

TRANSFORMING THE COMMUNITIES OF TOMORROW

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Abstract

The exponential globalisation of the economy warrants the formulation of a pathway that harnesses the human and social capital that can work together collaboratively and proactively to promote the development of sustainable communities. Education for Sustainability presents that pathway to ensure transformation of the current human and social capital thus fostering change in society and helping build communities that can be more sustainable in all aspects. However the power of education in achieving sustainable development has been seriously undermined indicated by the relatively slow implementation of sustainability concepts in most educational curricula.

This paper elaborates the importance of education for sustainability and expounds on an Applied Technology degree offered at Unitec, New Zealand. Based on a qualitative study the research corroborates that student's perspectives and opinions on sustainability undergo significant transformation when concepts of sustainability are embedded and integrated in the curriculum. The findings demonstrate that educating the current student generation is essential for manoeuvring the community towards sustainable development.

Keywords: Education for sustainability, transformation, sustainable community development, student perspectives.

1 INTRODUCTION

The natural environment is constantly under pressure and continually degraded through human activities. According to Thomas and Nicita (2002), since the 1970's scientific evidence has indicated that human behaviours and activities are having significant impact on the environment. Strauss (1996) stated that the environmental impacts are lethal enough to cease sustaining life in the future. As a result of increased environmental degradation and growing concern for the state of the natural environment, all participating countries at the 1992 Earth Summit in Rio agreed to take action to reduce the impact of human activities on the environment (UNCED, 1992).

It was during the Rio summit that Agenda 21 was derived which focused on sustainable development and outlines actions to be taken "globally, nationally and locally by organisations of the UN, governments, and major groups in every area in which humans impact on the environment" (United Nations Department of Economic and Social Affairs (UNDESA), 1992, para 1). Sustainable development in the above context is defined as "development that meets the needs of the present without compromising future generations to meet their own needs" (Bruntland, 1987, p.43). The Earth Summit identified education for sustainability (EfS) as "critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision making" (UNDESA, 1992, para 3).

Education for sustainability "encompasses a new vision of education that seeks to empower people of all ages to assume responsibility for creating a sustainable future" (Parliamentary Commissioner for the Environment, 2004, p. 36). Moore (2005) defines education for

sustainability as a “process of creating a space for inquiry, dialogue, reflection, and action about the concept and goals of sustainability” (p. 78). Therefore EfS is educational processes and systems that help to transform people’s mindset and motivate them to practise sustainability in all facets of their lives.

It has been recommended that concepts of sustainability should be incorporated at all levels of education (United Nations, 2002). In the 2002 Earth Summit it was noted that incorporation of sustainability education into the current education curricula had been relatively slow. Thus the years 2005 to 2014 was declared by United Nations Educational Scientific and Cultural Organization (UNESCO) as the Decade of Education for Sustainable Development (Parliamentary Commissioner for the Environment, 2004). During this decade, many countries aim to promote sustainable education at all levels of society on the basis that education can help achieve a sustainable future and provide equal opportunities for the present and future generations.

1.1 Present Students are Future ‘Community Shapers’

Tertiary institutes help prepare graduates for entry into government, business and industry sectors and if they are able to transform these graduates into sustainable citizens then a sustainable world will be more achievable. Graduates design the systems where people, live, play and work. Graduates from tertiary institutes teach in schools, contribute to research and develop technologies and techniques for social and economic development (Parliamentary Commissioner for the Environment, 2004). Cortese (2003) emphasises that higher education institutions bear a profound, moral responsibility to increase the awareness, knowledge, skills, and values needed to create a just and sustainable future. Higher education provides unique academic freedom and possibilities of experimenting with many innovative ways to educate its learners about sustainability education.

Malhadas (2003) suggests that to promote sustainable development a change in curricula is needed with the objective “to infuse the notion of citizenship by inserting in the curricula clear proposals and directions to improve the quality of life and preserve the environment, with social justice and economic opportunity, balance of natural resources consumption, equity and education for all” (p. 3).

1.2 Transformative Learning for Sustainable Communities

Sterling (2001) suggested that a systemic change of educational culture towards the realisation of human potential and the interdependence of social, economic and ecological wellbeing can lead to transformative learning. Sterling recommended that educational methods that transform students’ perspectives and viewpoints about sustainability will help create a sustainable future. Sterling’s vision is similar to transformative learning theorised by Mezirow (2000).

The theory of transformative learning states that teaching methods that allow learners to go through a process of critical reflection ensures a change in their thinking (Mezirow, 2000). Transformative learning occurs when individuals change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds (Dover, 2005). O’Sullivan (1999) defines transformative learning as experiencing a deep, structural shift in an individuals thought, feelings, and actions which results in a shift of consciousness that dramatically and irreversibly alters our way of being in the world. Transformative learners can undergo change in their outlook on life and their relationship with others, with the natural environment and analyse alternative approaches to living. It involves deeper critical reflection

and forward thinking. Therefore educational methods that help convert individual thoughts and perspectives are required if everyone is to be educated for sustainable development.

2 THE RESEARCH

Education is the pathway for sustainable community development and current students hold the key to making it a reality. Sterling (2001) recommends a transformative education for all where graduates acquire underpinning knowledge of sustainability with the ability to apply these concepts into their future careers thus contributing towards a sustainable community. Therefore it was essential to investigate the extent of transformation in student thinking that the current educational curriculum provided in terms of sustainability.

Hence research was conducted to obtain the perceptive of students in an applied technology degree and to evaluate whether their programme of study had been transformative enough to foster change in their thinking on sustainability. For the purposes of discussions in this paper, sustainability is focusing on the environmental dimensions and ensuring all practices in society consider reducing the negative impacts on the environment.

2.1 The Case

The Bachelor of Applied Technology programme offered at Unitec Institute of Technology was selected for the purposes of this research. The programme contains specialised courses in Automotive Engineering, Building Technology, Electrotechnology, and Marine Technology as well as generic courses such as communication, sustainability, societal context, health & safety, employment skills, and project management. Concepts of sustainability are embedded in majority of the generic courses in the Bachelors programme therefore encouraging students to incorporate the concept into all levels of their degree. This also ensures that students understand and can apply sustainability concepts within their chosen specialisation.

In the first year of their degree programme students undertake a course titled “Communication, Problem Solving and Health & Safety” which becomes the stepping stone for their journey on sustainability. The major assessment in this course is a group project where students work on the given scenario (Figure 2.1.1) and design an innovative eco-friendly product or service within their own area of specialisation. In this semester based course students are given all required background information on sustainability in addition to covering the course syllables.

It is envisaged that through the above scenario students will be able to apply concepts of sustainability within their own disciplines and understand the applicability of the concept in all fields. Therefore it was important to evaluate whether students undergo transformation in their thinking and attitude towards sustainability after completion of the above project and whether this reformation continues through to their final year of the Bachelors programme.

2.2 Methodology

The research followed a qualitative approach which according to Creswell (2007) begins with “assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems enquiring into the meaning individuals or groups ascribe to a social or human problem” (p. 37). Neill (2006) says that the qualitative approach is a way to gain insights through discovering meanings by improving our comprehension of the whole and explores the richness, depth, and complexity of phenomena (para.4).

Figure 2.1.1 Eco-friendly product design scenario given to students.

Scenario:



Our Finite World

Limited space
Limited resources
Growing population

Project:

What is **ONE** of the **BIGGEST PROBLEMS** facing your **INDUSTRY** today?

Investigate this problem and develop a **creative solution** in your project teams. You will present your idea to the ‘*Our Finite World*’ panel to try and secure funding for your proposed solution. In order to achieve funding your product must meet the following criteria:

Your product must be:

1. **NEW / UNIQUE** – It does not exist at the moment.
2. **CREATIVE / INNOVATIVE** – It may use existing technology or systems in **DIFFERENT** ways. It can be a new application of an existing idea. It is imaginative, exciting, ground-breaking, thoughtful...
3. **ECO-FRIENDLY** – It is environmentally friendly.
4. **NZ-SPECIFIC** – It is developed within the laws and regulations specified in NZ.

Questionnaires were selected as a data collection technique. Cohen, Manion and Morrison (2007) mentioned that questionnaires can be administered without the presence of the researcher and are often straightforward to analyse. Questionnaires give students the flexibility to answer it at their convenience and honestly without any outside pressure. Cohen, Manion and Morrison (2007) say that “qualitative, less structured, word based and open-ended questionnaires are more appropriate as they can capture the specificity of a particular situation” (p. 247-248). Therefore a semi-structured questionnaire was selected for this research so that respondents answered both closed ended structured questions and open ended qualitative questions. This semi-structured questionnaire allowed generation of statistical data for comparison purposes and also generated a good spectrum of student opinions and perceptions on the concept of sustainability.

2.3 Sampling

The total sample size was 60 students from the Bachelors programme in 2008 and ranged from year 1 to year 3 enrolments. Students completed questionnaires which were administered by a third party and participation was voluntary. The questionnaires were evenly distributed among the three degree years with each year being allocated 20

questionnaires. This ensured that the feedback generated represented the whole Bachelors programme. The pre-requisite for participation was the successful completion of the “Communication, Problem Solving and Health & Safety” course.

3 THE TRANSFORMATION

The research generated highly positive results through the questionnaires. The most overwhelming finding of this research was the increased student optimism about sustainability and their valuation of its current and future relevance. This optimism can be attributed to heightened awareness about the concept through the degree programme at the researched institute. With greater awareness about the concept students were more enthusiastic to practice sustainability in their future workplaces. This indicates that if concepts of sustainability are incorporated in the tertiary curriculum then it will initiate a transformation in students thinking.

The transition is most evident in student’s definition of sustainability. The understanding of the concept of sustainability became more comprehensive with students progress through the degree programme changing in essence from year one to year 3 (refer to Table 3.1.1). Student’s definition of sustainability appeared simple and focused on environmental dimensions in their first year becoming more complex and holistic as they progressed to the third year. The third year student had more exposure to sustainability concepts hence their definitions focused on a combination of environmental, social, and economic attributes.

Table 3.1.1 Transformation in student’s definitions of ‘sustainability’ through the programme.

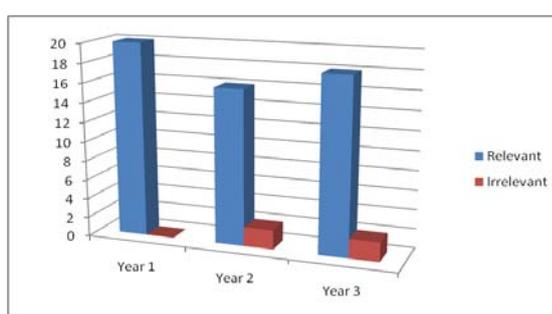
Year of Study	Comments
1	Using materials and resources wisely. Keeping nature as it is. Protecting our environment. Maintaining our resources. Using environmentally friendly technology.
2	...save lots of resources for the future. ...recycling, environmental friendly. ...being green.
3	...environmentally friendly procedures and practices, recycling and reusing. ...using resources wisely. ...meet the needs of present without compromising the needs of future generations. ...coexisting with environment. ...keeping environmental supply and demand in equilibrium.

The change in their perspectives and definitions of sustainability can be accredited to greater awareness about the concept and educational methods that encourage a change in thinking. Therefore awareness revolutionised student opinions and the values they placed on sustainability. Sterling (2001) suggested that educational methods that transform students’ perspectives and viewpoints about sustainability will help create a sustainable future. A third year degree students comment that *‘The first sustainability paper (Communication, Problem Solving and Health & Safety) I took sparked a real urgency’* is a reflection of the kind of change awareness can create. Therefore evidently educational methods and a curriculum that allows students to work on collaborative environmental projects designed to encourage lateral and critical thinking could hold the key for transformative learning.

Students found sustainability an important concept in education and relevant to all disciplines. The graph presented in Figure 3.1.1 clearly indicates that more than 85% students agreed that sustainability had a significant role in the present and the future. Since students

have been educated about the concept and recognised the relevance of sustainability in today's society they considered it to be highly relevant. Comments such as 'Yes, because trade studies are the way to create new products so it's good to relate [to sustainability]' and 'Yes, but everyone should be taught about sustainability at university and at work' are reflections of student's views on the relevance of sustainability at all levels of society. Student's positive feedback on the subject indicates that teaching methods and assessments that require project or problem based learning in a collaborative environment initiates a process of critical reflection ensuring a conversion or change in their thinking.

Figure 3.1.1. Students' perception on the relevance of sustainability in education.



Today's students are tomorrow's future and can help reshape society into being more sustainable. Cortese (2003) stated that higher education can produce graduates that can help shape a sustainable future and make the world a better place to live. With transformative learning educational institutes can produce graduates that can make the community more sustainable. This is illustrated when 80% students from year 1, 100% from year 2 and 100% from year 3 considered practicing more sustainably in their future workforce. It has been highlighted by this research that with greater awareness about sustainability in the student population creates a mind shift, making them more optimistic towards the concept and increases the possibility of them being more eco-friendly. It can be envisaged that with this change in perceptive graduates entering the workforce will be 'sustainability savvy'. Increased knowledge and awareness can motivate graduates to be sustainable practitioners hence contributing towards a community in which or where human activity is consciously or unconsciously directed towards sustainability.

The relatively slow implementation of sustainability concepts in most educational curricula obviously undermines the power of education in achieving sustainable development. 2010 marks the mid-point for the decade of education and still the concept of sustainability remains vague and non-existent from many educational programmes in New Zealand (Stone and Baldoni, 2006). This lack of education presents the drawback for sustainable development. According to majority of the students, sustainability education should be emphasised at all levels of education.

Everyone should be taught about sustainability at university and at work.

I think it should be integrated into all generic papers as well as specific papers.

Sustainability should be introduced at entry level of any trade related course.

Students in the third year of their studies seemed highly positive about the incorporation of education for sustainability into all sectors of education with fair degree of conformity between the three groups of students. Students also emphasised that the assignment scenario not only gave them prospects to design sustainable and creative ideas related to their specialisations but opportunities to improve the future.

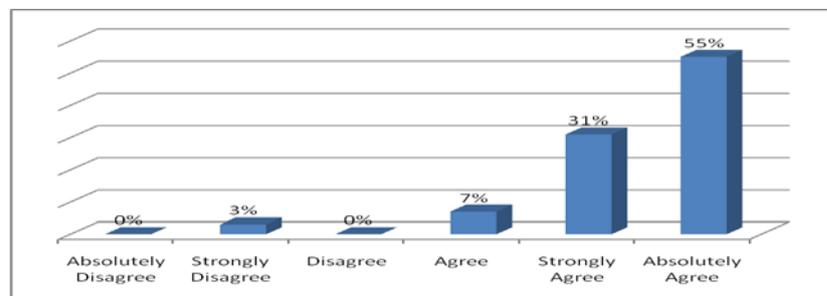
It'll certainly improve the future since the current methods and materials are running out.

Yes, because trade study is the way to create new products so it's good to relate it with sustainability.

If current graduates value sustainability and recognise its importance in all levels of education then it is apparent that they will be able to regenerate society and the overall community.

Majority of the respondents agreed that sustainability was an important part of the future and needed to be emphasised to a greater extent in education. This response was generated upon enquiry of students' perception about the importance of sustainability in the present and the future. They were given six options to choose from which are presented in figure 3.1.2.

Figure 3.1.2. Students' opinion on sustainability being an important part our future.



This positive attitude of students is an encouraging outcome for education for sustainability because students are the future and if education is able to transform these graduates into sustainable citizens then a sustainable world will be achievable (New Zealand Parliamentary Commissioner for the Environment, 2004).

4 FUTURE COMMUNITY SHAPER'S

The findings demonstrate that educating the current student generation is essential for manoeuvring the community towards sustainable development. Education that can empower learners to contribute towards community regeneration should be truly transformational. For sustainability to be instilled deeply into learner's consciousness current educational systems should be designed to gear lifelong learning and educational methods that encourage revolutionary thinking. It is evident through this research that educational methods such as project based or problem based learning and collaborative group projects may play a crucial role in transforming students thinking. For a sustainable community the community shapers, our students, need to be educated through methods that encourage reformation in thinking.

For community regeneration the harnessing of the social and human capital is essential and education for sustainability (EfS) acts as the binding force that can keep everyone working together to promote the development of sustainable communities.

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