once. The young person, or team, that recycles the cans the fastest wins.

***Event 3*: Sort-a-Thon** (10 to 15 minutes)

Detailed Description:

For this activity, you need a rubbish bin and a recycle bin (one for bottles and one for paper) for each team (buckets can also be used). Each team gets one of each bucket and a variety of rubbish, paper and cans mixed together in a pile. The team will race against each other and the first team to correctly separate the materials will be the winner.

***Event 4*: Bottle Relay** (25 minutes)

Detailed Description:

The entire group splits evenly into two teams and is separated by a distance determined by the facilitator. One young person from each team starts with a bottle. The students will race back and forth, each time handing off the bottle to the next person in their team. The first team to have everyone race back and forth wins.

***Event 5*: Bottle Bowling** (10 to 15 minutes)

Detailed Description:

Ten 1 L soda bottles will be filled up with water and set up in a triangle on the floor. A ball should be made out of recycled materials if possible. The young people will compete in a bowling competition and the person with the highest score wins. The water used to fill the bottles should be used to water plants after activity is done.

These activities were adapted from
http://web.me.com/andydorn/adorngeo.com/Recycling_Olympics.html

Youth Takeaway: The Recycling Olympics provides a fun opportunity for youth to learn about recyclable materials as well as fun ways to reuse materials in a sustainable way.

<u>Option 2: Household Trivia Game</u>:

Materials: 5 poster boards , 20 Velcro strips , coloured markers, crayons, scissors, and glue

Detailed Description:

The participants will begin by splitting up into 5 groups with diverse ages in each. Each group will have one piece of poster board and will be required to draw one of the following:

- Kitchen

- Bathroom
- Bedroom
- Front yard/Driveway
- Study/Computer Room/Office

Once all groups have finished, the facilitator will combine these drawings to make a mock household. The facilitator will help the participants put pieces of the back half of the Velcro on as many of the following which the young people drew in their pictures:

- Kitchen
    - Refrigerator
    - Microwave
    - Oven
    - Sink
    - Dishwasher
    - Rubbish bin
    - Recycling bin
- Bathroom
    - Toilet
    - Shower
    - Washer/Dryer
- Bedroom
    - TV
    - Light switch
    - Air conditioner
- Front Yard
    - Car
    - Gardens
    - Sprinkler/hose
    - Litter
    - Trees/grass
- Study/Computer Room/Office
    - Computer
    - Paper

Now the facilitator will break the group up into two groups and each of them will get 10 fact cards about the appliances which have the Velcro on them. Sample facts* are listed below:

- Fact 1: This uses between 10-15% of the household's total electricity (Refrigerator)

- Fact 2: This uses more energy each year on standby than it does in actual operation (Microwave)
- Fact 3: Switching from electric to gas for this reduces greenhouse gas emissions by 50% (Oven)
- Fact 4: 1% of total global emissions comes from the standby mode on this (Computer)
- Fact 5: Using this 6 hours a day can generate half a ton of greenhouse gases each year (TV)
- Fact 6: This generates around 1,000 kilos of greenhouse gas each year (Lighting)
- Fact 7: By not using this, you could save up to $42 each month on your energy bill (Air conditioner)
- Fact 8: Each gallon of gas used by this puts 9 kilos of carbon dioxide into the atmosphere (Car)
- Fact 9: You can save $20 each year by using cold water in this appliance (Washer/Dryer)
- Fact 10: Up to 50% of household water is used by this, and may use as much as 1000 litres of water per hour (Sprinkler/hose)
- Fact 11: The largest daily use of water, about 45% of indoor water, in the home is this (Toilet)
- Fact 12: After 10 minutes, this appliance has used 50 gallons of water (Shower)
- Fact 13: Uses 7.5 litres/minute (Sink)
- Fact 14: This uses half the energy and one sixth the water of using the sink (Dishwasher)
- Fact 15: 50 bags of this cause 1 tonne of carbon dioxide to be released into the air (Rubbish)
- Fact 16: Doing this can save 1088 kilos of carbon dioxide each year *(Recycling bin)
- Fact 17: This costs Victorian councils nearly $22,000 a day to clean up (Litter)
- Fact 18: Using this, you can reduce your food-miles to zero (Garden)
- Fact 19: The chlorine-intensive bleaching used to make this is the worst water polluter in the world (Paper)
- Fact 20: This will absorb almost one tonne of carbon dioxide during its lifetime (Trees)

The two teams will then race to put their fact cards on the corresponding piece of Velcro. Once the teams have placed all of their cards, the facilitator will go through each room and discuss each of the correct facts and their match. After all facts have been discussed, the facilitator will ask each student to choose the fact that they were most surprised by and explain what simple actions can be done to reduce their impact.

Youth Takeaway: From this activity, the young people will be presented with some statistics which are pertinent to them which can help them realize how much of an impact their actions

have on waste, water, energy and biodiversity. It also sparks the discussion about how small actions can make a difference on the larger scale.

*The suggested facts were found at the following websites
Fact #1: http://www.greenpeace.org/canada/en/campaigns/climate-and-energy/solutions/energy-efficiency/12-steps
Fact #2: http://www.yourhome.gov.au/technical/fs61.html
Fact#3: http://www.epa.gov/climatechange/wycd/home.html
Fact #4: http://globalwarming-facts.info/50-tips.html
Fact #5: http://www.ofbrc.com.au/documents/Sustainabilityinthehome.pdf
Fact #6: http://www.aware.asn.au/vic/page17-20.pdf
Fact #7: http://www.aes-pl.com/get/cent-a-meter/__data/page/6112/Centameter_Energy_Costs-WEB.pdf
Fact #8: http://www.epa.gov/greenvehicles/Aboutratings.do
Fact #9: http://www.powerscorecard.org/reduce_energy.cfm
Fact #10: http://www.wdrc.qld.gov.au/services/saving_water_outside.shtml
Fact #11: http://www.aacounty.org/DPW/Kids/houseWater_waste.cfm
Fact #12: http://www.showermanager.com/shower.shtml
Fact #13: http://www.goulburn.nsw.gov.au/files/1851/File/howmuchwaterfinal.pdf
Fact #14: http://www.sustainablebuildingcentre.com/forum-topic/dishwasher_vs_handwashing_the_winner
Fact #15: http://www.docstoc.com/docs/26124657/Estimate-your-family%C3%A2%E2%82%AC%E2%84%A2s-carbon-footprint-by-working-out-ho
Fact #16: http://globalwarming-facts.info/50-tips.html
Fact #17: http://www.ecorecycle.sustainability.vic.gov.au/resources/documents/051017_Litter_Statistics.pdf
Fact #18: http://ezinearticles.com/?10-Ways-to-Help-the-Environment-in-Your-Garden&id=665746
Fact #19: http://www.treecycle.com/recycling.html
Fact #20: http://www.carbonify.com/carbon-calculator.htm

Unit 5: Environmental Excursion

Brief Description: The excursion in this unit is meant for the young people to experience global environmental issues as well as learn ways to reduce their impact on the environment. Further group discussions on these excursions can be held during the discussion group in Unit 6.

Option 1: CERES

Materials: Pen, paper, and camera

Detailed Description:

The young people will go to CERES in order to better understand the impact of human activity on the environment. Depending on whether the students will participate in a full, three-quarter, or half day, different activities will be included. In this particular unit, the students will focus primarily on the use of energy and fossil fuels, or water. Energy activities include a demonstration about coal as a non-renewable resource as well as peddling a bike to power small household items. Activities concerning water include collecting water bugs and taking a walk around the nearby creek. A detailed list of activities can be found on the CERES website at www.ceres.org.au .We also encourage that the facilitator create a list of guided questions for the students to complete during the day to reinforce the important concepts.

Youth Takeaway: Activities at CERES not only inform young people about the environment, but also inform them of ways to reduce their impact.

Option 2: Scienceworks

Materials: Pen, paper, and camera

Detailed Description:

As part of their visit to Scienceworks, the young people will be involved with the 'Our Living Climate' forty minute planetarium show, which explores the history of the Earth's climate. After the presentation, students can briefly reflect about how their lives and actions are related to the global realities. Again, we encourage guiding questions for the students to answer during or following the trip to reinforce the concept of how they are connected to the global issues.

Youth Takeaway: The planetarium show will teach the youth about the Earth's climate as well as how human action affects it.

Option 3: Melbourne Zoo

Materials: Pen, pencil, and camera

Detailed Description:

The young people will be lead in a group around the Melbourne Zoo. Throughout the tour, young people should take note of what animals are listed as endangered, and read about the reasons on the informational plaques. If no relevant information is given on the plaques, the youths should discuss the reasons for the threat as a group as well as discuss different ways that people can change their behaviours to preserve that species. This information can be recorded on a guided question sheet that the young people can fill out during the excursion. At the end of the trip, the facilitator should ask the students to recall which of the endangered species was their favourite and one thing they learned at the zoo.

Youth Takeaway: By going to the zoo, students can see and read about different endangered species around the world.

Option 4: Beach

Materials: Beach toys (spades, buckets, etc.) made from recycled materials (plastic bottles)

Detailed Description:

In order for students to be able to attend the beach excursion, they need to provide their own beach toys. These toys, however, cannot be typical plastic buckets and spades, but rather made from recycled materials. For example, if one youth's parent has an old pot they do not use any more, or a cleaned yogurt container, they can use those as materials at the beach.

Youth Takeaway: With this exercise, young people can learn about different ways to enjoy the same activities they usually do at the beach, but with less impact on the environment. By avoiding the use of plastic buckets and other traditional toys, the young people can understand the importance of reusing things they would otherwise discard.

Unit 6: Global Reflection

Brief Description: This activity gives the young people time to look back on everything that they have done in the program and reflect on what they have learned and how their actions have changed.

Materials: Computer access

Detailed Description:

The discussion group should have structured questions to keep the young people talking if they run out of topics. Organize young people in a circle inside or outside. Ask open ended questions or direct questions followed by a why or how. Ensure that the young people have time to think about each question and keep probing for deeper answers to really get the young people thinking.

Suggested discussion group topics/questions:

- What would a perfect world be like?
    - Have the young people describe their perfect world. Relate everything back to the environment and how they would achieve it. For example they might say a perfect world is green, ask them how they could reach that goal or if they want a house full of video games ask how they would power everything.
- Scenarios: If some scenario happened, what would you want to happen? This should encourage the young people to talk about experiences they have lived through and what they could do in similar situations. Some example questions are:
    - Examples:
        - If you saw someone littering what would you want to happen? How could this come true?
        - If you saw someone running excess water or wasting water what would you want to happen?
- Evaluating own actions
    - With the use of a computer young people can evaluate how many Earths it would take for everyone to live like they do currently. The young people can then re-evaluate how they would like to live when they are older and discuss how the two evaluations differ. A carbon footprint calculator can be found at
    - http://www.wwf.org.au/footprint/calculator/

Youth Takeaway:

After completing five units of the Edu-Eco Link program the young people can reflect on what they are taking away from the program and how it is contributing to their lifestyle.

Unit 7: Spreading Sustainability

Brief Description: This activity is a design project incorporating all of the young people's acquired knowledge and experiences from the program into a video about climate change and encouraging sustainable practices.

Materials: Video camera, computer with video editing software

Detailed Description:

The young people are given the creative freedom of producing and filming their own movie about the environment. In the video, the young people must address all four areas of the environment (energy, water, waste, and biodiversity), including how each threatens, or is threatened, by climate change, how human interaction magnifies this threat, and, finally, anywhere from four to five different simple, low-cost ways to mitigate each topic in relation to the environment. As an incentive, the young people will be able to post their completed video on YouTube, where it can be viewed by the public. Also, the video will be brought and presented to the Hume City Council as well as at a movie premiere night held at the Banksia Gardens Community Centre.

Youth Takeaway: This allows the young people to express themselves creatively while accumulating the knowledge they have learned throughout the program. The end result is a visual outcome that the young people can be proud of and show others.

Appendix F: Edu-Eco Link Estimated Budget

	Activities	***Supplies***	***Price***		***Total Price per Person****
Unit 1	Discussion	Pens/Pencils[1]	$0.88		
	Discussion	Note Paper[1]	$2.84		**$0.46**
	Excursion	Cameras[12]	$0.00		
	Excursion	Transportation Costs[2]	$2.70		
	Water test	pH strips[7]	$26.25		**$3.69**
Unit 2	Leaky Pipe	Water containers[13]	$0.00		
		Beaker/Measuring cup[9]	$3.00		**$0.15**
	Butterfly	Boxes[13]	$0.00		
		Caterpillars[14]	$7.00		**$7.00**
	Planting	Tree seeds[6]	$10.00		
		Pots[13]	$0.00		
		Spades[13]	$0.00		
		Watering bucket[13]	$0.00		
		Fertilizer[8]	$26.00		**$1.80**
	Dump Awards	Individually wrapped cheese slices[15]	$3.00		
		Pack individual wrapped lollies[15]	$3.00		
		Package of water bottles[15]	$5.00		**$0.55**
	Food Miles		*Imported*	*Organic*[16]	
		Pasta[15]	$1.00	$1.32	
		Sauce[15]	$4.00	$5.28	
		Meat (optional)[15]	$6.00	$7.92	
		Onions[15]	$2.68	$3.54	
		Peppers[15]	$5.00	$6.60	
		Mushrooms[15]	$4.00	$5.28	
		Bread[15]	$3.25	$4.29	**$3.01**
Unit 3	Signs	Markers[1]	$4.62		
		Crayons[1]	$9.49		
		Construction paper[1]	$3.99		
		Scissors[1]	$4.99		
		Glue[1]	$4.26		
		Glitter[1]	$12.49		
		Laminate[10]	$20.00		**$3.08**

Unit 4	Recycle	Clean Recyclables[13]	$0.00	
		Bins/Rubbish cans[12]	$0.00	**$0.00**
	Trivia	Poster board[1]	$14.99	
		Velcro Strips[1]	$3.19	**$0.91**
Unit 5	CERES	Full Day CERES Admission[3]	$18.00	**$23.60**
		¾ Day CERES Admission[3]	$15.00	**$20.60**
		½ Day CERES Admission[3]	$10.00	**$15.60**
		Transportation Costs[2]	$5.60	
Unit 5	Scienceworks	Admission for Scienceworks[4]	$11.00	
		Transportation Costs[2]	$5.60	**$6.15**
	Zoo	Admission for Zoo[5]	$12.10	
		Transportation Costs[2]	$5.60	**$17.70**
	Beach	Transportation Costs[2]	$5.60	**$5.60**
Unit 7	Video	Production Materials[12]	$0.00	
		Video Camera[12]	$0.00	**$0.00**

* The total price per person is based upon a program with 20 participants

[1]According to www.officeworks.com.au

[2]According to 2010 Metlink Fares and Travel Guide

[3]According to www.ceres.org.au

Minimum cost $360, Full day (4 activities, snack & lunch) 10am-2:30pm

Minimum cost $300, 3/4 day (3 activities, snack & lunch) 10:30am-2pm

Minimum cost $200, 1/2 day (2 activities, snack) 10am-12:15pm, 12:30-2:45pm

[4]According to www.museumvictoria.com.au/scienceworks

[5]According to www.zoo.org.au/MelbourneZoo

[6]According to www.seedworldaustralia.com.au

[7]According to www.microessentiallab.com

[8]According to www.Lemahpark.com.au

[9]According to www.NutriSoil.com.au

[10]According to www.ssapl.com.au

[11]According to www.oo.com.au

[12]The Centre already has these materials, so there is no cost

[13]These are recycled materials

[14]According to http://educationalscience.com/butterflycultures.htm

[15]According to the Coles Supermarket in the Broadmeadows Shopping Centre

[16]According to www.abc.net.au/local/stories/2008/08/29/2350525.htm

Appendix G: Edu-Eco Link Partnership Information

We believe partnerships with the following schools' curriculum would parallel well with the activities of the Edu-Eco Link Program and provide for a more diverse and populated learning experience:

Broadmeadows Valley Primary School

Broadmeadows Valley Primary School could be a prospective sponsor for the Edu-Eco Link program because of its close proximity to the Community Centre and its facilities would complement the program activities. Broadmeadows Valley has areas for discussion groups, wet areas for hands-on activities, such as art and science, and technology areas with laptops and internet access.

Address: Broadmeadows West Primary
56-98 Johnstone St
BROADMEADOWS, VIC, 3047
Principal: Andrew Jones
Phone: 9309 4066 or 9309 4444
Email: N/A

Roxburgh College

Roxburgh College's Secondary School has four units that stress the characteristics of the environment and the cause and effect of human activities on the Earth and its resources. Roxburgh College would benefit from this partnership because their field excursions, reports, and discussions on global events fit well with the themes of our last three units which explore the connection between local and global issues

Address: Cnr Thomas Brunton Parade & Donald Cameron Drive
Roxburgh Park 3064
Principal: Mr Fernando Ianni
Phone: 9930 8100
Email: roxburgh.co.roxburgh@edumail.vic.gov.au

Ilim College

Ilim College's Primary School has programs on the local environment which correlate well with the first four units that stress local issues and ways to take a stance against them. Ilim College would benefit from this partnership because the Edu-Eco Link Program will expand their classroom learning and further their understanding by applying their knowledge to the local field excursions and the hands-on experiments.

Address: 30 Inverloch Crescent, Dallas
VIC 3047, Australia
Principal: Yusuf Kirca
Phone: 03 9302 3770
Email: info@ilimcollege.vic.edu.au

Hume Central

Hume Central School could be a prospective sponsor for the Edu-Eco Link program because similar to the Broadmeadows Valley School, is in close proximity to the Community Centre and its facilities would complement the program activities. Hume Central has areas for discussion groups, wet areas for hands-on activities, such as art and science, and technology areas with laptops and internet access.

Address: Town Park Campus, Erinbank Cres.
Broadmeadows 3049
Principal: Glenn Proctor
Phone: 9309 6855 or 9309 1988
Email: N/A

Hume City Council

The Hume City Council organizes events that the Edu-Eco Link Program could partner up with. For example, if the young people want to do tree planting in Unit 2: Hands-on Fun, the council has community tree planting. The event is National Tree Day and is Australia's largest community tree-planting event. The event is organised by Hume City Council, Melbourne Water and the Moonee Ponds Creek Coordination Committee. Partnering up with the Council would eliminate the cost of buying trees for the activity. The Hume City Council also has a wealth of information on its website on all topics of the environment that could be drawn on for the program. The link is: http://www.hume.vic.gov.au/Page/Page.asp?Page_Id=63

Address: Hume City Council
PO Box 119 Dallas 3047
Phone: 03 9205 2200
Email: email@hume.vic.gov.au