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Contemporary Research Topics

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Sustainable Practice

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Special Issue: Sustainable Practice

This issue of *Scope: Contemporary Research Topics (Learning and Teaching)* takes the theme of "Sustainable Practice". It aims to engage discussion on contemporary research in the field of sustainable practice (including resilience, sustainability science etc). It is concerned with views and critical debates surrounding issues of practice, theory, history and their relationships as manifested through the experiences of researchers and practitioners in sustainable practice. The focus of this issue will be "Transformation" where contributors will be encouraged to explore positive actions in the challenge of the required restorative socio-ecological transformation.

Submissions for Scope: Contemporary Research Topics (Teaching and Learning) are invited from academics, educators, professional practitioners, and industry. Submissions should be sent in hardcopy and electronic format by 30 April for review and potential inclusion in the annual issue to Samuel Mann (Editor) at Otago Polytechnic/Te Kura Matatini Ki Otago, Private Bag 1910, Dunedin, New Zealand and samuel.mann@op.ac.nz with a copy to scopedifference@op.ac.nz. Please consult the information for contributors below and hardcopy or online versions for examples. Peer review forms will be sent to all submitters in due course, with details concerning the possible reworking of documents where relevant. All submitters will be allowed up to two subsequent resubmissions of documents for peer approval. All final decisions concerning publication of submissions will reside with the Editors. Opinions published are those of the authors and not necessarily subscribed to by the Editors or Otago Polytechnic.

Formats include: Solutions; Feature articles; Transformations; Making a Difference; Sustainable Practice in History; Envision; and Reviews

In placing the emphasis on Solutions, Transformations and Making a Difference, we are deliberately taking a positive framing. We are looking for solutions that are seriously creative: they should be novel, perhaps even surprising, but also well-thought out and credible. We prefer solutions that take a whole-systems approach. What do we mean by that? A system can be a community, a corporation, a government, or even the entire global environment. If you want to solve a problem, you need to look at these systems in their entirety and at several, nested scales, from local to global. Rather than focusing on a single link, look at the whole chain. When you start looking at the world this way, it becomes clear: everything is connected. What are examples? A solution can be local, such as the development of a sustainable eco-village or eco-city. Or it can be grand and global, like the development of an atmospheric trust to cap and trade greenhouse gases.. It doesn't have to solve all problems, but it should recognize what problems it can solve, and what others it might cause. Solutions should address the institutional and cultural changes that may be required. We welcome concrete goals, but we won't shy away from efforts to think outside the system or transcend a paradigm. (this description is taken in part from the journal *Solutions*, with permission).

Feature Articles and Envision aim to immerse the reader in new points of view from practitioners and theorists who are working on bold approaches to sustainable practice These perspectives may take the form of personal accounts of frameworks of sustainable practice and could describe the context of approach, the genesis of the sustainable practice, challenges faced in implementing and completion of the sustainable practice framework, and a discussion of the overall success of the sustainable practice framework including an effort to explain how this particular framework could be applicable on a larger scale. Envision may also take the form of editorials, reports on successful or promising approaches, or visions of how the future of Sustainable Practice might look.

Other types of articles may also be considered, though it is recommended that authors first submit a brief proposal to scopedifference@op.ac.nz. All research published in *Scope: Learning & Teaching* must have been considered under appropriate ethical review processes.

Articles should be written in an engaging, literary style that is accessible to non-experts. Ideally, authors will begin by posing a series of intriguing questions, creating a pleasing narrative tension that pulls the reader along to the conclusion.

High standards of writing, proofreading and adherence to consistency through the Author (Date) referencing style are expected. A short biography of no more than 50 words; as well as title; details concerning institutional position and affiliation (where relevant);and contact information (postal, email and telephone number) should be provided on a cover sheet, with all such information withheld from the body of the submission. Low resolution images with full captions should be inserted into texts to indicate where they would be preferred; while high resolution images should be sent separately. Enquiries about future submission can be directed to scopedifference@op.ac.nz.

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CONTENTS

Feature Article

SUSTAINABLE COMMUNITY DEVELOPMENT: STUDENT NURSES MAKING A DIFFERENCE

Dr Jean Ross, Josie Crawley and Laurie Mahoney

ABSTRACT

The community is the centre of a population's health and wellbeing, providing the context for primary health nursing practice. For nurses to be effective in sustaining and improving a community's health it is imperative they practice within the principles of partnership with the community. The nurse's role in the promotion of health and the provision of acute, chronic and rehabilitative care enables communities to be as well as possible, use resources effectively and plan for future needs by working towards a sustainable model of care. As nurse educators in the School of Nursing, Otago Polytechnic, our role is to ensure that undergraduate nursing students are prepared to practice in the community and to provide a unique opportunity to experience working with a 'community as their client' rather than the traditional mode where the individual is their client. This paper addresses the issue of a lack of equity in access to appropriate health care in some communities, in particular rural areas, and provides a relational model that leads nursing students to practice in partnership with rural communities with the aim of improving and sustaining the health of that community. A solution focused approach by the authors evolved during 2015-2017 with the development of the Community Health Assessment Sustainable Education model and is discussed within this paper. The model is divided into five phases and provides a structure that guides the students through the process of community development. Students are allocated into a group of up to 20 and are aligned with a rural community to create a community profile. Smaller groups then identify key stakeholders and form partnerships with different community members. Students' consultation and ongoing partnership with relevant groups aims to identify health needs, with the purpose to improve the health status of the whole community. Examples from the students' practice are provided to illustrate the model in action.

INTRODUCTION

Community nurses have an opportunity to enhance health and develop the wellness of members of the community and of the community as a whole. Globally, community nurses' practice is underpinned by the principles of Primary Health Care (PHC) and in New Zealand the Primary Health Care Strategy (2001) and the 2016 New Zealand Health Strategy. This paper transcends the "norm" of the content taught nationally to student nurses in the PHC context which is normally in general practice or other nursing contexts where the nurse works with individual clients and or families/whanau. We offer an alternative approach to education which embraces a community assessment problem solving partnership approach to solve local solutions in a systematic way. This process transcends the paradigm of student nurse education promoting a dynamic educational/community development/partnership paradigm with particular emphasis on rurality and with a focus on making a difference.

Problems and solutions

Rural communities are not immune to experiencing health disparities similar to those at both national and international levels (Fernley, et al., 2016, Braveman, 2014; Smith, Humphreys & Wilson, 2008) and are often related

to limited access, affordability, acceptability, appropriateness and the availability of a varied supply and provision of care by an array of health professionals (Ministry of Health, 2016, 2002, 2001). In this paper we focus on the health disparities aligned with rural Otago and South Canterbury regions in which the authors are connected with the education and clinical supervision of third year nursing students in the Bachelor of Nursing (BN) programme. The educational component aligns with the School of Nursing's philosophy that the principles underpinning PHC are fundamental bases of nursing practice. These principles include partnership, community participation and health promotion and are captured as a component of the student nurses' clinical practice experience aligned with their PHC clinical placement.

Ethical approval for students to consult with community organisations including community gatekeepers under lecturer supervision has been granted from the Otago Polytechnic School of Nursing Ethics Committee. Likewise, consultation with local iwi representatives through an aligned process negotiated with the Kaitohutohu Office (Otago Polytechnic) ensures students conduct their research within the principles of the Treaty of Waitangi. This consultation process is built into the project phases, encouraging students to explore potential implications for Māori, as the research progresses.

Geographical location	Identified vulnerable group	Issues identified
Dunstan Basin	Seasonal Workers and tourists	Freedom campers' health issues.
Dunstan Basin	Lesbian, Gay, Bisexual & Transgender youth	Lesbian, Gay, Bisexual and Transgender (LGBT) youth wellbeing in rural communities.
Dunstan Basin	Older people/well elderly (65 years until supported living required)	Social isolation, No public transport, Distance to GP practice & limited access to health care.
Dunstan Basin	Youth	Lack of specialist mental health Services.
Lakes District	Single-parent families Low income individuals People living with disabilities Elderly	Isolation and lack of access to health care services.
Lakes District	People living with chronic conditions	Affordable healthcare for those living with chronic illnesses.
Lakes District	Pregnant women	Lack of maternity services in the area for the growing population's needs.
Lakes District	Temporary migrant workers	Sexual health services for migrant youth.
South Canterbury	Well elderly	Loneliness and lack of support.
South Canterbury	Youth	Low uptake of Human Papilloma Virus vaccination & impact of social media.
South Canterbury	Young families	Access to primary health services for families with young children.
South Canterbury	Migrant dairy farm workers	Health of migrant workers and access to health services.

Table 1. Vulnerable populations' health needs and identified issues. Source: Authors

During 2017, student groups completed four individual rural community clinical projects, in separate rural geographical regions of Otago and South Canterbury. Each student group identified a minimum of three to five health needs, totaling twelve health issues (Table 1) the aim of which was to improve the health status of the identified vulnerable groups.

BACKGROUND

At Otago Polytechnic, Dunedin, we mentor student nurses to partner with a community as their client rather than the traditional model of nursing practice which sees nurses working with an individual or client of a service. Students advocate for their clients' (community) expressed health needs by engaging with community resources and PHC practitioners to promote the health of the population they care for. They manage episodes of illness, disease and life challenges by researching and producing evidence based strategies that are then actioned by the community. The PHC Strategy (2001) was the initiative of the Labour government to promote and maintain heath of the population through District Health Boards (DHBs), Primary Health Organisations (PHOs) and rural communities in the form of Community Trusts to promote accessible, affordable, approachable, available and appropriate health care to the people enrolled in the PHOs. These fundamental principles (Ministry of Health, 2001) are further explored as essential for rural New Zealanders in the report *Implementing the Primary Health Care Strategy in Rural New Zealand* (Ministry of Health, 2002) and more recently the *New Zealand Health Strategy 2016* (Ministry of Health, 2016). Factors such as appropriate access and acknowledging social networks, which provide formal and informal rural care, becomes a focus of rural nursing practice (Hutchinson & East, 2017). Rural nursing practice requires nurses to offer a health service that is innovative and collaborative and essential for the successful delivery of health care. To achieve this success it is therefore imperative student nurses are immersed in community development to enable them to contribute to a solution focused and sustainable health care context through an appropriate educational framework.

Enabling educational processes through theoretical frameworks

The authors endorse the importance of access to clinical practice opportunities where student nurses build trust, respect, integrity and partnership with community members with the intention of improving opportunities for health. It is a requirement of Nursing Council of New Zealand (2007), the professional regularity body, that student nurses build competency through supervised clinical experience, practising in a professional and ethical manner, managing nursing care from an evidence base, initiating appropriate communication whilst embedded within an interdependent, inter-professional model of health care delivery. When an entire community is the client, student nurses require a model and tools in which to achieve change to improve health in a way that is meaningful and sustainable. Theoretical tools and models utilised to improve health must be flexible to explore individual community context and structured so students have a clear framework to follow and be embedded within ethical PHC principles.

Clinical placement experience provides student nurses with an opportunity to learn over a period of three to four weeks. Opportunities for meaningful PHC practice to assess a rural community as a client, and to identify and respond to health needs requires the creation of a platform that prepares students to integrate practical, ethical and research requirements, performed within an isolated professional landscape. Kolb's (1984) theory of experiential learning suggests when students participate in an experience (become immersed in clinical community projects) followed by intentionally thinking about the experience, they will transform the experience into knowledge. Students appreciate the reality of rural isolation and experience by physically visiting rural geographical locations, mapping resources, uncovering inequities and listening to stories of resilience that are unique to each community. Students' are active in their own learning, intentionally strengthening their professional competence through guided reflection and practice, applying theory and scaffolding frameworks to shape and extend their clinical practice and experience.

The platform for groups of students to achieve active learning in a rural setting must incorporate several frameworks. Arnett and Rifken (1995) of the World Health Organisation, produced guidelines for the rapid appraisal of health needs in low income or rural areas, and include eight steps for obtaining information from communities along with resources to assist with the process. The rapid appraisal method rests on three globally appropriate principles: collect only necessary and relevant data, adjust investigations to meet local context and conditions, and involve the community in defining the needs and seeking possible solutions (Arnett & Ritken, 1995). These principals apply to nursing students forming partnerships in the rural context.

Recognising communities often identifies their own health issues. Francis, Chapman, Hoare and Birks (2013) adapted Battye, Mitchell, Cronin, White and Thornber's model of environmental scanning to provide a framework for nurses, working to promote health with communities. Experienced community nurses are led through five phases to assess an environment, partnering with a community organisation to plan, act and evaluate for health promoting change based on the identified issue. Francis et al., (2013) rely on Anderson and McFarlane's (2008) Community-as-Partner framework to reproduce. the Community Assessment Wheel as a framework for the initial nurse-led environmental scan. The core of this framework places the people and their history as the central component of the identified community. Added to this core are eight circling sub-systems (physical environment, education, safety and transport, politics and government, health and social services, communication, economics and recreation). The nurse needs to partner with an identified community to complete the primary data assessment using this framework (Francis et al., 2013) supplemented by statistical demographic and secondary data including the consideration of Māori throughout all components, and the additional services that religious and non-government groups contribute also needs to be captured.

Health promotion itself is a complex concept. Students are introduced to the Ottawa Charter for Health Promotion (World Health Organisation, 1986), a global charter for action, which clarifies that the nurse health promoter has a role alongside the wider community to advocate, mediate and enable clients to increase their control over and improve their health (World Health Organization, 1986). The Charter provides five action strategies that, employed together, are most likely to envisage a health promotion change in a community, nation or the world. These strategies involve shaping legislation and organisations to promote healthy public policy, creating environments that are sustainable and support health, empowering communities to own and control health choices, providing personal and social development and reorienting health services to work together and come from an evidence base (WHO, 1986). This model provides focus in assessing a need and also a framework for potential strategies to alter health status.

Nursing students on clinical placement are required to work within the New Zealand Nursing Council code of ethics, professional guidelines and to consider the Treaty of Waitangi in their practice. In addition, these clinical projects meet the requirements for Otago Polytechnic Category B research, requiring ethical application and consideration of ethical issues, Kaitohutohu consultation, safety of students and supervision by research lecturers. Processes to manage these ethical considerations need to consider the short time frame (four weeks) and the underlying and unknown nature of the partnership process. Community needs are identified by the community and sustainable responses evolve through ongoing consultation, limited by time, the community context, resources and the boundaries of student practice.

The CHASE model

The Community Health Assessment Sustainable Education (CHASE) model provides a consolidated structure that immerses student nurses in community development and engages students to be active in their own learning in partnership with their group peers, community organisations and educational supervisors. This model guides students through ethical, cultural, professional and critical thinking, verbal and written communication and visual presentations. The CHASE model is introduced as a way to plan the project and set realistic goals, and consists of a pre orientation, an orientation and six phases. Two separate lines transgress throughout this model and represent the students (solid green line) and supervising lecturers' (dotted orange line) lines of responsibility as the project progresses (illustrated in Diagram 1).

CHASE Model

Diagram 1. Community Health Assessment Sustainable Education Model. Source: Authors.

Pre-orientation

The pre-orientation establishes a relationship between the supervising lecturers (represented as a single dotted orange line in Diagram 1) and the stakeholder responsible for the provision of health care from an identified geographical location. Reference is made to the ethical application approval from the Otago Polytechnic, School of Nursing Committee to proceed with the community project/s at the pre-orientation stage and throughout the whole of each project.

Orientation

An orientation to the PHC clinical placement sets the platform in which the CHASE model is built upon. The orientation provides the students (represented as the solid green line) with the opportunity to become acquainted with each other, the supervising lecturers and to the geographical location to which they have been assigned to conduct the community development project. The supervising lecturers intentionally facilitate the students to become autonomous, being clear that they will lead the project in phases two and three. This empowers the group to work together as a team and ensures the workload is evenly shared. To enable this to occur, each student is invited to share one attribute they bring to this clinical placement. Attributes can range from leadership skills, effective communication skills, being able to transport others and having good computer skills. As this exercise unfolds, the students are able to get to know one another and develop the group or team relationship. Getting to know each other is a critical aspect in developing effective teamwork and to understand and agree on a set list of core ground rules to which the group have an opportunity to discuss whether there is a need to add additional group ground rules. The aim of ground rules is to further enhance positive group dynamics and reduce group conflict. Students undertake a risk assessment prior to conducting the fieldwork and complete the appropriate personal contact details that are held by the supervisor.

Prior to the students commencing phase one, the student's meet with the designated community host (in the case of the community projects completed in 2017, this was the Southern District Health Board), to clarify the geographical boundaries and local contact personnel the students could potentially interview.

Phase One

Phase one commences with the planning stage to undertake the community assessment associated with the identified geographical location. The community assessment is guided by Anderson and McFarlane's Community-as-Partner Wheel (Anderson & McFarlane, 2008) which enhances the collecting of both secondary and primary data to identify the core of the community. Secondary data is gathered by accessing web sites such as Statistics New Zealand including the National Census demographic data, the local DHB and Primary Health Organisation (PHO), as well as availability and make up of local services aligned with the location. This information assists the students to generate a list of questions they wish to discuss with local gatekeepers and to acquaint themselves as to who is who in the community, and to set up meeting times either by phone, email or face to face to have their questions answered. The primary data and face-to-face meetings are gathered in the field when the students visit the location, and through negotiated communication channels. At all times the students' practice is guided by the professional attributes and code of conduct expected of all registered nurses and the ethical principles guiding all research.

The Kaitohutohu process, in addition to the research ethics, encourages students to work within the Treaty of Waitangi, the partnership further directs students' data collection to explore Māori within all categories of assessment. As data is gathered the community assessment including the community profile of the location are written up to form the draft report. Patterns or themes that equals potential vulnerable population groups and health needs related to demographic data, are identified and further discussed in phase two.

Phase Two

Phase two requires the students to prepare the draft written report for verbal and visual presentation in consultation with the supervising lecturers. It is in this phase that the students start to take more responsibility for the project (represented as the solid green line) and the supervising lecturers take less of a responsibility (represented as dotted orange). Presentation of analysis on the patterns and themes identified in phase one are provided to Kaitohutohu and host personnel associated with the DHB or community partner and supervising lecturers to discuss a way forward for the students to proceed. This presentation aims to further identify and clarify the health needs related to the vulnerable population groups which directs the students' on-going work. The host DHB personnel or community partner share additional identifiable community members contact details to aid in the progress of the students' consultation with community members. This is the time that the students divide into smaller groups and align their practice to either an identified health need or identified community as the students' progress into phase three of the CHASE model.

Phase Three

Students in phase three work in their smaller groups and progress their individual component of the wider project in consultation with their supervising lecturers. Additional consultation may occur with community members and Kaitohutohu specific to the students focus on an identified health need. The students undertake a detailed literature review referring to national health strategies and policies and relate these to the identified health need for example, limited access to health care. The students continue to build up an in-depth picture of the geographical location, the services available to the community in conjunction with the demographic make-up of the community. Further, students engage with the Ottawa Charter for Health (World Health Organization, 1986) to further guide the evidence-based development and resources in which to improve the health of the identified population/community. Examples of project outcomes were identified in Table 1. It is in phase three the students are leading the project as indicated by the solid green line in Diagram 1.

Phase Four

Students continue to work collaboratively and progress with their written report and to develop evidence-based resources that match the health need of the identified population group and community location in phase four. All resources and reports are perused by the supervising lecturing team to ensure appropriate standards are met, and are in alignment with Otago Polytechnic policies, for example, have appropriate signage and logos and are approved for publication and wider distribution to the community. This way the resources and reports have a continued life once they have been handed to the community, so the community can progress on with the information and sustainable health promoting resources. It is at this stage of the project the lines of responsibility are reversed between the students and supervising lecturers (represented by the solid green line and dotted orange lines crossing over to represent this change in Diagram 1).

Phase Five

Students' return as a united group in phase five and in so doing bring together the individual components of the project as a whole. This requires the students to present the final completed published written report, the health promotion resources and verbal/visual presentation to the host representatives of the DHB and community partners along with individuals that have been invited to the presentation and those who have requested a copy of the written report. Further reporting and the specific ethical questions in alignment with Māori is presented to Kaitohutohu. Phase five leads onto the evaluation of the project in phase six.

Phase Six

Evaluation and the impact that the health promotion resources have made to the identified community population in the geographical location is assessed by the supervising lecturer six-twelve months following the completion of student projects (represented by the single orange dotted line in Diagram 1). This information is in keeping with Otago Polytechnic solution and system focused approach to working in partnership with solving community problems.

DISCUSSION

Underpinning and supporting the CHASE model are the following concepts: sustainability, professionalism, evidence-based practice and ethical approval to guide the students in the community development process. By viewing population aggregates as a focus of health, identifying health needs, and through the innovative development of resources to meet the ongoing and changing population dynamic, students are able to help create and redefine 'health' from an illness focused approach to include one that incorporates sustainability and holism to reduce inequities for vulnerable population groups. Students have reported in course evaluations that the clinical placement and engagement with the project has transformed their way of viewing communities and being able to identify vulnerable populations in a unique way that will enable them to keep vulnerable groups at the forefront of their nursing practice by promoting health rather than illness.

When reviewing the research findings from the student reports (Table 1), it is clear that youth/young people (rangatahi) young families, tourists and migrants along with the elderly and socially isolated are the most vulnerable groups in these rural regions, which has also been noted as a problem by Adler, Mansi, Pandey and Stringer (2017). Further, the students have linked vulnerability to health needs and inequities in health care services.

Inequities and disparities in health care are well known concepts in the health literature. Health equity is the principle underlying a commitment to address the determinants of health, including social and economic determinants which affect disparities in health care and outcomes (Braveman, 2014). Social and economic disadvantages result in avoidable and chronic illness, disabilities and early death (Smith et al., 2008).

The New Zealand Government has attempted to address the inequities for Māori and Pacific people in New Zealand noted in the *New Zealand Health Strategy 2016* (Ministry of Health, 2016) because of the known differences and disparities of health outcomes for these population groups (Bhopal, 2006). However little is known about the health needs and outcomes for other vulnerable groups or population aggregates in New Zealand. Vulnerable groups have not been well described or identified, nor have the disparities in the rural areas been well defined. Vulnerable groups are defined as including:

> …women and girls; children; refugees; internally displaced workers; stateless persons; national minorities; indigenous people; migrant workers; disabled persons; elderly persons; Roma/Gypsy/Sinti, lesbian, gay and transgender people; and HIV-positive people and AIDS victim…

> (Adler, et al., 2017, p.5)

A good example of such vulnerable groups is identified in *The Rise of Temporary Migration in New Zealand and its Impact on the Labour Market* (McLeod & Mare, 2013), a report commissioned by the Ministry of Business Innovation and Employment that identified there has been a rise in temporary migrant workers living in New Zealand. Many of these migrants are not identified through Inland Revenue, Ministry of Social Development, Health and Education sectors (McLeod & Mare, 2013). This report claims that many workers particularly temporary migrants for example, on working holidays, are not captured in employment data, because they are transient or tourists without working visas, or family members supported by migrant employees. Further, there are a group of migrant workers who are employed in a 'hidden' or 'shadow' economy and therefore not paying tax (New Zealand Taxation. com, 2011). For these reasons, they are vulnerable and marginalized leading to health issues with limited access to health care. Otago is one of the largest geographic regions in New Zealand, yet it is not known how many migrant workers there are in the Otago and Southland regions, but given the amount of tourists and people on working and education visas in the Lakes District region alone (Price, 2016; Statistics NZ, 2014), indicates that the 2013 census figures do not adequately reflect the true population in the region in 2017. It is not difficult to assume that there are high numbers of migrant workers in the hospitality trade and the agricultural sector (both dairy and seasonal fruit industries) which employs a significant number of migrants. The 2013 census (Statistics NZ, 2013), records that the ethnic breakdown of minority groups living in New Zealand at that time comprised Asians 11.8% and Pacific Islanders 7.4%, and Middle Eastern, Latin American.

There has been discussion in the health sector regarding the unequal access to appropriate health care in rural areas (Fernley et al., 2016; Smith et al., 2008), yet no discussion was found on growing communities such as the regions situated within the Lakes District particularly those with a high number of migrants and their health needs. Given the complexity of global environmental change and the prediction that this will impact on population health, nurses need to be responsive, knowledgeable and prepared to assess a community and to be resourceful and act on the impact of any change. It is imperative that nurses need to 'think globally' and 'act locally' (Rumsey, 2017, p. 385). Community nurses have an opportunity to enhance health and develop the wellness of members of the community and the community as a whole and in so doing, utilisation of the CHASE model can assist them in this endeavor.

CONCLUSION

Transformational change has been embedded in the educational activities leading to students demonstrating their innovative practice to improve community health. Third year nursing students have shown through the use of the CHASE model, that they are proficient at identifying groups in the population that are in more need of resources than others, and have embodied the sense or ability to incorporate a new system, different strategies and ways of thinking to achieve better health outcomes for vulnerable groups. The model has allowed them to partner with rural communities in a meaningful way, addressing health needs that the community has energy to sustain, in a way that is relevant to the community.

Further, impact assessment between the community as partner, the School of Nursing and Otago Polytechnic will at a later date demonstrate the influence the problem solving solutions generated by the students has had on improving the health of the population/s.

Sustainable Practice Solution Box

Problems:

- There is a lack of equity in access to appropriate health care in the community for different population groups that nurses practice with.

- As nurse educators, community frameworks available required adapting to meet New Zealand's community development needs in addition to academic requirements.

Solutions:

Develop a community project model for groups of Nursing Students that meets New Zealand unique community contexts.

Create a platform that prepares students to integrate practical, ethical and research requirements, performed within a professional landscape.

Nursing students use this model with a variety of communities to create a community profile, assess community health needs in partnership and respond to these needs with an evidence based resource or output.

Summary Box

The Community Health Assessment Educational (CHASE) model has evolved over a three year period to accommodate the changing student learning environment and context of community health needs. This relational model immerses nursing students in community development and engages students to be active in their own learning which is in partnership with their group peers, community organisations and educational supervisors. The model guides students through ethical thinking; and provides structure over a finite timespan, dividing a complex project into achievable stages.

The project requires students to critically profile a chosen community and identify health needs. To achieve health care improvement in a way that is sustainable to the population, students utilise the CHASE model which includes assessment frameworks, embedded within a health promotion philosophy. The evidence based outputs of the project are meaningful to the identified population's health, with the potential to make a difference as the community takes ownership and drives the project. Further analysis of the impact of these resources are currently being analysed.

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SUSTAINABLE COFFEE CUP DRIVE – UNPACKING AN INITIATIVE TOWARDS ELIMINATING DISPOSABLE COFFEE CUPS

Machiko Niimi and Tim Lynch

INTRODUCTION

In the recent years, a trend in the practice of take-away coffee has seen a global increase. As a result, international chains as well as privately owned cafes have become under a spotlight for the amount of disposable coffee cups that are given out, which mostly end up in the landfill. In the UK an estimated 2.5 billion disposable cups is used every year.[1] Similarly, in New Zealand, in 2011, 180 million coffee cups were distributed by Huhtamaki Group, a major manufacturer and distributor of disposable cups in New Zealand.[2] Various products, such as reuse cups and more environmentally friendly cups are being marketed to help mitigate the disposable cup waste. However, a café in Dunedin, New Zealand has been at a forefront of an unprecedented initiative. In 2016, Eden Café at the Otago Polytechnic tertiary institution initiated the Sustainable Coffee Cup Drive to cease the use of disposable cups in favour for other alternatives.

This paper examines the Sustainable Coffee Cup Drive in three parts; scoping research; insights from the research and describes the new system set up for Sustainable Coffee Cup Drive. Following this, the paper will use a practice theory approach to analyse the elements of coffee practice using a useful understanding suggested by Shove and Pantzer3. In practice theory, a focus is shifted away from individual's behaviour to assess social organisation of everyday activities. Examining coffee culture using this approach is helpful to analyse finer details associated with the rituals of takeaway coffee to highlight in what ways Eden Café's initiative has had an impact. Finally, this analysis suggests examining finer details of everyday coffee consumption patterns in consideration of further reducing coffee cup waste.

EDEN CAFÉ, SUSTAINABILITY SCOPING STAGE

In 2015 a scoping research project, incorporating observation of customers and discussions with stakeholders was lead by a small working group made up of the Eden Café Staff, and Otago Polytechnic staff with keen interest in researching sustainability strategies. Its aim:

1. develop a system to become a market leader in the café industry with respect to environmental and financial sustainability;

2. engage with the café customers and the Otago Polytechnic community to ensure development of a strategy that is supported by the community;

3. test the strategies towards reducing catering related waste and carbon emissions related to café operation. This was carried out with a view to implement a new system a wider catering services at Otago Polytechnic and beyond.

As a basis to develop a new strategy, the working group used open-ended conversations with customers; noted consumption patterns of the customers; assessed financial data; and explored national and international precedence in sustainable café operations.

INSIGHTS FROM EDEN CAFÉ, SUSTAINABLE SCOPING STAGE

A number of insights below were gained from the scoping phase.

1. The waste bin at the café often over flowed with disposable cups and had to be emptied more than once a day. This illustrated that, the disposable coffee cups were not being used for their intended function to help aid the "on the go" consumption. Instead, many of the customers were drinking their beverage on site.

2. Research into the production of the disposable cups uncovered vast carbon emission is associated with transport during production and distribution of disposable coffee cups for use in the New Zealand location. Huhtamaki Group which distributes most disposable cups in New Zealand sources raw timber materials from Russia. The timber is transported to Sweden to be pulped and transported to Auckland, New Zealand to be manufactured into disposable cups.[4] The cups are then transported, in this case another 1500 km to Dunedin, for use and despite the vast embodied energy, the cups are usually used for only a few minutes. Eliminating the use of these cups, in particular in our remote location, would make a meaningful impact on the environment.

3. Many customers voiced their interest in supporting the use of alternatives to disposable coffee cups. Some customers were already bringing reusable cups to the café to be filled up and to take back to their offices.

4. Many varieties of the disposable cups are made of cardboard fused with a plastic lining, which are difficult to separate and hence can not be recycled. On the other hand, some cafes are opting to give out cups made with biodegradable plastic lining. However, very few cups actually end up being recycled or composted. From our local perspective in Dunedin, the closest location for the biodegradable disposable cups to be recycled in large quantities through a commercial composting operation is 360km away in Christchurch. This brief assessment into the situation with disposable cups highlights some problems to ensure cups are disposed in ways suitable for various types of disposable cups.

5. The identification of a large network of local sources for food in order to reduce carbon emission related to transportation and to support the local economy.

EDEN CAFÉ, SUSTAINABLE COFFEE CUP DRIVE SYSTEM

The main findings from the scoping stage were instrumental for the working group to make the decision of eliminating the use of disposable cups from the beginning of 2016. This initiative set a precedence in café industries world wide and prompted national and international media interest. In the first year of this initiative Eden Café estimates to have eliminated 38000 cups from landfill. At the same time as ceasing to offer disposable coffee cups, the café also started offering a number of alternatives when customers wanted to take-away their drinks.

1. The café purchased ceramic coffee cups and began encouraging customers to consume coffee on site.

2. The café continued stocking reusable coffee cups and began actively encouraging customers to purchase them for takeaway coffee purchases.

3. Second hand cups were purchased from local charity stores and were offered for take-away purchases for free. Customers were asked to bring back these second hand cups for reuse. The intention here was that the second hand cups could be classified "carbon neutral" assuming that the number times cups must be used to offset its embodied energy would have been reached before the cups were donated to charity stores.

4. To encourage more on site consumption, Eden Café partnered with the Dunedin School of Art staff, students and friends to produce hand-made ceramic cups. Approximately 50 cups were made with materials funded by both the Dunedin School of Art and Otago Polytechnic Sustainability advisor. The ceramicists were not paid for their work and time, but the funding off set the cost of making the cups. Drinks served in the hand made cups offer element of surprise and delight and works as a talking point in particular as all the cups are uniquely different from each other.

Eliminating the use of disposable coffee cups is a difficult decision to make for any cafe. A foremost concern is turning down customers, resulting in negative economic impact for the business. However, café driven sustainability initiative such as this may have a far reaching environmental impact than asking individuals to act on their sustainability conscience. This article will now turn to theoretical underpinnings in order to analyse the potential impact of this initiative.

COMMON APPROACHES TO ADDRESS DISPOSABLE CUP WASTE

To address the issues around disposable coffee cups two common approaches are prevalent. This section will briefly introduce the two approaches to highlight the importance of Eden Café's initiative.

The first approach calls for cafes to dispense more environmentally friendly re-use cups. As briefly explained in Insights from Eden Café, Sustainable Scoping Stage section, examples of these cups include cups made out of biodegradable plastic lining, made with recycled materials and cup lid made of plastic that complies with local recycling systems. While these options help create a seemingly more sustainable option, a number of problems are raised to ensure the cups are actually composted or disposed as intended. Asking consumers to separate the cups alone raises a challenge. Various combinations of biodegradable and non biodegradable linings on the cup and lids being on the market, requires customers' understanding of the material to separate appropriately. In aligning with the convenience of the use of disposable cups, waste separation bins must be placed in convenient locations. However, as discussed previously, in cities that do not provide a large scale composting system for the biodegradable cups to be recycled as intended, these products could end up as mere "green wash." Despite the positive intentions, issues around disposal are associated with disposable cups.

Secondly, is a more complex behavioural change approach which puts the consumers responsible to take reusable cups to cafes. A classic approach to changing behaviour is to increase awareness and attitude towards sustainability issues, which would have a trickle down effect to changing behaviour. However, recent studies highlight the inconsistency between attitude and behaviour. Despite knowledge and pro-sustainability attitudes, behaviours in our daily lives often do not reflect our intentions.[5] Even consumers with positive attitudes towards re-use coffee cups can find themselves at at a café for an unintended purchase and not having brought a reuse cup. Similarly, taking long showers or driving a short distance that can be travelled on foot are part of reality for many, even for those with pro-environmental attitude and intentions to use as few resources as possible.

Our previous observation at the Eden Café was consistent with the above research. Most customers of the café are tertiary education staff, students and visitors with a degree of exposure and knowledge about sustainability issues. However, until the initiative began many customers did not arrive at the café with re-use cups, despite the fact that they were on sale at the café and moreover, many staff were previously gifted free re-use cups from the New Zealand Tertiary Staff Union. Furthermore, the café had placed a large poster explaining the negative environmental impact of the disposable cups. This observation supports recent arguments by studies suggesting that additional measures must be taken above and beyond asking individuals to take responsibility.[6]

At the Eden Café, the initiative to cease dispensing disposable coffee cups helped to begin shifting the norms and patterns of coffee consumption. Next we turn to practice theory approach to understand the complex patterns surrounding coffee practice and how this understanding may help develop systems for more sustainable ways of consuming coffee.

COFFEE CONSUMPTION AS A SOCIAL PRACTICE

Recently, an increasing number of sustainability and resource management research projects are being carried out through the application of practice theory, or theories of practice from sociology. Practice theory approach emphasises the move away from studying individual attitudes and behaviours to investigation of social organisation of everyday practices.[7] Rather than isolating an individuals' behaviour, the social practice model "looks into the possibilities for designated groups of actors to reduce the overall environmental impact of their normal daily routines involving clothing, food, shelter, travel, sport and leisure."[8] These routine types of behaviour are analysed through a number of interconnected elements. While there are a number of approaches to mapping out elements of practice, Shove and Pantzar's[9] understanding of practices is a useful tool of analysis. In their study, Shove and Pantzar[10] take cues from Reckwitz[11] and Shatzki[12] to argue that ".. practices involve the active integration of materials, meanings and forms of competence."[13]

"Interogation of materials Materials"[14] involve elements that are equipment or products and include people involved in the practice. For example showering would include material elements such as a bathroom, shower head, as well as hair, body and bathing products.

"Symbolic Meanings and Images"[15] refer to elements of a practice that offer meaning to a practice, for example, a meaning around walking may be for health, getting fresh air or a social activity.

"Competence and Procedure"[16] is concerned with ways of carrying out a practice, knowledge and know-how. These procedures in social practice are shared by actors through education, media or by taking cues from each other. For example, elements of competence and procedure for the showering may involve knowledge such as which cleaning products to use and competence of how to turn on the shower. Frequency and length of showering may be a form of knowledge that is culturally shared in the way that showering every morning may be an accepted norm for one culture and not so in another.

COFFEE CONSUMPTION MEANINGS, COMPETENCE AND MATERIALS.

Coffee purchase does not occur in isolation from other activities or without meaning. Rather, a coffee purchase is intertwined in routine and habits of everyday life. Shove and Panzer's[17] above understanding was used as a model to explain the intricate elements surrounding coffee consuming practice.

Figure 1, highlights the elements that are connected to the everyday practice of coffee consumption. The materials concerned here list associated coffee products such as disposable and reusable coffee cups, coffee machines, variety of food on offer and the smell and sound that are strongly associated with a café coffee consumption. The loud noise, the intense smell of coffee and the hustle and bustle is synonymous with cafe environment is difficult to replicate at home or a work office.

Symbolic meanings and image uncover perhaps some more recent meanings connected with café and takeaway coffee practice. Takeaway coffee projects broader nuanced meanings than simply that of convenience. Along with the newly formed ideas around "good coffee" as opposed to "bad coffee", takeaway coffees and walking carrying them, provides a way of asserting personal taste, or to follow cues within a social group.

Finally, the elements of the competence and procedure of coffee practice highlights the compounding of materials and symbolic meanings that has shifted everyday patterns and norms of how coffee consumption is performed. The disposable coffee cups enabling on-the-go consumption along with the meanings, have transformed the daily routines of many. Arriving at work early to buy coffee before starting work or walking to a café during morning tea break reflect a more recent and flexible allowance for time within a working day to accommodate a coffee purchase ritual. The meanings, materials and procedure indeed work together to shape how coffee drinking takes place during day to form a new habit or a norm.
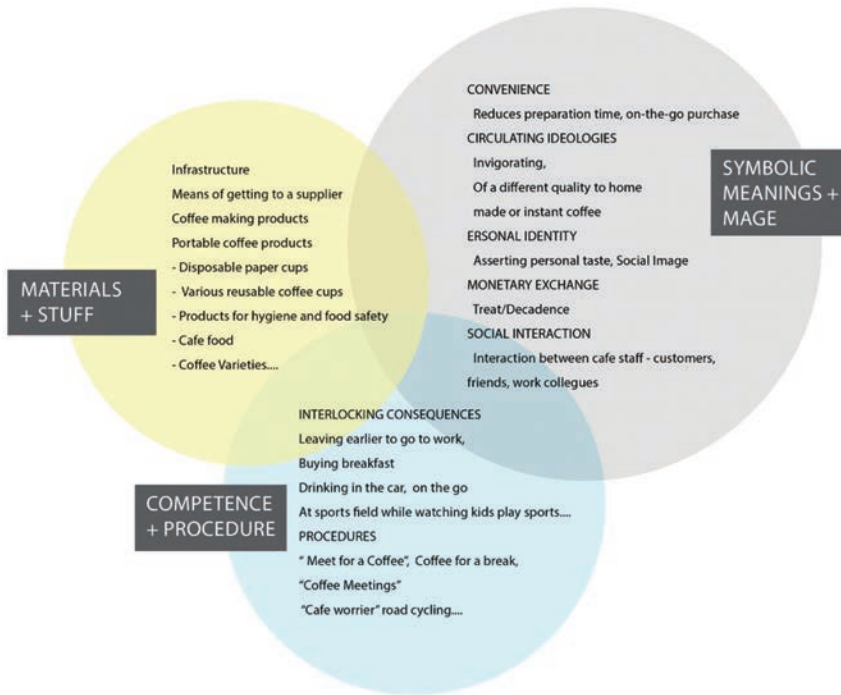
Figure 1. Meanings, materials and competence of takeaway coffee consumption.

In a recent observation, a caravan coffee store was providing hot beverages in disposable cups for parents watching their children's football games at a large football field on a Saturday morning. On this cold winters morning when the players breath are clearly visible in the fresh airs, hot beverage offers even more meanings to parents who are spectators, such as warming their hands and their body as well as passing time. This Saturday morning local scene alone hints a vast shift of meanings, norms, and expectations around the ways coffee is consumed.

CONCLUSION

While the disposable coffee cups have been the overall theme of this paper, the elements of meanings and competence associated with coffee consumption are key to understanding nuances of habits and rituals associated. Moreover, the elements of materials and meanings together introduce new procedures for 'doing coffee'.

The analysis through social practice approach is helpful in identifying that disposable cups as an element of material or stuff have helped construct new meanings and competence around 'on the go' coffee consumption. Caravan cafes offering only take-away coffees, drinking coffee during a commute or taking a café-bought coffee back to a work office, are new forms of consuming coffee that are enabled by disposable coffee cups. As a result, a growing dependence and expectation on this resource-intensive product has become a norm.

Coming back to Eden Café's initiative, eliminating the disposable coffee cups is no doubt acting as a catalyst for forming new expectations, norms and meanings around 'doing coffee'. On one hand this initiative sheds light on the environmental issues surrounding disposable cups to their customers. On the other hand, it shifts the expectations of customers regardless of varying attitude towards environment and the waste. As a response to the initiative,

Café staff are noticing that more customers are sitting down at the café or bringing reusable cups. Not having the option to use a disposable cup may also lead to conversations such as "...I'm just going back up to the office to get a reusable cup", "shall we just sit down here?" or "Have you got your cup?" to be an accepted and necessary norm for utilising the café.

The significance of this initiative is also in the additional approaches taken to enhance the 'eating in' experience, in particular providing handmade coffee cups from the art school students and friends from the same institution. Café staff mentioned that the handmade cups create a talking point between café staff and their customers. Incidentally the environment in which the café operates have recently renovated to become a 'Hub' and is acting a busy social space where people are having meetings, lunches and working away from their offices. This newly created environment may be a contributor to more of the cafe customers dining-in rather than taking away.

Here it must be mentioned that, prior to the initiative, Eden Café used disposable cups as a default option and did not offer ceramic cups. While their swift move away from the disposable cups is to be commended, using combination of washable cups and disposable cups would have help them run a more environmentally sustainable practice from the beginning. However, using disposable cups as a default or the only option is an operation seen often in cafes locally and nationally. In particular, cafes with limited spaces, such as caravan cafes and small 'hole in the wall' cafes would be difficult to cease using the disposable cups because of the lack of space to store and wash ceramic cups.

This makes us comes back to the reality that eliminating disposable coffee cups may have been a distinct possibility for the Eden Café located within educational organisation, with a community not only aware of sustainability issues but is reinforced as an institutional agenda.

It is no doubt that eliminating the use of disposable cups from an operation is a large financial risk for commercial cafes. However, Eden Café's precedent is a key to breaking the current norms around 'doing coffee' to build a new sets of norms in nuanced ways that are incrementally making positive changes towards environmental sustainability. In addition, the way in which the Eden Café not only ceased the use of disposable coffee cups, but also offered other alternatives allow customers to still make their decision to enjoy takeaway coffee and purchase from the café. The various alternative offerings are a key to this initiative's success. Therefore Cafes taking the initiative to make reusable coffee cups for sale as its only sustainability initiative will have small effect to shifting customers' behaviour, instead a number of alternatives to be offered as a part of the system are necessary.

FUTURE SCOPE

Further research in regard to the responses from the customers of this café will enrich this study. Currently, data gathering is in progress from customers of Eden Café to gauge how they have responded and accommodated the changes driven by the Sustainable Coffee Cup Drive initiative. Analysis of the customers' response along with more recent financial data of the café will enable us to compile a more comprehensive summary of this initiative. The summary will help develop a set of recommendations to interested parties, such as external café operations, city council bodies and various groups with interest in food waste minimisation.

The working group responsible for this project are also currently scoping further areas of improvement to the sustainability of its café operation. These include, reducing the use of meat ingredients to decrease the food production related carbon footprint, and sourcing locally grown ingredients to implement further strategies towards making a positive shift for the environment.

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Making a Difference

100 CUPS BEFORE LUNCHTIME[1]

Rob Cloughley

Figure 1. Tina Grubba throwing during the coffe cup blitz.

As a response to the call for non-disposable cups at the Eden Café, the Dunedin School of Art Ceramics Studio held a coffee cup blitz with the goal of creating 100 ceramic coffee cups to be used at Otago Polytechnic's Cafe.

Takeaway cups have become ingrained in our coffee culture. The blitz was a way for staff and students to work together to find a practical solution to the Eden Café problem and to gift the Otago Polytechnic with some beautiful "artisanal" tableware that can be used and appreciated by all Polytech staff every day. The ceramics studio was a buzz on the weekend of 30 June 2016 with current students, recent graduates and staff working together to create the ceramic coffee cups as an alternative to serving coffee in paper takeaway cups.

Staff and students are very concerned about the human impacts on the local environment and are constantly working together to find ways to decrease our ecological footprint, through practical means and by highlighting issues that need addressing through their art practices.

Rob Cloughley is the Diploma in Ceramic Art programme coordinator Ceramic Lecturer within the Dunedin School of Art. He has worked for Otago Polytechnic since 2002 and holds a Master of Fine Art. Robs practice is in Ceramic Sculpture and he teaches a wide variety of ceramicrelated topics.

Photos: Pam McKinlay.

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UNIVERSAL BASIC INCOME - HAS ITS TIME COME?

Scott Rickerby, Steve Henry and Alexa Forbes

EXECUTIVE SUMMARY

This report is intended for those who want to learn more about a Universal Basic Income (UBI) so that they may effectively promote and lobby for its implementation. It is based on a course of inquiry that Scott Rickerby undertook as part of a Graduate Diploma in Sustainable Practice. It includes references to thought leadership in the UBI argument, brings together some of the trials that have taken place, uses Max Neef's Human Needs Framework (Seed, n.d.) to map case-studies, and the Natural Step's Five Level Framework to set out a high level strategic plan for furthering the New Zealand discussion.

INTRODUCTION

The Problem

People in New Zealand are facing uncertain times with increasing income gaps, homelessness and other issues of poverty. The impacts of technology on the future of work, global economic and environmental shocks, a transition to a low energy and low carbon future, and the profit-driven agenda that continues to push for deregulation with the associated erosion of workers' rights is putting the 'squeeze' on ordinary citizens.

What is it

A Universal Basic Income (UBI) is a regular, modest payment to all citizens to use as they please. It is a guaranteed income paid to all members of a community set to enable a minimum livelihood while enabling participation in society. It's also known as:

- Citizens grant

- Guaranteed minimum income

- Basic wage

- Universal tax credit

- Social dividend

- Demogrant (wikipedia, 2015)

UBI trials have been held in India, Nambia, China and Canada either in the pure form as a straight UBI or with conditions attached or as top ups. Full reports on the success or otherwise of these programmes are not readily available and what is available, such as an analysis of the unconditional cash transfer programme in China (World Bank, n.d.), are inconclusive in terms of impacts on overall poverty, despite outlining some real benefits. Some more developed countries facing issues of intractable unemployment are now considering, or trialling, UBIs to deal with these issues. They include Finland, Greece and The Netherlands.

What we don't know

There have been no trials of a UBI in New Zealand and interest in the concept has been low. It has recently begun to enter the political discussion through the writing of Gareth Morgan in the 2017 NZ General election through the Opportunities Party, led by Gareth Morgan.

Build and sustain

Building the economy is important, but so is the ability for it to sustain itself. The Natural Step provides an internationally recognised best practice method of tackling sustainable development using a systems based approach. The Natural Step defines sustainability through the absence of abuse of four system conditions. (Naturalstep, n.d.). Key to the UBI discussion is the fourth system condition 'In a sustainable society, people are not subject to conditions that systemically undermine their capacity to meet their needs'.

The goal of a UBI is to provide a platform that is the basis for an economic system that removes barriers to people meeting their needs which in turn strengthens moves to a more sustainable world.

- How does a Universal Basic Income affect how people meet their needs?
- Can the concept of a Universal Basic Income gain traction if it is framed using a systems approach?

Literature review

The idea of a Universal basic income is not a new one, Gareth Morgan(2017), says 'In developing countries the UBI is old hat – it is readily accepted as an effective tool against poverty'. Many authors, over the centuries, have exposed the potential merits, benefits and reasons why a UBI should be adopted.

Thomas Paine

The writer of *Agrarian Justice*, published in 1797, proposed a once in a generation tax (inheritance tax) as payment for being able to own land that was previously in public hands. This would then fund a kick start payment when you reached 21, as well as an annual stipend if you made it to age 50 (Which happened to be the average life expectancy). It was based on the idea that property needed to provide for the basic needs of all people (wikipedia, 2015) and emphasises that all humanity has a right to meet their needs, as all land originally uncultivated belonged to us all.

Guy Standing

Is one of the most prominent promoters of a UBI, he currently works as an advisor to SEWA (Self-Employed Women's Association of India) (Standing, 2012) who ran a trial of a UBI by giving everyone a monthly payment to use as they please. The resulting data concluded that it worked well, as people made capital investments in themselves through better nutrition, health and medicine, education, and home improvements. People started business ventures, and others pooled their resources to buy assets that would benefit the community (Bhatt, 2014).

New Zealand commentators

Gareth Morgan's '*The Big Kahuna*' (Morgan , 2011a) and Perce Harpham's '*Reducing Inequality*' (Harpham, 2013) both advocate for a Universal Basic income, and also describe the means to pay for it. Morgan sees the right of everyone to participate and live with dignity, and a way to tidy up what he sees as the mess of our tax and benefit system. Harpham feels that a UBI could tackle New Zealand's growing inequality. Both propose a tax on wealth including the family home, in order to help finance the UBI. While a wealth tax may have merit, pairing it with a UBI could

create negative connotations that discourage support. In contrast Auckland Action Against Poverty promote a more generous UBI which has major purported advantages including freedom to pursue personal goals and regaining control over one's own time, and the freeing up of paid work for those that want and need it. They suggest a much broader tax base in which to fund it, including a more progressive Income Tax, an Inheritance Tax, a Financial Transaction Tax, and a Capital Gains Tax. The establishment of a capital fund, similar to the 'Cullen' super fund, could also be considered. (Auckland Action Against Poverty, 2015)

UBI TRIALS

India

This trial began in 2011 and was rolled out in 20 villages reaching more than 6000 people. It involved a small monthly payment into individual's bank accounts (which were set up if one did not exist) with children's money being given to their mother or designated guardian. The experiment ran for one year with data collected throughout. (SEWA Bharat, 2014)

Key findings were:

- Basic living conditions and sanitation improved

- There was increased access to drinking water

- Capital improvements were observed in areas such as energy, home ownership, and education

- Improved access to medicine and healthcare

- Benefits accrued exponentially as ensuing debt reduction delivered investment in productive work. (SEWA Bharat, 2014)

Namibia

This trial ran for two years starting in January 2008. It involved about 1000 residents from Otjivero-Omitara. N$100 (roughly US$12) was paid per person per month to residents registered as living in the town as of July 2007. Over the course of the study, significant migration to the area of people not receiving the payment meant some indicators such as income per capita dropped, so the results were analysed taking into account this migration. (Haarmann & Haarmann, 2014)

Key findings were:

- Increased economic activity

- Reduction in crime

- Improvements to education and child nutrition

- The community formed a support group to give advice to residents on how best to spend the grant.

- Reduced the dependency of women on men, and showed no evidence of increased spending on alcohol. (Haarmann & Haarmann, 2014)

- Two studies were completed, one at six months, and one after a year. No further studies were published and there is no public access to the project database, with the justification given being the confidentiality of the participants' personal information. (wikipedia, 2015)

Canada

This experiment was conducted in Manitoba, Canada from 1974 to 1979. It involved topping up resident's incomes to a minimum amount, called a guaranteed minimum income. The premise is similar to a basic income and has an end result very much the same. The trial was initially supposed to run for longer, but a cost blow out due to adverse economic conditions and political interference saw it cut short with no final analysis completed. A future study looked at the old data, mainly in regards to health outcomes. (Forget, 2011)

Key findings were:

- Lower hospital admissions

- Improved mental health

- An increase in students who continued through to their final year of high school

- Notably, improvements in health data, which had been worse than the comparison group, continued to match that of the comparison group even after the trial had ended (Forget, 2011)

POLITICAL FOOTBALL

These are just three of the trials that have been conducted around the idea that people should have access to a certain quantity of income regardless of their circumstances, in which to meet basic needs. The purpose of the studies was to quantify aggregate changes in outcomes and social behaviours, and if these changes are 'acceptable'. One such American study seemed to indicate higher divorce rates, and this saw a senator withdraw his initial support (Forget, 2011). Another classic example of undesirable change is lower labour force participation. The reduction in hours worked may be offset by an individual making an investment in education or caring for a family member, but this may not be recognised and the lower participation can be met with calls that a UBI makes people lazy. According to Mathew Schmid (n.d.), Huffpost Contributor, a UBI can also contribute to a more sustainable society as people "no longer stuck in the poverty trap can now make their community and environment a priority." He says that a "UBI respects human work and therefore income is not as a result or reward of your work but as the enablement of your work."

CONSIDERATIONS

The ability of people to meet their needs when given a UBI, should be a major focus of enquiry. How people behave when their needs are met should be the baseline, rather than the other way around. Looking at and comparing individual successes can tell us as much, if not more, about the benefits of a UBI, as a static aggregated percentage. Experiences of an individual can also be compared with others, across multiple studies, in different locations, and across time.

It is important in any discussion on transitioning to a more sustainable future that the ability for people to meet their needs is paramount. The ability of a UBI to help achieve this, needs to be addressed in the New Zealand political sphere.

Even within New Zealand, proponents of a UBI vary greatly in terms of the quantum, distribution, financing and even the language used to frame the debate. Those championing the UBI are disparate and uncoordinated with little agreement over a course of action.

Max-Neef

Manfred Max-Neef is a Chilean economist, who has a strong focus on third world development. He argues that human needs are few, finite, and classifiable. Not only that, but they are constant across human cultures and time. What changes is the way these needs are satisfied. Needs according to Max-Neef are interrelated and interactive, as opposed to hierarchical as suggested by Maslow. He classifies fundamental human needs as: subsistence, protection, affection, understanding, participation, recreation, creation, identity and freedom. Needs are also defined according to the existential categories of being, having, doing and interacting. This forms a Matrix of 36 cells in which examples of satisfiers can be filled in. (Seed, n.d.)

In the following table, we use a Max-Neef Needs Matrix to map personal examples and individual testimonials outlined within the literature. This made it possible to compare experiences of individuals from trials conducted in Namibia, India and Canada.

Fundamental Human Needs	Being (qualities)	Having (things)	Doing (actions)	Interacting (settings)
subsistence	physical and mental health	food, shelter, work	feed, clothe, rest, work	living environment, social setting
protection	care, adaptability, autonomy	social security, health systems, work	co-operate, plan, take care of, help	social environment, dwelling
affection	respect, sense of humour, generosity, sensuality	friendships, family, relationships with nature	share, take care of, make love, express emotions	privacy, intimate spaces of togetherness
understanding	critical capacity, curiosity, intuition	literature, teachers, policies, educational	analyse, study, meditate, investigate	schools, families, universities, communities,
participation	receptiveness, dedication, sense of humour	responsibilities, duties, work, rights	cooperate, dissent, express opinions	associations, parties, NOW*, neighbourhoods
leisure	imagination, tranquility, spontaneity	games, parties, peace of mind	day-dream, remember, relax, have fun	landscapes, intimate spaces, places to be alone
creation	imagination, boldness, inventiveness, curiosity	abilities, skills, work, techniques	invent, build, design, work, compose, interpret	spaces for expression, workshops, audiences
identity	sense of belonging, self-esteem, consistency	language, religions, work, customs, values, norms	get to know oneself, grow, commit oneself	places one belongs to, everyday settings
freedom	autonomy, passion, self-esteem, open-mindedness	equal rights	dissent, choose, run risks, develop awareness	anywhere

DISCOURSE ANALYSIS

A discourse analysis looks at the themes and ideas in the text of various thought leaders, and how these are presented. Several different articles and presentations that talked about a UBI were chosen and their contents analysed. These ranged from TED talks to Independent journalists.

- Ideas and themes mentioned were sorted into different categories
- Human rights: Fundamentals that an individual should be entitled to, no matter what
- Ideas or values that are not constant from person to person, across countries and time
- Bureaucratic: Ideas around tax and money
- Connotations: Words which can create strong emotive responses from people

Four pieces were chosen to demonstrate how a simple idea can get caught up in a whirlwind of words and finding the devil in the detail. They were

- A power point presentation supporting Gareth Morgan's Big Kahuna (Morgan, 2011b)

- A TEDx talk on why giving everyone free money is the best idea ever (Bregman, 2013)

- A clip from a European Advocacy group (Basic Income Europe, 2013)

- A short news piece featuring UBI and wages (Bhaatt, 2014)

Even this sample produced a wide range of themes and ideas. Each also generated numerous public comments and discussion, providing a great perspective to see what resonated with the audience and what did not.

OBJECTIVE	THEMES	BUREAUCRATIC	CONNOTATIONS
Human Rights	Redistribution	Capital tax	Revolution
Dignity	Inequality	High tax	Crisis
Unconditional	Progress	Single rate of tax	Utopia
Fairness	Social values	Simplify	Protest
Opportunity	Decency	Consumption tax	Austerity
		Inflation	Ambition
		transparent	

The idea that a Universal Basic Income is a possible way of protecting and enhancing human rights is common to most promoters. It is not hard to convince someone that they are entitled to certain basic standards, and that they shouldn't be disadvantaged by factors beyond their control.

That is where the minefield starts. Inequality is a good example. Most people can agree it exists, some will say it's a problem, but to others, reducing inequality is a way to reward lazy people at the expense of those who are hardworking, and the inference is you must be a communist for thinking that a UBI might be a good idea.

The TED talk presenter (Bregman, 2013) likens the adoption of a UBI to building a Utopia, his audience appears less than enthused. Gareth Morgan talks about a redistribution revolution, history tells us most revolutions achieve the opposite of what they intended, and usually involve massive social upheaval. Social media commenters generally liked the UBI idea but were suspicious, and some even openly hostile. Political decisions such as where the burden of taxation should fall, and what is decent, juxtaposed onto an argument of human rights led to some muddy the water.

FIVE LEVEL FRAMEWORK MAPPING

The Natural Step's Five Level Framework (n.d.), is an internationally recognised framework for strategic sustainable development. Below the framework is used to map the system, define success and strategise towards that success.

System

- A growing number of people are becoming interested in a Basic Income. They come from many walks of life and move in different circles. There is a core hub of activists clustered around different parts of the country, one of which is in Dunedin. An Incorporated group exists for the purposes of lobbying for a UBI. There is a comprehensive web site and Facebook page, which are linked into an international Basic Income lobby group.

Success

- The inclusion of a Universal Basic Income as part of the discussion on regenerating the economy for the new millennium.

- An intermediate vision of success would include a strong grassroots following, vibrant UBI Hubs around the country, and a united and coordinated national effort.

- National coordination around a united message that enables a full and informed discussion of the potential for a UBI in New Zealand.

Strategy

- Build grassroots support.

- Growing the Hubs around the country to inform and train those who want to promote a UBI in their own organisations and circles.

- Growing social media presence will help spread generate informed discussion. An interim figure of 500 page likes would give a strong base of support.

- Identify and train local people to become effective promoters and lobbyists for the UBI discussion in their organisations and communities.

- Coordinate nationally. It is important for everyone to be on the same page, and regular communication both strengthens personal relationships and strengthens the organisation as a whole, thus making it appear more professional and effective.

Action

- Attend community events - having a presence has proven to be an effective way of spreading the word and coordinating support.

- Public meetings with prominent promoters can bring together those who are curious about, or like the idea. Having a drawcard like Guy Standing to speak at an event has the potential to generate a lot of media interest.

- Letters to the editor and press releases have the potential to reach many people.

- Scheduling regular face-to-face Hub meetings, so that when people are ready to take the next step they can get involved and meet other supporters.

- Put together a toolkit that activists can use for education and training. This might include pamphlets, online resources, readings, clips and links, important contact details, and other useful paraphernalia.

Tools

- Tools help monitor the progress towards the vision. Key tools to use include:

    Social media participation- tracking 'likes'.

    Mailing lists-more names.

    Meeting attendance- turnout and frequency.

CONCLUSION

In addressing the challenges of the twenty first century a UBI could be considered as part of the discussion. The UBI international case studies show that a Universal Basic Income helps to remove barriers from people meeting their needs. There is no reason to suggest that a UBI would not produce similar, positive results in New Zealand. It would be an effective tool for policy makers to ensure people are better able to meet their needs. Supporters of a Basic Income passionately expose what they believe a UBI will achieve, but that vision is different for everyone and sometimes these ideals can be conflicting. This makes it easy for critics to sow seeds of doubt in otherwise loyal followers, be they US senators, or a retiree who worked all their life to pay a mortgage. Getting bogged down in details and rhetoric risks to prevent momentum on exploring what is possible with UBI. More research into the potential of UBI in NZ using a trail would be a positive step forward.

APPENDICES

Media Resources

Source	Key words, ideas, phrases
Big Kahuna presentation http://www.bigkahuna.org.nz/presentation.aspx	Participation, dignity, redistribution, speculation, Tax, paid work is decent, single tax rate, Capital tax on family home, Inequality,
Why we should give everyone a basic income | Rutger Bregman | TEDxMaastricht https://www.youtube.com/watch?v=aIL_Y9g7Tg0	Idea, Left-Right, Free money for everyone, Right, unconditionally, free money works, costs, utopia, expensive, progress, ambition
Should There Be a Universal Basic Income? https://www.youtube.com/watch?v=I32m1nGxVw4	Income inequality, inflation, protest, strikes, fairness
Basic Income, a new human right https://www.youtube.com/watch?v=zru79jcVTt4	Austerity, crisis, poor, accumulation, work, unemployment, right, volunteers, high tax, consumption, tax, self-finance, transparent

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DEVELOPMENT OF THE CENTRE FOR SUSTAINABLE PRACTICE AT OTAGO POLYTECHNIC

Steve Henry and Alexa Forbes

EXECUTIVE SUMMARY

The Centre was established in 2009 with the aim of being a centre of excellence around horticulture, viticulture and tourism. It was set up following a meeting with 35 stakeholders in Central Otago in 2007. The original working brief was to establish a centre that would support the development of authentic, sustainable tourism, worker housing efficiency, and also to recognise the importance of water and the need for water research. The centre of excellence didn't establish for several reasons; (Singularity Hub, n.d.). Otago Polytechnic decided it wanted to put its own house in order first, (United Nations, n.d.). The Otago Regional Council decided it would take on the required work around water (Ministry for the Environment, n.d.). Funding for the Sustainable Tourism in the Regions programme, which financed early work, was discontinued by the government. At this point, the vision of the Centre shifted. It came to envisage itself as an organisation that could mainstream sustainable practice by supporting people's work on personal or professional projects with a suite of well-facilitated frameworks and tools.

Despite taking a different direction from the one initially envisaged, demand for the skills contained within the Centre was evident and a programme portfolio was developed covering research, consultancy and qualifications. In 2016 there was another shift. Centre staff believed the world had moved on from sustainability as an aspirational goal and, while there were successes to celebrate, a Centre for Sustainable Practice by definition could not be in a leadership position – sustainability is simply the pivot point between degeneration and regeneration. From the Centre's perspective, regeneration rather than sustainability would be the leadership space.

By this time, the Centre had quietly built itself into a leadership position in transformational education, bridging gaps between online and contact learning, and between personal and professional spaces. Deep learning was happening and the Graduate Diploma programme had forged a strong community of people working on transformation of first themselves, then their organisations towards impacting whole systems. Centre work around collaboration has shown glimpses of a potential to be a New Zealand hub for solving complex problems by aligning interests and encouraging deep reflection. In Queenstown, graduate applied research learning has implemented a commercial biodiesel operation and facilitated community-led, future-focused solution planning.

The Centre has been largely invisible in its work to date both at Otago Polytechnic and in the wider community. The next 'evolution' desired is towards developing a deeper purpose that can attract others towards a transformation that will support regeneration of every aspect of our lives, society and environment - in line with the world's Global Grand Challenges as articulated by Singularity University and/or the United Nations Sustainable Development Goals. We would like the Centre to facilitate capacity building within the whole Otago Polytechnic system and its communities – modelling regenerative work and providing education for regenerative practitioners.

INTRODUCTION

New Zealand is at a crossroads, facing two major sources of disruption. 1. Core earners - dairy and tourism - rely on a clean, green image for continued success yet each have intensified beyond environmental and community capacity. Reports such as Pure Advantage's The Green Race (Pure Advantage, n.d.) outline the opportunity and the concern that risks are accelerating as opportunities are missed. 2. Rapid technological advancement is affecting many sectors, including education. As *Forbes* commentator Todd Hixon put it in 2014, "Education is Now Ground Zero for Disruption." (Forbes, n.d.)

At the Centre we have embraced this disruption and made fundamental shifts as we see learning move from fully campus based to include on-line offerings, and watch as the value of tertiary education moves from providing knowledge to providing experience. In response we have experimented with integrating on-line and experiential learning while maintaining academic standards within our graduate programme. This has largely been successful as evidenced by completion numbers and student satisfaction. The Centre is now operating almost entirely independent of campus-based delivery with staff and learner location becoming practically immaterial.

This success has been largely limited to a graduate programme (individuals) and we would like to extend this into our other areas of desired influence (organisational and systems). Our programmes in those areas have had some success, but not as much as we'd like so we have spent much of this year identifying what the issues have been and how we might rebuild these areas.

The glimpses of potential referred to above could be regarded as seeds of redevelopment ready to grow when resources are specifically allocated.

OUR ROLE/PURPOSE

Our purpose was **to mainstream sustainable practice**. We now find this statement restrictive and not coming from a position of leadership. We now see sustainability as the pivotal point between degenerating and regenerating, and we are interested in enabling the willing to work towards common, regenerative goals. Our new purpose needs to acknowledge our commitment to the transformational at all our touch points, our commitment to partnership and leadership, and our desire to bring these commitments to the discussion and eventual solution of wicked problems.

Individual Level
Designed to support deep, individual transformation

Organisational Level
Designed to support change in an organisation or business

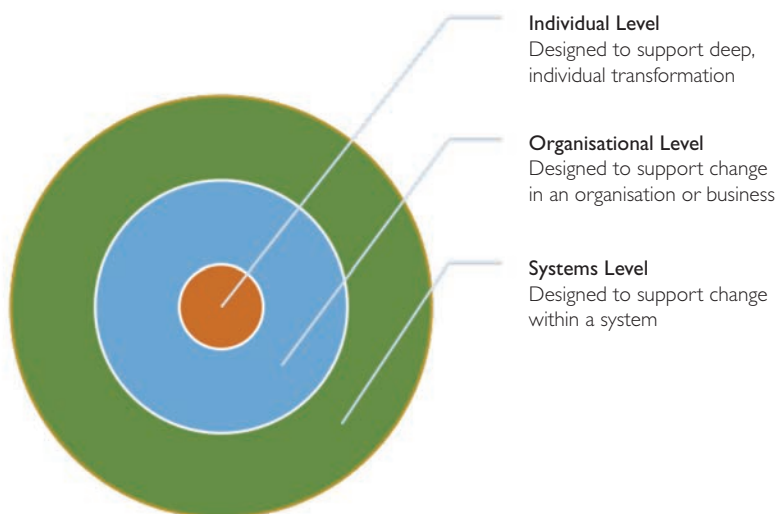**Systems Level**
Designed to support change within a system

Figure 1. programmes sought to work at individual and organisational level to eventu impact the systems level.

CENTRE HISTORY

In 2006 Steve Henry was appointed to focus on enabling sustainable business practices and supporting authentic tourism in Central Otago. This extended to opening the Centre for Sustainable Practice in 2009. Initiatives, some of which still operate, are outlined in the appendix. Otago Polytechnic simultaneously built its internal capability and embedded sustainable practice as a strategic platform.

Eventually, a pattern of programmes was established, including qualifications, to address sustainability at different levels (see nested circles in Figure 1).

Three levels of programmes were established in response to perceived demand. (See appendix 1 for details and case studies).

1. **Individual level.** A blended delivery graduate diploma designed to develop deep understanding of systems thinking and critical reflection in individuals.

2. **Organisational level.** Designed to impact organisations and businesses. Promoted as Adding Sustainable Value, this is a consultancy model business programme set up as a Level 5 staff training product to attract Government funding for qualifications. (Businesses were unwilling to pay the full cost of this product).

3. **Systems level.** This fee-for-service work includes the biodiesel project, Shaping Our Future community development initiative and research into NZ's Ecological Footprint.

KEY CENTRE ACHIEVEMENTS

Individual level

*   Graduate research work actively tied to partners at organisational and systems level to create a closed loop and to support hub development. Model in place and functional.

*   55 graduate completions including 9 international learners.

*   Model of online and block course delivery with learners and staff around the country is a proven success.

*   21 learners enrolled in Open Education Resource universitas (OERu) micro-course pilot.

Organisational level

*   115 businesses completed Adding Sustainable Value programme (Level 5).

*   Partnerships with Living Futures Institute and Ara to deliver the Creating Living Buildings short course.

Systems level

*   Publication of the Centre's first four micro-courses for the Open Education Resource universitia (OERu) in 2016.

*   Development of the community development programme Shaping Our Future. This programme is still in operation in Queenstown Lakes District Council and the model has been adopted at Northland District Council.

*   Research and consultancy in Environmental Footprinting, Localising Food and Biodiesel.

Our story shows how the Centre has been flexible, responsive and innovative since its inception. Much has been tried, most of which has enjoyed some measure of success, lessons have been learned and we're now ready for new steps in designing our future.

WHERE ARE WE NOW?

The Centre has one full-time employee, one part-time employee, two contractors and administration support.

The Centre has three areas of work as described in Fig.1 above. At the individual level, current Full Time Equivalent (FTE) programme is the Graduate Programmes in Sustainable Practice (Level 7). At the organisational level is the Adding Sustainable Value (Level 5) programme. At the systems level, we have expertise in research and in collaborative community development but are not currently active in this space apart from providing support as invited.

The Graduate Programme returns 12 Equivalent Full Time Students (EFTS) per annum and continues to grow slowly. It grows organically, without marketing support and we don't have our own resources to look for markets. We feel there is great opportunity in this programme, but if we are really going to change our world, this programme needs to integrate and feed the organisational and systems spaces.

Adding Sustainable Value is a 3-4 month programme for organisations, which has returned up to 18 EFTS per annum. Its EFTS have relied mostly on the networking of lead facilitator Simon Harvey. Otago Polytechnic lacks a corporate brand and the dedicated business development resource to market and sell such programmes. The issue with transformation in this sector is that business exists largely for profit. Business relies on systems that support externalisation of costs (relatively cheap energy, ability to freely pollute, use water, air, no need to pay living wages. A good example of this is the production of a big Mac. This from a recent NZ Landcare Trust article. "A Big Mac is currently priced at about 7 dollars but if all the costs of producing it were internalised it would probably cost 17 dollars" (Landcare New Zealand, n.d.). We would like to add value in this environment, to support businesses as they move away from cost externalisation. Currently, there's little perceived value in being 'sustainable' because of the ability to legally externalise environmental and social costs which means we can add little value through teaching how to reduce the costs which they don't pay for anyway. Most of the businesses completing this programme have either had benefit from saving, for example energy, or perceive a marketing benefit in being 'greener' or are driven to reduce their environmental or social impacts for personal reasons. We need a new way to engage and inspire organisations in this space and ideally this would include pressure to internalise costs. This pressure can come from legislation or consumer markets.

At the systems level, we have had some success in research and community development and we have good capacity and networks in these spaces. Shaping Our Future, Biodiesel project, NZ Footprinting Project, Otago Foodshed are examples. These have relied on graduate (or PhD in the case of NZ Footprint) researchers. These projects close a loop for us, people who have undergone the transformational change of the graduate programme get to work in these real projects that take that learning to the systems level. We need to structure and resource correctly to bring this area back to life.

THE FUTURE

How do we go exponential? How do we do what the tech industry does and continually double our impact? Imagine how amazing the world would be if we could double/double/double regenerative, transformational change? How do we know if we're already on the trajectory of exponential change? (It's flat for a very long time and known for its troughs of disappointment before the upwards curve and resulting chaos and amazement kicks in - think 3D printing – it's been around for 30 years, and is now exponential).

Our future as envisaged through today's eyes, is that someone in 2026 would describe our centre in the following ways.

- A virtual place and a network where people from all sectors collaborate to support ways of socialising benefits of private activity and ensuring recognition of all the costs of private activity towards a stronger, more resilient society that willingly addresses big issues.

- A place where people can come to learn, transform, regenerate and work on solving complex problems - particularly contributing to the solution of the Global Grand Challenges and the UN Sustainable Development Goals.

- Known for social and environmental outcomes including models to enable warm dry housing for all New Zealanders, tourism that improves lives, and a balance in the dairy sector that can restore waterways while adding long-term economic value to what, was once only a commodity.

- Successful in bringing together diverse stakeholders for new conversations about leveraging influence for good.

- A place that curates information and thinkers so learners can quickly find the best information available and have access to the best thinkers to support learner work.

- Successful in bringing education and experience together by powering projects with 10,000 hours of research per year from the undergraduate and graduate programmes of several tertiary institutions.

WHY DOES OUR CENTRE EXIST?

The Centre exists as Otago Polytechnic's response to the recognised need to support transition towards sustainability. As it has developed, the Centre has moved into a far more transformational space and is now focused on supporting individuals to become regenerative - for themselves, others and ecosystems.

We see ourselves as existing in the space between the corporate, government (executive) and Iwi acknowledgement that change and co-creation of the future is required before disruption negatively impacts large tracts of the population[9], and the practical 'how-to' gap of most individuals and organisations.

We would like our role as a hub to be centred around enabling transition and ensuring that a regenerative path is understood and chosen. We provide the education tools, research capability, connection, curation and support that could support an emerging willingness towards co-creation and mutualism.

OUR OFFERING

We offer the experience of participation as an essential part of the qualification or the consultancy. We promote understanding of issues and relationships to them, and support for transformation rather than the gaining of knowledge.

BARRIERS TO SUCCESS

Overall the Centre needs to examine the programmes and their utility. Does it want to be just about the Graduate Programme? No, it wants to feed into all parts of the system and develop all levels as part of a hub. Currently the Graduate Programme feeds the systems level and to a lesser degree the organisational level. We need ways for the organisational and systems level to similarly feed the individual level. We also desire a leadership position that has moved beyond sustainability into the regenerative space. We need a rebrand to express this, but need to have a strong understanding of our purpose first. We also require a system of marketing that we can access outside of our own internal resources.

Individual level

Difficult to place graduates in research (they manage it on their own, but ideally these would feed other levels.) Our Centre often has no input at all into the research host organisation. These organisations should become part of our Hub - we need ways to connect with them.

Organisational level

ASV programme needs redevelopment and rebrand. It has little to no marketing. It is consultancy dressed as education. Because of the consultancy approach, there is little connection to other levels so the critical reflection and sharing aspects of transformation are missing.

Systems level

Our work is proven, (Shaping Our Future) but we have no true sales or delivery mechanism. It requires a hub-style development that drives deep partnerships that are ongoing.

RECOMMENDATIONS

1. **Decide the Centre's place, purpose and value proposition.**

   - Otago Polytechnic leadership considers how a deeply transformational centre fits within the strategic directions of the wider organisation.

   - Work through a new purpose, set strategic goals and define a clear and easily understandable value proposition.

2. **Establish a development pathway that builds the three levels of the 'hub'.**

   - Individual   - Potential for new individual level programmes.

   - Organisational   - Needs review. Requires development and resource.

   - Systems   - Requires development and resource.

   - Change needs to be aligned with Otago Polytechnic's strategic goals and to build the three level hub (articulated above in Figure 1.) that creates a pathway for individual and organisations to contribute to real change.

3. **Hub rebrand.**

   - The Centre for Sustainable Practice has no true identity. It's not a school, it's not a business unit. So what is it? What should it be? What is its place within Otago Polytechnic?

4. **Actions and resources needed to create development pathway.**

   - Leadership time to establish identity and place for the Centre.

   - Resource for examining purpose and rebranding accordingly.

   - Redevelopment of, and marketing strategy for, organisational programme. ASV needs a new place to 'sit' - potentially as a Level 7 Certificate. It will require a full rebrand to target a changing market.

   - Time allocation and resources to build the offering and partnerships for systems level.

Appendix 1   Summary of Programmes 2009-16

Level	Outputs	Programme	Potential
System	Biodiesel at the pump	Queenstown Biodiesel facility (since 2010)	Wider roll out when cost effective
	Community led development	Shaping Our Future in Queenstown Lakes (since 2010)	Shaping Our Future model across NZ
	Ecological Footprint as a planning tool	NZ Footprint Project (2011-13)	Footprint calculation services for communities
		Bhutan Ecological Footprint (2014)	International Footprint calculation services
	Localising Food research	Otago Localising Food Project (2014-15)	More of it
Organisation	Strategic planning for sustainable practice in organisations	Adding Sustainable Value Regional Programmes Dunedin (2010) Queenstown (2010), Manawatu (since 2011), Auckland (since 2012), Waikato (since 2012), Bay of Plenty/ Rotorua (since 2013)	Every region in NZ then consider Australia Consultants use this programme to deliver change in their sector
	In house strategic planning for sustainable practice	Adding Sustainable Value Otago Polytechnic programme (since 2013) Auckland Transport (2016)	Provide in-house to larger organisations which have graduated from the regional programme
	Ecological Footprinting of organisations	Ecological Footprint of three of Otago Polytechnic schools (2014)	Footprint calculation services for organisations
Individual	Transformational Learning for People able to lead sustainable practice programmes	Graduate Diploma in Sustainable Practice (since 2011) Creating Living Buildings short course (since 2013) Open source Creating Sustainable Futures course (2016)	Delivery hubs throughout NZ and internationally

Appendix 2   Programme Value and Organisational partners 2006-16

Programme	Year began	Year ended	Income	Partners	Role the programme has played in the Centre
Sustainable Tourism in Regions	2008	2010	$100k	Ministry of Tourism, Destination Queenstown, Lake Wanaka Tourism	Got known and respected
Biodiesel establishment	2010	2011	$35k	Queenstown Lakes District Council, Dunedin City Council, ECCA	Got known and respected to deliver
Adding Sustainable Value	2010	-	18 EFTS per annum 2013-15	115 business clients, The Natural Step, Business NZ, local govts	Doorway into business, mainstream challenge
Graduate Diploma in Sustainable Practice	2011	-	12 EFTS per annum 2013-15

16 in 2016 | 66 Individuals | The think tank |
| Sustainable Practice 360 | 2011 | 2012 | 20k | The Sustainability Company | Helped define open source as a key value |
| Shaping Our Future | 2011 | 2015 | 200k | Queenstown Lakes District Council, Shaping Our Future Inc | Showed the value of applied research in innovating |
| NZ Footprint Project | 2011 | 2013 | $150k | Foundation for Science and Research technology, Victoria University

Auckland Council | Showed we can win large research grants |

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SUSTANIMAL: A REFLECTION ON COLLABORATION, VISUAL COMMUNICATION AND WASTE MANAGEMENT

Meg Brasell-Jones

Perhaps not since the interwar period of The Great Depression, has the word 'waste' been uttered so frequently in mainstream media. But rather than a focus on austerity and economic crisis, 'waste' as a solid, tangible thing is peppering our conversations and literally piling up around us. It is abundantly clear that humans have been very successful at producing an astounding array of waste. However, as evidenced by a surge of recent waste-related environmental conundrums, we are not so successful at managing it.

As a creative, I am interested in exploring the potential of communication design as a tool for sustainability. I share design writer Rick Poynor's (1999) view that the connection between design and sustainability is twofold. Firstly, design is a powerful tool to engage with people and positively alter their behaviour. Secondly, because design is most usually produced in multiples, the designer has a special responsibility to ensure that mass production is both warranted and measured. Furthermore, I strive to be optimistic about our future. In Tim Flannery's (2016) talk on climate change he stressed the importance of encouraging positive change, despite the seemingly insurmountable problems facing the environment today.
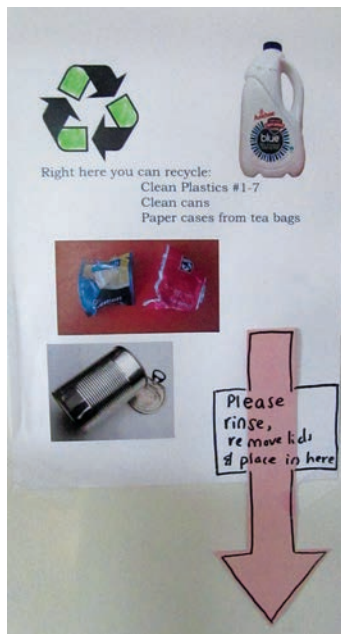

Figure 1. Temporary staffroom signage, 2014.

This article reflects on the experience of working collaboratively on a design solution around waste with sustainability at its core. The project, *Communicating a Vision of Sustainability* was developed and implemented by a research team at Otago Polytechnic (subsequently referred to as OP). Members of the team came from the same campus but from different areas. This formed a crucial knowledge pool; Chris Patchett had intimate knowledge of the waste created, managed and exported from OP. Tony Heptinstall had an informed understanding (supported by a waste audit) of the role of waste in his school (The Food Design Institute - subsequently referred to as FDI) and had developed an interest in changing behaviours. And as a communication designer (with a particular interest in sustainability), I became a third member of the team who could consider the others' research and articulate our joint understandings towards encouraging beneficial behaviour change.

The incentive to explore waste management behaviours originally stemmed from members of the research team being irked by witnessing our immediate (educated) colleagues ignoring or misunderstanding current waste management systems on campus. A further catalyst was the attempts by a newly appointed Sustainability Officer to respond to a call for instructional signage (see figure 1.). While lacking in visual literacy, these signs are early evidence of a hope for improved behaviours around waste.

In addition to recognising current patterns of waste management, an institutional obligation to move towards more sustainable practices on campus is an inherent part of the OP's Strategic Framework. The framework acts as a backbone to current and future thinking at OP, and includes the institution's intention "To engage in research and enterprise activities that develops the capabilities of our staff, students and graduates to work in a socially responsible way and sustainable way." As both students and staff, therefore, the research team is driven by this same commitment to sustainability.

The direction of this study was guided by the Framework for Strategic Sustainable Development (FSSD) practices, introduced to the team by the Otago Polytechnic's course in Sustainable Practice. This encouraged us to use The Natural Step strategic tools such as a 'sustainability funnel' and 'back-casting' to identify problems and search for compelling solutions (http://www.naturalstep.ca/). Many of us in positions at tertiary institutions have a desire to be more sustainable, but these specific tools created focus and a mapping out of concrete steps so that new knowledge could be implemented in a meaningful way.

With the FSSD in mind, the team elected to explore the practice of recycling on OP's campus to implement steps towards more effective waste management. In particular, the FDI was used as an area of the polytechnic to focus research on. While FDI users have access to multiple and widespread opportunities to recycle on campus, a recent *Otago Polytechnic Cookery Facility (Manaaki): Solid Waste Audit* prepared for the institution claimed that "approximately 75% of the material in the landfill skip could be composted or recycled" and that "significant opportunities to reduce waste to plore strategies to improve waste management, but it also worked to gain an understanding of waste volume (between 20-30 tonnes of waste, for example, is being produced from Manaaki each year (Waste Watchers 2015, 5)), and to identify specific issues and recommendations related to its management.

Prior the 2015 waste audit, the FDI had adopted various systems to move towards a sustainably operating, zero-waste department. Auditing and our research team's own observation, however, showed that these systems were not well designed or communicated, resulting in misinterpretation and a paucity of awareness around the institute's desire to operate more sustainably. The research team therefore, aimed to explore user awareness and behaviours to better understand potential barriers to participation. This led to some thinking around more successful approaches to communicate the systems and intentions through design intervention, to encourage more effective action.

The question, *how can the story of Food Design Institute's engagement in sustainability be effectively communicated to promote and encourage participation/support?* was developed from a review of the existing scenario and identification of drivers as mapped by the FDI's 'funnel' visualisation tool. The posing of this question was designed to specifically engage staff and students of the OP's FDI. This investigation also responds to one of the core values of the OP (Sustainability Kaitiakitaka); "to improve the environment through our operations" through seeking "new ideas and ways of operating" (2014, 15).

A mixed method approach was employed to investigate the research question. This allowed the research team to build a picture of current practices and attitudes to waste management in the FDI through triangulation, and then direct more effective action using targeted design. The methods employed included observation of current behaviours as well as a feed-backing system that allowed for individuals to share their experience of the system before and after our design intervention.

Although recycling is just one of a large number of environmental issues, it is one that is clearly connected to campus use – and despite confusion around what can be recycled, ignoring the potentials of recycling mean that mixed waste definitely ends up as landfill. In short, while the team did not necessarily believe that recycling is a long-term, sustainable solution, we did feel that it works to increase effective waste management. For this reason, we engaged in team research around users and generators of waste at OP. As a research objective then, the team hoped to identify how the current waste management systems in the FDI were being used and what improvement could be made to guide more effective usage.

During initial stages of research, two principal aspects of the current culture of waste management at FDI became apparent. Firstly, the institution has sought and provided options for waste management, including a system of bins for sorting rubbish. This system, however, is not always well understood by users, and very often misused.

Secondly, there is a throwaway culture in the workplace that is at odds with behaviours in a domestic environment, where users are held more accountable. There is less incentive for individuals to recycle, for example, when the institution foots the bill for waste disposal. Worse still, regardless of opportunities presented by the institution to effectively sort waste for disposal, users generally come with pre-existing habits that override these opportunities. For example, it is more 'convenient' to throw everything into the same receptacle. The inconvenience to waste management staff (and ultimately the community and environment) is, generally speaking, superseded by passé, throwaway habits. This egocentric culture is a barrier to changing behaviours towards more cooperative sustainable practices. Preferred behaviour involving waste disposal is not currently included in inductions for staff and students, nor is it valued in the same way, as say, health and safety.

Happily, here are a growing number of reports and case studies that outline various initiatives to encourage sustainability in the workplace and also in tertiary institutions (for example, Thomashow 2014, Wilhelm 2014, Barlett and Chase 2013). Locally, an OP colleague, recently explored design for sustainable behaviour, focusing on disposable coffee cup use for her Masters in Design research (Niimi, 2013). Niimi concluded from her research conducted at the Otago Farmers Market, that user attitudes and behaviours do not always align. In short, user intentions are not enough to ensure sustainable practices. Supportive measures and limitation of barriers (such as design intervention), however, can assist.

A 2016 workshop in the Design School at OP run by Sustainability Company director, Dr Barry Law, was useful in dissecting sustainable issues and re-invigorating personal action. Law made it clear that sustainable practice, while now in our (New Zealander's) collective consciousness, can't happen without behavioural change. A further overarching driver to engender sustainable practices through our research was adopted from Auckland University's Dr Niki Harré, who discusses the importance of being aware of our options, "recognising their dark side, and supporting each other in seeking ecologically and socially positive ways to achieved valued identities" (2011, 109). Both Harré (2015) and Law remind us that how we behave is more important than displaying our values on the wall and this is where institutions like FDI, will potentially have the most impact – through action.

Harré offers a collection of strategies for those on a journey towards sustainability to enable others to follow. One of her key strategies considers the psychological power of positivity. She asserts that positive ideas are more "uplifting, engaging, fun" and thereby are more attractive to potential followers. With this in mind, the research team developed an initial interface concept of a 'sustainamal' (waste monster) – an endearing creature that, rather like a Mogwai, had the potential to become a gremlin if simple rules weren't followed (Caudwell 2014).

To make use of the sustainamal as part of a behavior-changing strategy, a design brief was formed. The proposed design intervention was based around an effort to produce directive, yet compelling infographics to call users to action and hopefully improve engagement in the waste management process. This intention responds to OP's pledge towards sustainable practice, in which we as staff are "charged with ensuring our students understand and support our vision …" (2009, 17). The research team entrusted the negotiated design brief for trial infographics to a third-year visual communication design student, Timothy Boylson-Doyle. Student engagement again allowed for a richer collaboration between different areas of OP. Boylson-Doyle was asked to essentially design with his own demographic in mind, as a representative of the student population at OP.

Boylson-Doyle's outcomes were based around three, visually connected elements (see figure 2). First, a family of characters was designed to carry a playful but serious message. It was hoped these would provide a certain emotional connection with the users. The 'sustainamals' were given names, such as *Paper Paige*, and a set of individual characteristics. *Metal Morgan*, for example, has metal piercings and wears a black heavy metal-type jacket. While 'friendly' features were included, such as big eyes, floppy ears and human clothing, the designer was encouraged to work with the concept they were also need to have a certain 'bite' - hence the sharp teeth. The message here, is that the sustainamals encourage appropriate behaviours, but also communicate that failure to manage waste effectively hurts us all. *Laurence Landfill*, has been designed to be the most undesirable creature – to reflect a poor choice. He is seated, downcast and rough-looking in character.

As well as appearing individually, characters are paired up in accompanying graphics. These pairs illustrate to the user that certain types of waste need to be separated more specifically, for effective recycling. *Metal Morgan*, for example, takes the metal bottle top, as *Glass Gretta* takes the glass bottle. It was hoped that as well as instructional, these characters would help reference the journey towards zero waste, back to the users.

The second aspect of the infographics was to create a more comprehensive series of bin labels to aid separation. The bin's original single icon, to direct decision-making, is increased to three and is reinforced with text. One development of this series of icons, was to consider the *type* of waste coming out of The FDI and to focus images on relevant containers and food waste used by staff and students in their specific environment. For example, canned food tins were

Figure 2. Waste management graphics designed by Timothy Boylson-Doyle, 2015 courtesy of T. Boylson-Doyle.

used instead of beer cans, often seen on street recycling receptacles. A further development of this concept, was to include what *not* to put in, for example, broken glass. As identified by the Waste Watchers Audit, certain food waste cannot be placed into worm farm receptacle, so new categories were also made for these types of waste.

Thirdly, as well as ensuring that "there is signage on all bins", one of the recommendations from the Waste Audit was to "make sure all bins have standard signage and colours" as "good signage is effective in communicating information to the user" (2015, 34). Colour, therefore, was a key consideration for the design of the A0-sized super graphic as an indicator of different types of waste and their appropriate receptacles. One icon is used for each type of waste on the super graphic, to visually link to those used on individual bins. This is also visually-arresting through its large-scale format (see fig3).

The infographics went through several phases of design development before being produced as prototypes for installation. Signage was placed in the corridor of the Manaaki kitchens in the FDI, as a prominent viewing platform. Feedback received was positive and offered suggestions for improvement, at which point the study was concluded. Although the original design strategy developed by the research team could not be described as a complete solution to the waste management system at FDI, it was considered by the research team to be a step towards improved connections between problem and user. Crucially, the prototypes and associated testing from the research contributed to an ongoing discussion and planning around effective waste management within the FDI. This was a positive step forward; from hand-drawn, ad hoc signage to developed prototypes informed by sustainability tools, research and professional knowledge. It allowed for an opportunity to improve and engage in, sustainable practices in the FDI. It also worked to increase visibility of waste management systems on campus as a whole and kick-start further development under OP's sustainability officer, Jen Rogers.

Rogers engaged with students and Innovation workSpace to further develop a signage system for waste-management. Innovation workSpace is an OP initiative that tackles a variety of design problems in collaboration with staff, students, professionals and recent communication design graduates. The current development in the student HUB on campus makes use of colour-coding and graphics to illustrate different types of waste, in a similar

Figure 3. Waste management graphics designed by Timothy Boylson-Doyle, 2015 courtesy of T. Boylson-Doyle.

Figure 4. Current trial waste management graphics designed by workSpace Design Studio October, 2016 in the OP HUB.

way to that produced in 2015 by Boylson-Doyle. While it does not make use of characters to tell and support a waste story (or include humour as our original project did), it has had the benefit of designer input to prepare prototypes (see fig. 4) and creates far clearer instruction than previous makeshift attempts. In particular, the graphics showing the range of waste should be helpful in assisting correct sorting by users. Ideally, considered visual communication design works to facilitate improved behaviour. And better waste management translates to a benefit for our shared environment and resource use.

I am encouraged by working for an institution that promotes sustainable practice as part of its strategic plan. This means that 'sustainability' as a concept, is increasingly part of everyday discussion around the workplace and learning environment. A number of initiatives (including qualifications in Sustainable Practice as undertaken by the research team) are offered through the institution each year, to engage users with sustainability and meet their own strategic goal "to continue to minimise our environmental impact and to encourage others to embrace sustainable practices" (https://www.op.ac.nz/about-us/sustainability-at-op/). Certainly, at this point in the journey towards sustainability, OP is on a clear path to reduce environmental impacts and there are indications that it will move towards more restorative practices in the near future. This is highlighted by a desire to replace the word 'sustainable' with 'regenerative', in discussions around policy development. As past audits have suggested, however, different schools within the department are at different stages of the sustainability journey and more restorative practices will be a major challenge for some. Usefully, it is not just OP leaders, but also teaching and management staff that are exhibiting interest in change. Increasing too, are the number of students who question the status quo and bring with them their own ideas and solutions. A progressive, "leading" (https://www.op.ac.nz/about-us/) tertiary institution, presumably, is an ideal place to engage with change.

In essence, our collaborative research, *Communicating a Vision of Sustainability*, allowed for an opportunity to improve and engage in, sustainable practices in the Food Design Institute, as a testing ground to develop a model for other departments at the Otago Polytechnic. The process of carrying out research using new tools was challenging at times, but also rewarding. It involved applying sustainable thinking to real life scenarios, with a collaborative approach. Knowledge was developed, shared and then considered as a possible visual communication solution for the benefit of others. It has also worked to increase visibility of existing waste management systems. The challenge now will be to continue the work that has been started and to share any successes with a wider audience. This step will help keep up the momentum of more effective waste management but also maintain conversations around zero waste and a journey towards regenerative practices. Waste is a dirty word - literally and figuratively. What our collective problem with waste boils down to, is *humans* and *change*. Changing human behaviour is not always easy but increasingly urgent (and indeed inevitable) if we are to take responsibility for the problems associated with waste.

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CREATING SOCIAL INFRASTRUCTURE FOR COMMUNITY LED DEVELOPMENT IN THE QUEENSTOWN LAKES DISTRICT

Steve Henry and Alexa Forbes

EXECUTIVE SUMMARY

A process of community engagement was established in the Queenstown Lakes Distict as essentially a student project for learners in the Graduate Programmes in Sustainable Practice. Programme manager Steve Henry was committed to learners working on real projects that would develop individual and collective capability within system constraints while building real transitions towards sustainability. Shaping Our Future emerged as a model that continues to improve seven years after co   nception and that has engaged community and agencies such as the local council and the national transport agency. Shaping Our Future still has connections with the Graduate Programme as students occasionally offer internship services, but it has been fully independent since 2013. Shaping Our Future today is a thriving incorporated society that offers real benefits to the communities of the Queenstown Lakes District through following a proven process of strategic sustainable development. There are 10 'live' forums considering an agenda ranging from the visioning of small communities through to energy use across the district, transportation issues and the district's economic futures (Shaping Our Future, n.d. c). Its processes have proved robust throughout many challenges and it has successfully maintained its 'arm's length' position from the local council while gaining trust within the community. The organisation is held in high regard by both the community and the agencies that serve it, as evidenced by report inclusions in planning processes, demand for 'forums' and attendance at events. Shaping Our Future wasn't invented in Queenstown, it's a model from Whistler, Canada, based on a model developed in Sweden, but its flexibility and robust processes mean it has relevance for any community anywhere that desires strong lines of communication between the community and its agencies.

HISTORY AND ESTABLISHMENT

In November 2010, Alexa Forbes and Steve Henry began conversations with newly elected Queenstown Lakes District Mayor, Vanessa Van Uden, about harnessing the wisdom of locals in decision-making. Vanessa had campaigned on questioning the quantum of ratepayer money spent on external consultants given those who lived locally had the knowledge and the passion to guide their own future.

Along with Senior Planner Scott Figenshow, Steve and Alexa proposed a methodology to develop a new community-led decision making process which defined the Council a partner, not the partner. This process was based on an example, Whistler community (Whistler Municipal Government n.d.) in West Canada, which faced growth and tourism challenges similar to Queenstown. Whistler had used the Natural Step's Framework for Strategic Sustainable Development (The Natural Step., n.d.) to guide its process and Steve, Vanessa, Scott and Alexa were keen to do the same. Queenstown already had a relationship with Whistler through a local developer, Alastair Porter, so it was a good fit for the town and relatively known.

The project was presented to the learners in Otago Polytechnic's Graduate Diploma in Sustainable Practice (Otago Polytechnic, n.d.) in 2011. Several of the learners picked up the challenge developed a process to bring the project

to life. The goal was to inspire future thinking conversations in the Queenstown Lakes District. Mayor Van Uden insisted the "S" word, (sustainability) was not to be used in the process, so the name *Shaping Our Future* was eventually assigned to the programme. A Mayoral Task Force was appointed and it endorsed a plan for public meetings in the district's 12 community centres. The meetings were facilitated and the goal was for each community to articulate its own high level vision of success. Funding was secured through the Council for professional facilitation and collation (Otago Daily Times, 2011).

On the back of a Council-led 2020 visioning process that had happened a decade earlier, the meetings were well received with more than 1000 people taking part. The 2020 process had influenced planning across the Lakes District and was well referenced in the District Plan and other plans and strategies. However, there was a feeling that this needed to be updated and the idea of a continuing, cyclic process that sat *outside* rather than *inside* the council, proved popular. The Queenstown Lakes District had enjoyed a long period of significant employment, visitor, and population growth that was now concerning to many residents. The growth was forecast to continue at an increasing pace, and each community worried about relentless, increasing pressure on infrastructure, environment, and community and how this might alter local ways of life. Shaping Our Future aimed to ensure community voices were heard and acted upon by local government and other agencies, and that the process would allow for continual updates. The methodology centred on the collaborative creation of long term community vision and a continually updating roadmap that could guide the current and future generations. The challenge for the process was that it needed to convince Council, and other agencies, that it was adequately robust and representative to be included as reference in local planning and strategy and therefore, acted upon.

This was addressed by setting up a steering group with governance experience and a commitment to using the Whistler-proven process to ensure authenticity and representation beyond that of any focus group or consultation process, facilitation that ensured inclusivity that could not be captured by interest groups and step-by-step process that ensured completion of projects.

By the end of 2012, Shaping Our Future was set up as an Incorporated Society, had an elected (by members) Steering Committee, a paid coordinator (Alexa Forbes, who had worked on setting up Shaping Our Future as part of her Graduate Diploma in Sustainable Practice) and an annual grant to consider at least one identified 'issue' each year.

The first forum, and testing ground for the process, was Events. There was some annual plan money tagged in the Queenstown Lakes District plan to look at how events in the district could be better coordinated and so less disruptive to the local community. Road closures, noise and congestion had started to seriously impact on local life with the success of events such as the NZ Golf Open at Arrowtown, the Queenstown Marathon and Warbirds Over Wanaka. The latter attracted over 100,000 people in a community that had (at the time) a population of just 7000. The Queenstown Lakes District Council had developed a strategy in 2006, but this hadn't solved the issues of a fragmented and rapidly growing industry. The first public forums were held in Queenstown and Wanaka with 65 and 130 people attending respectively. A combined Task Force produced a suite of recommendations, including the formation of an Events Office and the establishment of funding grants to enable the collaborative ownership of shared infrastructure such as stages and sound equipment (Shaping Our Future, 2012). The report was presented to the QLDC in 2012. The recommendations were accepted and the Shaping Our Future model considered viable. In 2016, as part of the cyclic re-visitation of forums, a second Events Forum was established (Shaping Our Future, 2012).

Since then, the following areas have been considered through this process; Economic Futures, Energy, Innovation, Wanaka Transport, Queenstown Transport, Upper Clutha Conservation, Arrowtown Community Visioning, Glenorchy Community Visioning. The forum documents now regularly inform the Queenstown Lakes District Council and other agencies such as New Zealand Transport Agency and Otago Regional Council. The Forum final documents form part of the body of evidence for several decision-making processes and the development

of strategic plans, many of which have since been actioned. Thousands of people have taken part and the process continues today without reliance on the individuals that began it. This is considered important by the authors because long-term sustainability requires such projects, particularly where volunteers are relied on, to be able to continue long after the founders have retired. Steve Henry regularly exhorts his students and colleagues to "design themselves out of the process" if they want their project to succeed.

THE PROCESS IN ACTION

Following the establishment and agreement of an overall district vision in 2012, a process for working through chosen issues was agreed and enshrined in the governance. This was a simple loop process (Shaping our Future, n.d. b) of public forum (meeting(s) and online feedback), volunteer task forces, strategy reports and recommendations (Shaping Our Future, n.d.). Of particular note is the upside down pyramid – this process begins with blue sky community thinking which 'turns on its head' the usual process of beginning with a council or consultant produced plan which is then offered to the community for feedback.

The process begins with the Steering Committee setting an agenda of issues to be considered based on agreed community priorities and invitations from the community to consider a particular issue (Shaping Our Future, n.d. a).

A professional facilitator independently facilitates the Public Forums. Other views are collected through on-line forums. Current challenges, key issues, ideal outcomes and potential solutions are identified at the public sessions. The format ensures the 'loudest' voice is not the only voice heard in our community (through a process of voting on which challenges, issues, outcomes and issues are most important). At the forum, a Volunteer Task Force is formed. A brief, terms of reference and a timeline of up to a year are negotiated between the Task Force and the Steering Group. The Task Force works with the forum information and further research, often with the help of experts, for example, an NZTA traffic engineer and QLDC transport manager were made available to provide technical information to the Transport Forum Task Force as required. The Task Force develops a strategy report that includes high level baseline analysis, long term vision and actions recommended to achieve the vision. The volunteers are community members dedicated to representing the widest possible range of views and achieving long-term goals. The taskforce presents its findings for feedback and ratification to the Second Public Forum (again, online views are accepted). The recommended actions are then presented to the relevant agencies by the Steering Group for consideration, further debate, and action.

The process followed at each stage is grounded in The Natural Step (TNS) Framework for Strategic Sustainable Development (FSSD). The way this is used is in the background so that the 'S' word doesn't offend! However, progress towards sustainability principles is maintained through using the process (Shaping Our Future, n.d. b). Inaugural Steering Group chair David Kennedy termed the approach, "sustainability by stealth" (Kennedy, 2017).

EVIDENCE OF THE VALUE OF THE PROCESS

Shaping Our Future has continued to gain strength and influence over the 7 years of its existence. It is valuable in providing a platform for community views, for balancing 'loud' voices and allowing for quieter ones to be heard, and for offering direction and informal consultation to local and national agencies. Task Force and Steering Group members are often regarded as sources of news and Shaping our Future events are considered newsworthy – this is evidence of a high degree of respect for the organisation.

The Queenstown Lakes District and other agencies seriously consider the finalised forum reports and these documents are often referenced within their planning processes. This is an important indication of the success of this project in influencing decision makers and the willingness of those agencies to consider well constructed community led projects.

The Shaping Our Future transport report was used as part of the programme assessment in the NZTA, Queenstown Lakes District Council and Otago Regional Council Queenstown Integrated Transport Strategy Programme Business Case (New Zealand Transport Agency, 2017).

Earlier in this same document, Shaping our Future is referenced as one of four documents to display alignment with the Queenstown Lakes District Council (New Zealand Transport Agency, 2017).

Another benefit links back to the original support from then QLDC Mayor, Vanessa van Uden whose desire was to see people around the table instead of in court.

"By getting people into a room and working out a way forward, we can stay out of court" (van Uden, 2017).

Alexa Forbes, summed up the benefit in a similar quote published in the *New Zealand Herald* in October 2013 "Argument is very expensive and agreement is cheap. Shaping our future is a process that looks for agreement" (*New Zealand Herald*, 2013).

An unexpected benefit of the process is beginning to emerge – that is the slow convergence of community and agency agenda. This is evidenced in consideration of the controversy around approaches to Queenstown's increasing congestion issues:

The transport forum meetings attracted record numbers of people bringing concerns ranging from long term land use, to congestion, to perceived incorrect siting of the new Kawarau Bridge. A large task force (15 people) was established. It included local Councillors (no voting rights, observers only), past Councillors, a roading engineer from a private company, representatives from two private bus operators, an NZTA representative (no voting rights observer only) and many others. Over the year of its work, the taskforce independently arrived at a set of recommendations (Shaping Our Future 2017) which dovetailed into the QLDC's own integrated transport strategy (New Zealand Transport Agency, 2017). Essentially, both parties had cross communication, access to the same materials and ended up coming to pretty much the same conclusions, without the community battles along the way. Essentially, the Shaping Our Future process had taken the community on journey that was parallel to the Council one. Each informed the other with truly collaborative recommendation outcomes that in other circumstances may have been unpalatable or unpopular.

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WHAT WILL IT TAKE FOR COMPUTING TO SAVE THE WORLD?

Samuel Mann, Lesley Smith, Phoebe Eden-Mann and Phil Osborne

SUMMARY

This paper describes the application of a transformation mindset to guide the development of Computing for Sustainability.

BACKGROUND

In this paper we describe the use of Mann *et al.*'s (2017) Transformation Mindset to a consideration of why computing has struggled to deliver substantial change in the overall project in achieving sustainability.

Myers and Nathan (2016) describe current attempts to address sustainability through computing as "impoverished", by which they mean that it "largely fail(s) to represent the complexities of, and in particular the plurality of perspectives on, sustainability" (p229). In a similar vein, Silberman *et al.* (2014) explored the "next steps" for sustainable human computer interaction (HCI) and found that "business as usual (is) not well positioned to contribute substantively to efforts to address the challenges of sustainability" (p66).

It is difficult to estimate the impact of computing actions towards sustainability. Hilty *et al.* (2017) points to a lack of a non-computing baseline. But is undeniable that computing has the promise of being a leverage discipline. The potential handprint of computing is far greater than its admittedly large and troubling footprint.

Berkhout and Hertin (2001) introduced the distinction among first-, second- and third-order effects of ICT, (1) "direct environmental effects of the production and use of ICTs", (2) indirect environmental impacts through the change of "production processes, products, and distribution systems", and (3) indirect environmental impacts "through impacts on life-styles and value systems" (2001).

Considering a limited set of Greenhouse gas emission abatement levers, Hilty *et al.* (2017) estimated the potential handprint being 2.6 times greater that the footprint. This handprint is largely attributed to 2nd order efficiencies which Berkhout and Hertin described as "largely positive through decoupling of economic growth and environmental damage"

- intelligent production processes
- intelligent design and operation of products
- reorganisation of supply chains and business organisation
- intelligent logistics and distribution
- process of e-materialisation
- networking effects facilitation of codified information

But, pointing to the productivity paradox, they are wary of being overly optimistic

- resource productivity gains are slow

- scope for e-materialisation may be limited

- incomplete substitutions

- interrelationship between the virtual and the material economy

Mann and Bates (in press) discuss how the promise of computing's potential positive impact has led to a vision of "apps that tell you how long you've been in the shower (that) are going to save the world". They ask ,"if it was going to save the world, how come the world's not saved yet?" and argue that "worse than being ineffective, the focus on computing supported efficiencies are actually doing us harm". They list eight reasons for this: appealing to the wrong value sets; green myths (or Geek Heresy); substitution; negative focus (rather than regenerative hope), context of sell more stuff; rebound; the nature of sustainability not being amenable to positivist intervention; and a weak understanding of sustainability (Krumdieck and Mann 2015, Hes and du Plessis 2014, Toyama and Mann, 2015). The last "weak sustainability" refers to the technical term - as opposed to Daly's strong sustainability, but also meaning limited understanding of sustainability. Computing seems to have gotten totally distracted by carbon, framing sustainability as only carbon efficiency for climate change through 1st and 2nd order efficiencies.

Climate change is indeed a defining issue of our age, but framing computing for sustainability primarily in that way ignores all the other important elements. How can computing help biodiversity loss, global inequities, or intergenerational inequities? These t hings are complex systems posing wicked problems with intergenerational timescales, so while we have an approach to computing for sustainability which is focusing primarily on simple, short term things that we know we can fix, we're not going to get there.

This should not come as a surprise though, Hilty *et al.* (2017) point out that their analysis of environmental impacts was limited to GHG emissions: "ICT also has other economic and social effects, which were not within the scope of this study. The climate change impact of ICT is one part of the picture and needs to be complemented by other perspectives". (p35)

It would be defeatist to think that a holistic sustainability is too hard to approach from a computing perspective, but rather, we argue that a different mindset might provide a way forward. In the following section we apply a Transformation Mindset (Mann *et al.* 2017) to help consider and progress the contribution of computing to a sustainable future.

TRANSFORMATION MINDSET

Mann *et al.* (2017) developed a Transformation Mindset as a means to guide practitioners in adopting being a sustainable practitioner as part of their professional framework of practice (Mann, 2011 p13).

Mann *et al.* (2017) defined the "Transformation Mindset as a way of thinking that leads to transformational acts resulting in socioecological restoration". This transformational focus came from Leach *et al.* (2012) who argued that "what is now needed is nothing short of major transformation – not only in our policies and technologies, but in our modes of innovation themselves – to enable us to navigate turbulence and meet Sustainable Development Goals".

While some avoid a problem formulation, preferring a positive framing of opportunities (Hes and Du Plessis 2014 - a baby is not a problem but something precious to be nurtured), the challenge posed by unsustainability can be usefully considered as a "wicked problem" (Morris and Martin, 2009). This means it involves complexity, uncertainty, multiple stakeholders and perspectives, competing values, lack of end points and ambiguous terminology. It means

dealing with a mess that is different from the problems for which our current tools and disciplines were designed. As individuals and disciplines , we are ill-equipped to cope with the messy complexity we now face. Adomssent *et al.* (2007) saw sustainable development from a holistic perspective; it can be understood simultaneously as a concept, a goal and as a process or strategy. The concept speaks to the reconciliation of social justice, ecological integrity, and the wellbeing of all living systems on the planet. The goal is to create an ecologically and socially just world within the means of nature without compromising future generations.

We posit that a sustainability-based transformation mindset may be beneficial on the following premise: Sustainability is the process or strategy of transformation toward a sustainable future, and the transformation mindset as providing a structuring for that and therefore for providing guidance for disciplines such as computing.

Mann *et al.* describe the sustainability-based transformation mindset (Figure 1) as follows:

> The mindset can be considered with a device recognisable to those familiar with software engineering's Agile Manifesto – a list of values and attributes arranged so that each is defined in part by an opposing value (Beck *et al.* 2001). The agile manifesto structure finishes with "that is, while we value the items on the right, we value those on the left more" (np). These things on the right then are not inherently wrong – we could find people attempting sustainability doing those things, but we argue that the things on the left are better. Hence, for example in The Transformation Mindset, Item 7, "values change over behaviour modification" can be read as 'we value things that modify behaviours, but a focus on values change (and hence behaviour) is stronger'. Most of these items also carry more than one message. Item 7, for example again, also speaks to the problem of change by appealing to inappropriate values such as promoting "green" actions because it is cheaper rather than because it is the right thing to do (otherwise, what happens when green turns out to be more expensive?).

If we wish to transform ourselves and society, we need to embrace

1. Socioecological restoration over economic justification

2. Transformative system change over small steps to keep business as usual

3. Holistic perspectives over narrow focus

4. Equity and diversity over homogeneity

5. Respectful, collaborative responsibility over selfish othering

6. Action in the face of fear over paralysis or wilful ignorance

7. Values change over behaviour modification

8. Empowering engagement over imposed solutions

9. Living positive futures over bleak predictions

10. Humility and desire to learn over fixed knowledge sets.
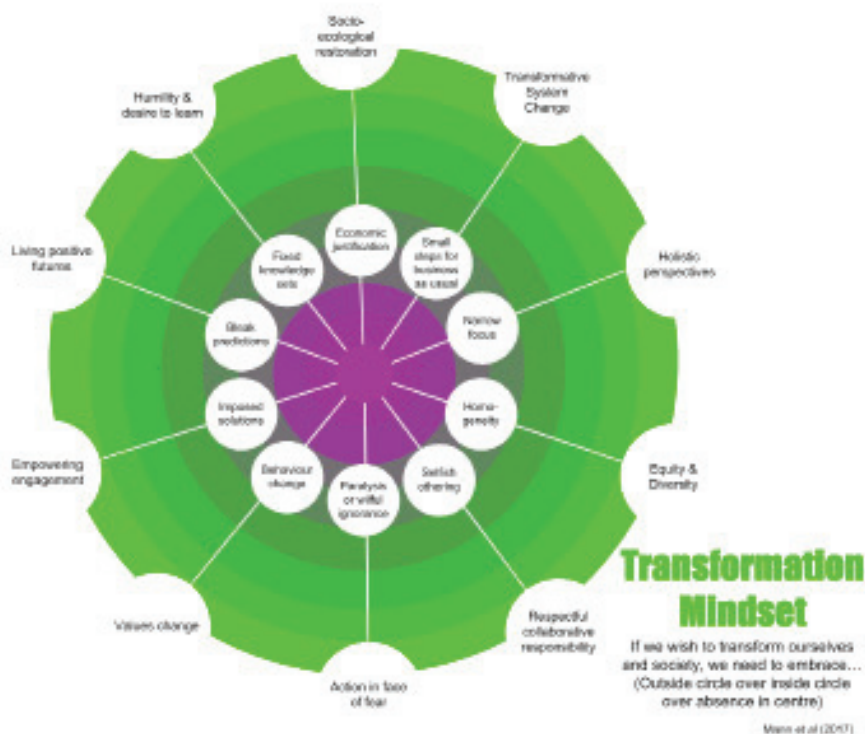
Figure 1: Transformation Mindset

Figure 2: Graphical version of the Transformation Mindset

While each item can be considered separately, they are not exclusive and tensions between the items provide much of the challenge. The elements of the Transformation Mindset are further explored in relation to computing in the sections below.

The Transformation Mindset can be used to consider different development initiatives. Figure 2 gives a graphical version of the Transformation Mindset in which the elements of the mindset can be positioned on the 10 axes. Note that in keeping with a mindset rather than a detailed set of metrics, the positioning on each axis is subjective. For each, the inner ring describes actions that usually align with a weak sustainability, and the outer ring a transformational approach. The centre of the image, inside the inner ring represents actions that could be considered unsustainable, or where that element is not addressed at all by the development. As the arrangement of the axes around the circle is arbitrary (clockwise from the top) no inference can be drawn from particular shapes on the diagram. Further, it would be inappropriate to attempt to calculate a total "score" - that is, you can't make up for not attempting socioecological transformation by maxing out equity or some other element.

As an example of the application of the Transformation Mindset, Figure 3 shows a business development to help homeowners manage smart home equipment, primarily solar panels (unpublished project). Again, as an actual development, the project scores better for "Action", on "Positive futures" for enabling homeowners to live more sustainably, and on "Transformative system change", but not so well in other areas. In diversity it performs poorly for being a one-size fits all, forcing homeowners to fit the system, rather than enabling everyday practice. The system is primarily marketed as saving money as a means to change behaviour so performs poorly on "Value change".

1. Socioecological restoration over economic justification

This item makes clear that the point of sustainability is socioecological restoration. Economic development or reasoning is not dismissed but should be seen as a means to achieve benefits in social, cultural and environmental aspects – a vehicle for sustainability, not a goal in itself (this aligns with Daly's Strong Sustainability, 1996).

The combined socioecological wording is a deliberate modification of Olsson *et al.*'s (2004) "social-ecological" to bring it in line with constructs such as "socioeconomic". It represents an acknowledgment that humankind and the environment are inseparably intertwined. Sustainability is not just about single factors such as efficiency gains, and the problem is not just about carbon or energy; the systems in question are as much social as they are biophysical.

The restoration element is both an acknowledgment of the current path of degradation and a commitment to repair, not just stabilise or maintain in a degraded state (Hes and du Plessis 2014).
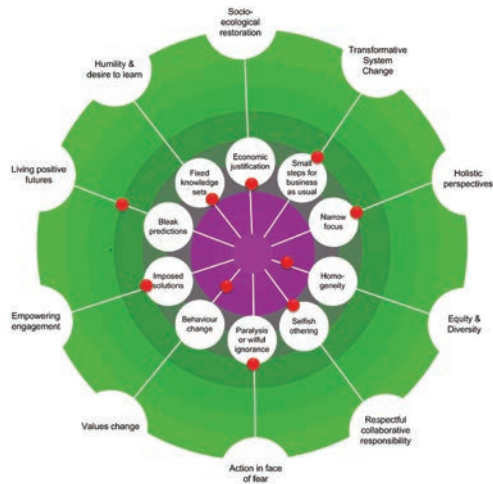

Figure 3: Smart home power management considered by Transformation Mindset

2. Transformative system change over small steps to keep business as usual

It is widely argued that making small improvements, while maintaining the status quo, is unlikely to result in required changes for a sustainable future (Placet *et al.*, 2005).

Transformation is used here to move the focus beyond the comfortable perception that global environmental challenges can be met through marginal lifestyle changes. Small changes are necessary but insufficient – we live at a time when we need urgent and ambitious changes (Thøgersen, 2009). Instead of solely working on small things and hoping that they add up to a change (themselves or with 'spill over'), we need to focus on things that multiply to create positive system change.

While looking for system changes, we need to be careful not to put too much reliance on "miracle cures". While this may seem to contradict the purpose of this paper, "What will it take for computing to save the world ?". The clue is, that computing is tool that facilitates and enables social change, rather than a technological saviour. Waiting for technology to deliver efficiency gains through behaviour change, or even not having to change behaviour, is what Krumdieck (2015) refers to as a green myth. It's the miracle just around the corner so we can carry on business as usual. Kentaro Toyama (2015) has a similar concept in his "geek heresy", that we think that throwing technology at problems is going to solve them, but his summary is technology exemplifies underlying human forces. If we are continuing to consume, and that's the primary human force, then throwing technology at it is not going to solve that problem.

Figure 3 shows the mindset applied to a product development intended to digitise a previously paper-based process - that of building consents processing within a local authority. This project had been described as meeting sustainability objectives. The project does not score highly on any of the Transformation Mindset elements. While it is doing something, it is narrowly focussed, not participatory and focusses on monetary benefits for action. While it may save some paper, this is substituted with IT equipment. The project made no attempt to address diversity (eg through language, disability accessibility) and by standardising process, inadvertently made it harder for non-standard community processes.
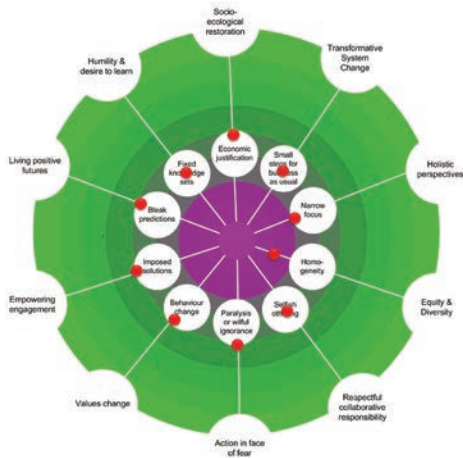
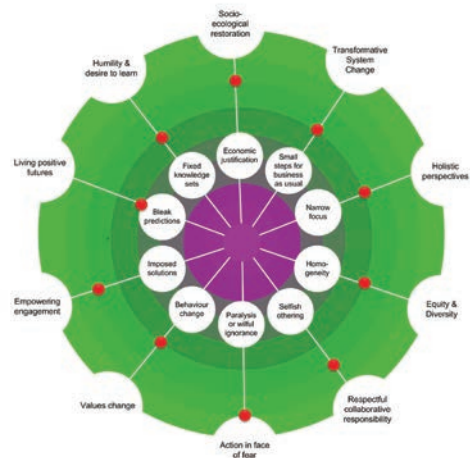Figure 4: Digitisation of process for building consents   Figure 5: Digitisation of process for fisheries management.

The impact of the socioecological and transformation elements can be seen in comparing Figure 4 and Figure 5. Figure 4 represents the application of the Transformation Mindset to a project for local government to digitise the paper-based process of managing building consents. Although the primary driver for the work was efficiency in terms of time, it was also seen as contribution to sustainability (through the elimination of paper). The project though was essentially a business as usual - there was no attempt to eliminate site visits, or enabling of self-reporting by builders. In imposing a solution it had the unforeseen consequence of making some processes harder. The development of a digitisation of a environmental management system for fisheries management (Figure 5, Maxwell *et al.* 2014), by contrast, was designed to enable a system change. While the process replicated a paper-based process, the focus on integrating the benefits so that the information had value for the fishers lifted the process from being one of compliance to adding sustainable value throughout the whole supply chain - from net to plate.

3. Holistic perspectives over narrow focus

This item refers to bigger-picture thinking. This bigger picture applies to time, space, disciplinary boundaries, species boundaries, approaches to inquiry and so on.

Sustainability requires a systems approach (Easterbrook 2014). People need to have awareness that their actions will have impacts. These impacts may be intended and unintended, across scales: temporal, spatial, social, and have positive and negative effects. People need to understand forms of relationships (hierarchies, partnerships, feedback) and that humans form part of a complex web. Systemic thinking emphasises patterns, trends and feedback loops.

Sustainability can be described as ethics extended in space and time (Mann, 2011). This wider ethics calls for solidarity with the entire Earth, ecological sustainability, lifestyles of sufficiency, and a more participatory politics. The underlying force of sustainability as a concept is intergenerational equity but this is largely overlooked – our time spans of concern are almost always far too short.

Figure 6 shows the mindset applied to the development of a carbon accounting system (Calteaux *et al.* 2012). Using a metaphor of a smart budgeting & personal finance software as compared to the snapshot of a bank statement, the project used aimed to take a relationship-based approach to carbon footprint analysis. The goal was to have a personal carbon assistant - 'yes you can buy the new TV but you'll have to walk to work twice a week if you want to stay under two tonnes of carbon this year'. While this project did not take a wide perspective of sustainability - it was limited to carbon - it does show benefit of thinking more holistically in terms of everyday practice.
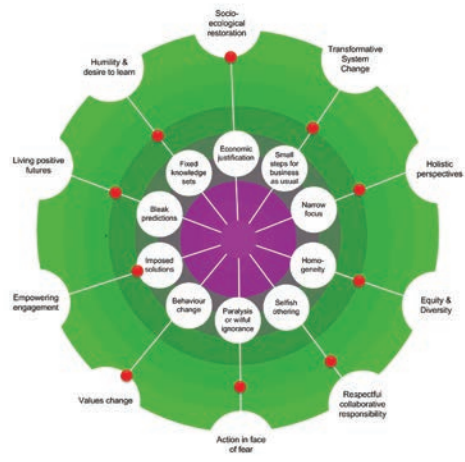
Figure 6: MyGreenFeat

Figure 7: Panda Island

4. Equity and diversity over homogeneity

For Fagan (2009), the ethical imperative is the basis of sustainability: "To live a particular lifestyle that, knowingly, impacts detrimentally on a neighbour – be that an individual living in the next house – or a country in the next Region, cannot, arguably, be tolerated. To know of poverty in the economically developing world and not use that knowledge to act to relieve it, could be considered unethical".

Diverse systems are resilient systems. The call for diversity can be seen to be in tension with the need to transform to sustainability at scale. But it does not mean a homogenous one-size-fits-all solution. Pita Tipene describes this well (2016 np) : "I think that we're all seeking to be a global community and to be truly global we need to both cultivate, strengthen and enhance the small villages that we have throughout the world. To retain that uniqueness and unity through diversity as a key."

5. Respectful, collaborative responsibility over selfish othering

Rather than shifting responsibility onto others, we need to accept responsibility and address the issues together.

Oxfam (in Parker *et al.*, 2004) described a "global citizen" (p. 68) who is, amongst other things "aware of the wider world and has a sense of his or her own role as a world citizen", "outraged by social injustice" (p. 68) and takes responsibility for his or her actions. Using the term "outraged" takes value-based and action-focused further than other such statements. This is, of course a value statement, their "citizens" are not passive but can be described as having a "sense of identity and self-esteem…a belief that people can make a difference" (p. 69). They back these attitudinal
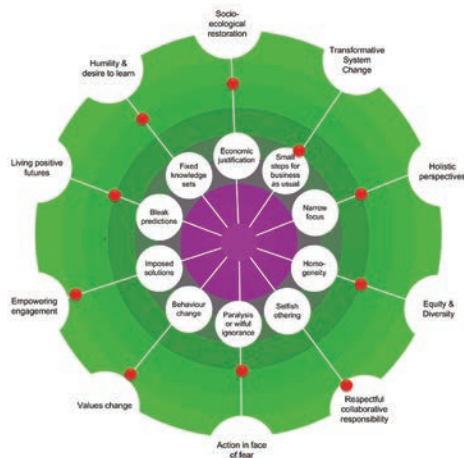

Figure 8: CityScape
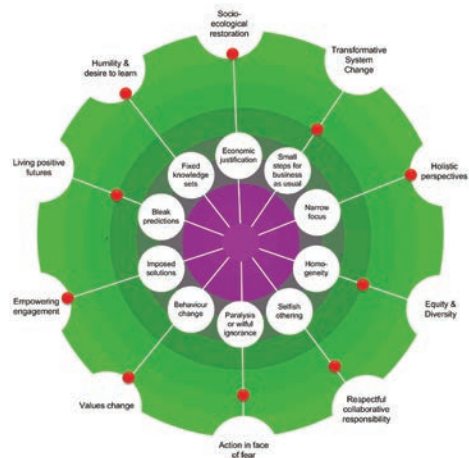
Figure 9: Citizen Science

Figure 10: Community engagement

statements with skills in critical thinking; an ability to argue effectively; an ability to challenge injustice and inequalities; and cooperation and conflict resolution.

Figure 7 shows the mindset applied to a game for teaching problem solving skills as part of a conflict resolution programme in primary schools (Sell *et al.* 2013). This posed particular challenges as most of the traditional elements of digital gameplay were considered incompatible with the goal. The skills of conflict resolution, however, align with the respectful collaboration of the mindset.

6. Action in the face of fear over paralysis or wilful ignorance

In the face of wicked ambiguity , we still need to take considered action rather than suffer paralysis or passively wait for miracle cures. We should also avoid action linked to wilful ignorance (or denial).

Most, if not all, problems of sustainability can be described as trying to address "wicked problems ": Intergenerational time scales, complex systems – that are not amenable to the short-term, positivist approach of most interventions. Instead , we need to learn to live in a complex world of interdependent systems with high uncertainties and multiple legitimate interests. These complex and evolving systems require a new way of thinking about risk, uncertainty, ambiguity and ignorance (Stagl, 2007). These systems require that we can think simultaneously of drivers and impacts of our actions across scales and barriers of space, time, culture, species and disciplinary boundaries.

7. Values change over behaviour modifications

In order to make meaningful long-term changes, there needs to be a shift in values, rather than just addressing harmful behaviours. Intervention that achieves behaviour change without corresponding values is likely to not be as effective due to dissonance felt by the individual.

Sterling (2009) describes the importance of critical reflexivity – or deep questioning of assumptions. This reflexivity, or self-reflection is crucial to the transformation mindset – we need people to care. "First you have to care," argued Attkisson (2008 p. 16) as the first step towards sustainability. We need to embed sustainability itself as a core cultural value of the system.

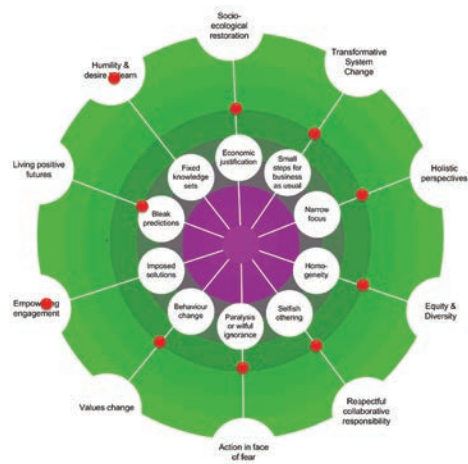Figure 11: Simpa - participatory game development for Iwi cultural content

Figure 12: Participatory decision making

A values basis can be the basis for successful business. Wishbone Design Studio (Latham *et al.* 2016), for example, produces children's bikes. On Willard's sustainability maturity model (2004), Wishbone is operating at the highest level, a values basis where "sustainability-based thinking, perspectives, and behaviours are integrated into everyday operating procedures and the culture of the organization" (Willard p. 31). Wishbone is values-led, entirely based on a framework of sustainability and quality. Wishbone's primary product is a bike that lasts from ages one to five, and then can be passed on to the next young rider. The role of values infuses the business and the relationship with customers "because we declared our values early on – sustainability and quality – we were attracting customers of that same ilk, the pressure on us was not to drop standards, but to raise them" (Latham *et al.*, 2016). The challenge for computing is to develop a similarly values-led business model.

Cityscape is an immersive panoramic exhibition system developed for a local museum (Farquharson *et al.* 2010). The intention was to allow visitors to explore areas and express their creativity, building a community narrative. While the project did not have any intended transformational objectives and did not explicitly consider socioecological restoration, it is notable here for the focus on values - particularly the celebration of place and the community's relationship with place.

Figure 9 summarises the Transformation Mindset applied to the development of a citizen science app designed to improve the ocean foreshore participation and community engagement (Sime *et al.* 2012). This development scores highly on the "Values", "Empowering engagement" and "Respectful collaborative responsibility". In that the citizen science is wider than just data collection and extends to the curiosity and hypothesis formulation aspects, it also scores well on "Humility and desire to learn". It does not, however provide a clear pathway to "Transformative System Change".

8. Empowering engagement over imposed solutions

By empowering individuals and groups, and ensuring that they are engaged, any actions that are taken are likely to be more successful than if 'outside experts' impose solutions. Working with, rather than about, is vital. Ensuring that solutions are case specific and appropriate, rather than a 'catch all'. Actions should be: collaborative; participatory; equitable; open; trusting and supporting of ownership. Building self-reliance should be a goal.

Some are working on community engagement, not as a means for behaviour change, but for the sake of an empowered community: University of Lancaster's work on Tiree (Ferrario *et al.* 2014); Rob Comber's empowering communities (Comber and Mann 2015); and David Green's participatory documentary making (Green and Mann 2015). These research directions are supporting communities to create sustainable futures beyond a behaviour-change-intervention-via-new-product paradigm. Figure 10 shows one such project, PAiNT (unpublished) on the Transformation Mindset. A community engagement focus brings with it a different set of success measures. Another project, the City Wide Energy Meter, aimed at fostering discussions of long-term energy usage (Attfield *et al.* 2014), the success being defined as Community Energy Literacy being an individual's confidence to take part in community consultations.

9. Living positive futures over bleak predictions

While doom and gloom predictions can help jumpstart action, there needs to be more of a positive outlook in order to motivate and capture change. We take an optimistic frame. It is easy to become negative about sustainability. To do so, however, is to miss the point. The focus of sustainability is on the solutions, not the problems. Sustainability is the solution to living beyond planetary boundaries and a finite number of resources.

Orr (1992) argued that "the study of environmental problems is an exercise in despair unless it is regarded as only a preface to the study, design, and implementation of solutions" (p. 94). Schendler (2009) makes an important distinction. He says it is vital that we do not see the challenge (in particular climate change) as the end of the world. Instead we can see "an opportunity on the scale of the Enlightenment or the Renaissance, a rare chance to radically change the face of society forever" (Schendler 2009 p. 46). This is not to deny the problem. Rather, we would argue for demonstrating positive alternatives: transition towns, or co-housing initiatives, for example. Scott (2016) argues that the problem with the green movement is that "they assume, falsely, that change is achieved by brute logic. Change is not achieved by brute logic. It's achieved by, in fact, listen, link, leverage and lead." In other words, by leading positive change.

SimPa, first described by Mann *et al.* (2006) and summarised in review by Weatherall *et al.* (2009) was a collaborative partnership between the Otago Polytechnic and Ka Papatipu Runaka o te tai o Araiteuru. The project aimed to convey and strengthen research aspects in regard to Maori culture, tikaka and knowledge using games programming as the vehicle. (Figure 11). The approach was to develop and use a process of participatory game development for Maori cultural content. This project was entirely about enhancing diversity but in doing so scores highly on most of the elements of the mindset. While the project set out to achieve system change, the outcomes were quite different - still transformational but not what was expected.

10. Humility and desire to learn over fixed knowledge sets

The desire to learn has several implications or variations: humility over wilful ignorance; curiosity over fixed cognitive maps; challenging assumptions over accepting status quo. This then, is a learning mindset in line with Senge's (2008) argument that everything we do is a learning opportunity and Orr's (1992) description of the role of an ecologically literate population. Such people, he argued are "able to distinguish health from its opposite and to live accordingly" (p.108). A mission of education is to give something that "will equip a person to live well in a place (p. 151) But we should never be fooled into thinking we know it all.

The mindset, then, emphasises a curiosity and questioning – a desire for knowledge, but a firm belief that we can never know all the answers.

One discussion-oriented modelling system is PowerSim, a structured process for policy development using interactive visualisation and computer simulation (Randall *et al.* 2012, Figure 12). It is foremost a participatory process to engage people in thinking about issues such as those involved in the development of long term strategies. Rather than a static model, the outcome of the process is the modelling process itself – of increasing understanding,

uncovering assumptions, and in jointly recognising drivers and implications. Thus PowerSim is an example of participatory engagement in policy development. It brings together spatial thinking, systems thinking and consensus decision making.

CONCLUSION

If we take the example of Human Computer Interaction (HCI) within computing, seminal papers such as Blevis' Sustainable Interaction Design (2007) prompted a flurry of research in sustainable HCI. However, as Brynjarsdottir *et al.* (2012) found, much of the resultant research is weak and focusses on a limited framing of sustainability and human behaviour, or, as Meyers and Nathan (2016) bleakly described, with an "impoverished" focus

Aimers and Walker (2016) argue that we need to move beyond a selfish individualistic approach to one of empathy and valuing social capital. Knowles' *et al.* (2013) brings this values approach to computing and describes how the rational, economic man approach appealing to people's wallet is actually disabling the altruistic "we need to be doing this because it's what we need to be doing justification". As an example of this critical questioning, Knowles argued that work to develop computing for sustainability has been hampered by an ecological modernisation agenda – the optimistic thought that greening IT will save the world - "computing seeks sustainability wins that can be found within the dominant ideology of our technological era" but rarely goes beyond "encouraging unfettered consumerism and shallow forms of socialisation".. Knowles would rather a radical agenda that explores alternatives to "an inherently unsustainable digital economy, or challenging the instrumentalisation of the sustainability problem". She concludes that computing has "unwittingly narrowed its solution space", and that even greater opportunities for research might be discovered by going beyond the traditional energy efficiency focussed persuasive technology "to embrace more contemporary, more holistic, and more radical understandings of sustainability". Further, the nature of unsustainability means that by definition the problems aren't amenable to the experimental/intervention paradigm that computer science generally works under.

These goals are not trivial challenges for computing. Mann *et al.* (2017) described a goal of the sustainable transformation mindset is to be used to guide development initiatives. The hope is that the Transformation Mindset can provide a useful tool for computing scholars and practitioners in providing a framework for computing to contribute to a restorative socioecological transformation.

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THE LIVING BUILDING CHALLENGE ENABLING TRANSFORMATION

Steve Henry and Jerome Partington

The Living Building Challenge (LBC), has gained real momentum in Aotearoa NZ and is transforming our design and construction industry. This article explores how this is occurring and considers where it may lead us.

The construction sector in NZ faces many issues around sustainability: The leaky building crisis (New Zealand Herald, 2009) revealed an industry that was hardly fit for purpose and struggled to deliver basic quality and value for money, massive contributions to the country's landfills, disregard for toxicity of materials, unhealthy interiors with endemic health problems in housing, significant and avoidable whole of life costs for maintenance and operation along with a lack of integrated design to counter the standard disconnected silo thinking and poor working relationships through the value chain from pre-briefing, design, construction and operation.

A possible contender to turn this unsustainable sector on its head, is The Living Building Challenge, with the key word Challenge making clear that this is not easy. The challenge for most will be aspirational initially, but have a high standard to aim at raises the bar. The LBC is a stringent international certification program for the built environment. Created in 2006 by the non-profit International Living Future Institute, (Scheer & Moss, 2013) it is offered as a philosophy, advocacy tool and certification program that promotes the most advanced measure of sustainability in the built environment. (Starrs, 2012) The LBC can be applied to development at all scales, from buildings – both new construction and renovation – to infrastructure, landscapes, neighborhoods and communities and is more rigorous and challenging than green certification schemes such as NZGBC, LEED or BREEAM (Leedham, 2013). The key opportunity is the LBC's drive to reconnect our buildings and the users with the natural living system and it's health. Projects using the LBC will require a shift to integrated design and will result in a more sustainable sector along with improved relationships.

In 2011, Jasmax's Sustainability Manager Jerome Partington organised a tour of New Zealand by Jason F MacLennan, the founder of LBC to NZ. This led to an exploration of how to further the Challenge, how to educate the industry about the potential and to engage them in the idea of aiming much much higher than Building Code standard. In 2012, Jerome and Steve Henry of Otago Polytechnic's Centre for Sustainable Practice asked if the construction industry was in need of a course that could bring the challenge to the professionals. To do this they applied a set of questions designed to identify readiness for transformation in any given sector.

- Is the sector clearly unsustainable in its current form?

- Was there inspiring international examples of success to motivate?

- Was there evidence of momentum and desire to shift?

- Was there a person who could champion this work with credibility?

- Who could we partner with to begin?

The construction sector clearly ticked all the boxes and faced many issues around sustainability: The leaky building crisis revealed an industry that was hardly fit for purpose and struggled to deliver basic quality and value for money, massive contributions to the country's landfills, disregard for toxicity of materials, unhealthy interiors with endemic health problems in housing, significant and avoidable whole of life costs for maintenance and operation along with a lack of integrated design to counter the standard disconnected silo thinking and poor working relationships through the value chain from pre-briefing, design, construction and operation.

The LBC offered real inspiration and advocacy, that required recognition of limits and therefore innovation in the project goals, and a completely new 'systems' approach with the potential to transform the built environment. The LBC aimed for healthier and more comfortable spaces for people, more equity and beauty in society and only positive or at worst, neutral impacts on the natural living system. The desire to shift from the dialogue of what was bad, such leaky homes and toxic materials, to one that talked about 'what does good look like?' and a focus on healthy living systems and very high performance (90% less energy used) buildings, was welcomed.

The person to champion this work was Jerome Partington with a background in Architecture, Science, Construction and Sustainability, who had support from organisations such as Jasmax and other design practices and industry professionals, the Green Building Council and Crown entities such as the Energy Efficiency Conservation Authority. These proved to be willing partners in the development of training programs. The Creating Living Buildings short course was established in 2014 and has trained over 150 people, with the goal of facilitating integrated design practice, showing that the goals are achievable, easing the industry transformation by creating a community of good practice. Architects, engineers and project managers have completed the course to date and many projects have emerged such as net zero energy homes and education centres.

Some of these Graduate projects, summarized below aim for whole or part certification under the LBC and others simply apply the principles and goals to deliver quality and high performance buildings. By 2017, the short course had been adopted by Architectural Studies program at Canterbury's ARA Institute and Otago Polytechnic which is an indicator of the mainstreaming of this work.

The completion of the beautiful and exemplar Ngai Tuhoe Te Kura Whare in Taneatua near Whakatane resulted in New Zealand being home to the first Certified Living Building outside North America – a huge achievement and one that laid the ground work for a new regenerative development model of human evolution in pace. The retrofitting of a Dunedin wooden villa by Louis Brown using the LBC to guide success is showing the LBC can be applied at small scale also.

Around 15,000 people in New Zealand have had exposure to the LBC through talks, presentations, open days at LBC projects and professional practice seminars. Print and broadcast media have introduced the ideas and possibilities to many more people as has the fascinating documentary – Ever the Land movie (Grohnert, 2015), Living Futures NZ the local collaborative promotes the LBC, Declare eco-label, education and outcomes with newsletters to more than 2000 people on its database.

Change is afoot.

PROJECTS

1. Te Kura Whare Tuhoe - certified by ILFI as 'Living' in 2017 and multiple award winning

2. Zero Energy House Auckland - certified NZE

3. Tuhoe follow up projects following principles;

   • Waikaramoana Visitors centre - not to be certified

   • Te Tii Ruatahuna store/accommodation - not to be certified

4. Sustainable Coastlines Education Centre designed by Jasmax using 80% salvaged materials aiming for Living Certification

5. Parklands NZE House – aiming for Net Zero Energy Certification

6. Glenorchy Campground - aiming for Petal part Certification

7. Tanglewood House, in design phase – aiming for Petal part Certification

8. Living House Beachlands, in design phase – aiming for Living Certification, Home Star and Passive House certification

9. LBC House projects in Raglan

10. Kahukura design by Jasmax is a 6600m2 Architecture and Engineering school at ARA Polytechnic in CHC - recently completed 'shadow living building' with 85% Red List Free material selection, mega energy efficiency and strong bio-phillic identity may proceed to NZE Certification

11. Pegasus Net Zero Energy School – built with solar thermal and electric arrays- uncertified

12. 'Breathe' - 85 unit urban mixed use village – is an unbuilt design for CHC earthquake rebuild competition – a new inspiring model of community and housing

13. Christchurch Girls High School Performing Arts Centre – Net Zero Energy 'Ready' on an Ministry of Education budget

14. Making Home – Louis Brown Dunedin – refurbishment of suburban villa into a LBC home

15. Declare Label – a new international ecolabel identifying ingredients and non-toxicity for building materials - nearly 40 NZ building products have label

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Artist's Page

THIS NEGLECTED MIRACLE

Pam McKinlay, Jesse-James Pickery and Emily Davidson

At a recent symposium to coincide with the centenary of the 1917 Russian Revolution, an exhibition titled *Art and Revolution* was curated by Peter Stupples.[1] The *Art and Revolution Symposium* sought to question the role of art and artists in the 1917 revolution, in the direction and momentum of art's agency, as well as discuss more generally the part art plays in the affairs of societies undergoing change.

> What role might art and artists have in the swift surge of change? Can art lead the debate about the nature of a post-revolution future? What examples can we put forward from the past to give us some idea of the way to act as artists and theorists of the visual? What are the threats and what the opportunities for art and artists in the unfolding of revolution?[2]
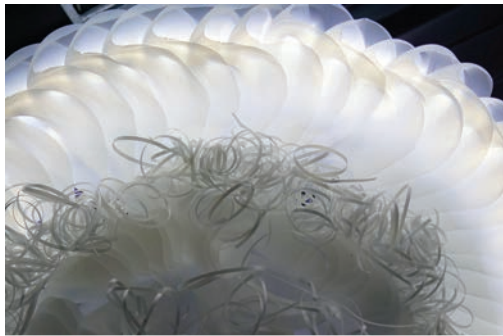
The *Symposium* was held at the Dunedin School of Art, in Dunedin, on October 13-1, 2017, with the exhibition associated with the *Symposium* running from 9-21 October 2017. As in previous exhibitions curated by Peter Stupples, works in the exhibition also explored both aspirations and fears for the future, as well as considering the potential for art to shape points of (future) views. As Dr Louise Baillie says, "Artworks can represent for people and communities what words sometimes cannot."[3] Art can particularly resonate with us when a situation is difficult to articulate, as in times of upheaval, uncertainty, pressure and change.

Down the Rabbit Hole Collective had a multi-authored art work in the *Art and Revolution Exhibition* which was a detail of a larger work and event, being prepared for 2019 around seed saving and exchange, bio diversity and food resilience. The theme of our work was a visual comment on "The Green Revolution."[4]

The installation of the artwork was intended as a form of a narrative space. "Narrative space is a broad term which is referred to in genres and settings as varied as novels and film (storytelling), theatre/drama and virtual reality (role-playing video games) and real-life environments (such as exhibitions and architecture). If, as Kant says, time and space are two of the fundamental categories that structure human experience, then narrative is how we communicate the story or sense of that experience. Narrative space is a way of organising our experiences and making meaning. Is there actually such a thing as a non-narrative space? Since the time of the Renaissance, narrative space in art has also provided a platform for continuous narrative in which several events can be shown in a single setting. However, the story need not be a story in the traditional sense—a narrative space may be a space which is used to convey or explore different themes and meanings."[5]

In this instance, the artwork was a kind of static image, intended as a story-telling tree, which included elements with which to unpack the history of The Green Revolution, its morphing into The Genomics Revolution and a starting point to explore the environmental, social and physical impacts on land and people. The story was told daily at artist floor talks. A pamphlet produced on a risograph was in the gallery at other times to cue viewers into the art work's intention.

This configuration of the **Down the Rabbit Hole Collective** 2017 included Pam McKinlay, Jesse-James Pickery Emily Davidson and Alice Anonymous, all usually of Dunedin.

Figures 1- 8 Installation view, details - Pam McKinlay, Jesse-James Pickery and Emily Davidson, VERY. nearly. substantially. SIMILAR. *, 2017. Shaped vine, up-cycled PTE plastic, hula hoop, muka, LED lights sneaky electronics (full beans), raku fired ceramics.
*The title of the work comes from claims made by a well-known multinational company which promotes heavy insecticide use and genomic modification and is currently at the heart of a backlog of complaints and lawsuits including new suits lodged in 2017 for a new product it launched last growing season.

Pamphlet No. 4.

(another tale from the 'Under the Tree' series - a narrative space about food control by Down the Rabbit Hole)

VERY. nearly. substantially. SIMILAR

The intensification of agricultural practice between from the 1930s was known as the Green Revolution. It included new high-yielding varieties of crops in association with chemical fertilizers and agro-chemicals. Our attempts to feed an ever-increasing world population, and attempts to stave off famine (as defined in the Malthusian Trap) has led us to the genomic revolution. Do we need to reassess what the best way forward is — do we continue to minimalise genetic stock for sake of yield, or do we diversify to safeguard food security in a changing environment? Current agricultural practice focuses on being "Wall-Street-friendly". Plant material is collateral and is commodified in this system of privatization. Business interests are increasingly involved in the patent land grab of the new genomic landscape, the practice of industrial scale factory farming, food production and monocropping have resulted in increased food production at the loss of bio-diversity.

THE GREEN REVOLUTION

To control the people – control the food

To control the food – control the seed

" Very.   Nearly.   Substantially.   Similar "

- promised feast or famine?

Sow not the seeds of dis-content

Reap what you sow,

This neglected miracle.

- A poem by Pam Phlaterre and Alice Anonymous in absentia.

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DUNEDIN BIG EV DAY OUT

Pam McKinlay

INTRODUCTION

Is New Zealand doing enough to meet its Paris agreement goals and what do each of us need to do, to achieve these goals? The three big "C's" of climate change in New Zealand, can be summarised as coal, cows and cars.[1] Encouraging active transport is the gold standard, switching from motor vehicles (man's new best friend) to walking or cycling has obvious benefits for physical health, improving air quality and wider environmental benefits. Electric Vehicles (EVs) also need to be a part of our immediate transport and mobility solutions as a priority for mitigating carbon emissions. Driving an electric car produces 80 per cent fewer CO_2 emissions than a petrol-fuelled vehicle. Closer to home Dunedin has a high rate of car ownership and 40 per cent of Dunedin's carbon emission come from cars.[2] Even when you consider the embedded carbon from production there are 60 per cent fewer carbon emissions across the life cycle of the EV.[3] Cars are the low hanging fruit - getting them off the road where possible and the electrification of transport as fast as possible. Grassroots organisations around the world are taking up the challenge to promote EV options to the wider public with community education.

PARIS

On 4 October 2016, New Zealand ratified the Paris Agreement, a global agreement on climate change adopted under the United Nations Framework Convention on Climate Change (UNFCCC).[4] The Agreement commits all signatory countries to act on climate change, based on a growing body of international evidence of human-induced climate change.[5]

Three key numbers can summarise the goals of the climate talks in Paris in December: zero, two, and one trillion

> Two degrees Celsius is the maximum temperature increase that most global leaders have agreed is the upper limit of tolerable warming, beyond which the risks from extreme climate change are judged to be too high.

> One trillion tonnes is the maximum amount of carbon (a way of counting CO_2) that can be emitted before the planet will be pushed to more than 2°C of warming.

> Zero is the net amount of CO_2 and other greenhouse gases that humanity needs to be emitting by the second half of this century to have a reasonable chance of avoiding catastrophic climate change. [6]

This is what the science tells us, but it isn't only a scientific problem. IT IS A SOCIAL PROBLEM and one that needs a social response. It is evident we are in the middle of a global crisis and 'business as usual' is no longer an option. By omission, our inaction and failure to act with urgency on curbing greenhouse emissions is putting millions of people at risk from sea level rise and more severe weather systems.[7] The people who will bear the greatest physical impact from the effects of global climate change are the people who have produced the least carbon emissions, for example Pacific Island nations and countries with large delta coastlines such as Bangladesh, a country which is

Figure 1. Still from a government sponsored advertisement promoting electric vehicles.[12]

looking at a displacement of 30 million people alone. Associated social flow-ons are extreme pressure on food and water resources, shelter, heating, increased poverty, disease and famine with predicted mass migrations from such climate affected areas, at a scale which make the recent Syrian refugee "crisis" look like a trickle.[8] Whilst these "other" people are facing the very real mortal concerns of extreme deprivation and death, "our" (first-world) concerns are whether any changes we need to make to "our" lifestyle will cause us any *inconvenience*. Following on from the most famous power point of all time (*An Inconvenient Truth*),[9] the truth is we will be inconvenienced, in some way or other by climate change, the issue is to what degree (pun intended).

Closer to home a report released by the Royal Society of New Zealand highlighted local impacts if we fail to curb current climate change trajectories.[10] New Zealand's commitment at the Paris talks is to reduce its greenhouse gas emissions by 30 per cent from 2005 levels and 11 per cent from 1990 levels by 2030.[11] As part of that commitment the NZ government aims to have 64,000 electric vehicles operating in NZ by 2021.

We (each of us) need to be responsible for our individual contributions to global carbon emissions and we each need to be doing more now. To paraphrase Ralph Chapman, we are living in a period of "useful consciousness" – this is our (only) window in which life-saving action *is* possible.[13] What is needed is an immediate managed decline away from the fossil fuel industry and its supporting ICE manufacturing economy and investment in the transition to alternative carbon neutral technologies. Despairingly we've been here before. If we look back in time we are presented with a kind of groundhog-day scenario.[14]

GROUNDHOG DAY

At the turn of the twentieth century a major disruption occurred in transport technology which saw the horse (man's best friend) and cart supplanted by motorised transport options. Within the line-up of potential successors electric vehicles (EVs) were poised to take the lead from the steam car and close rival the internal combustion engine (ICE) aka the motor car. EVs were promoted in a climate of looming fuel shortages and at one point in the early 1900s, were the dominant mode of urban transport in cities such as New York, along with a sophisticated

network of charging infrastructure. [15] As we know EVs failed to take line honours in the technology race, at that time, and the motor car (car being an abbreviation of carburettor) became the dominant mode of transport for the remainder of the twentieth century. As many will know the Ford Motor Company played a key role in this piece of motoring history, but behind the story of Henry Ford's success is a little-known patent law suit, the court battle for which was backed by the Standard Oil Company.[16]

Fast forward to 1996;

> In 1996, GM rolled out the EV1, an innovative battery-powered car, in response to a 1990 California law requiring car makers to produce zero-emissions car. Relentless opposition and suits from automobile manufacturers, oil industry, orchestrated hype over a future hydrogen car, and finally the George W. Bush administration [saw the recall of the EV1].

This story, retold in the documentary Who Killed the Electric Car, is a lament to the General Motors total recall of all EV1s ever made. The movie concludes with a poignant aerial shot of the crushed bodies wasting away in a remote field.[17]

Last year it was calculated that the last new gasoline-powered vehicles could be sold no later than 2035, if we were to keep the world on track to the most stringent goal set by world leaders last year in Paris, that is to 1.5 degrees of warming.[18] In response several countries have set dates to implement bans on all new internal combustion engine (ICE) vehicles. To name a few examples Norway – starting in 2025, all new passenger cars and vans sold must be zero-emission vehicles; France - no new sales of petrol or diesel cars starting in 2040; United Kingdom – no new sales of petrol or diesel cars starting in 2040. Austria, China, Denmark, Germany, Ireland, Japan, the Netherlands, Portugal, Korea and Spain have all set official targets for EV uptake.

At a time when the world is demanding clean renewable forms of energy and reduction in carbon emissions, climate change denial is still being funded by big corporates interests with substantial investment and profits at stake in the status quo. Such activity has been ongoing since the inception of the Global Climate Coalition in 1989. The group's name suggested that the group held the best interests of the planet at stake rather than the pockets of climate change denial lobbyists, some of which are now facing potential law suits over misleading the public.[19] (Closer to home we had the New Zealand Climate Science Coalition, which was until recently well-funded to reject

Figures 2-4 from left; McKinlay family phaeton, Lawrence 1891; DVD cover – "Who Killed the Electric Car," "last fuel stop" sign for Petrol vehicles, Portobello, Dunedin, 2017.

mainstream scientific information about man-made climate change.) This is no more obvious than recent news that President Trump will withdraw America withdraw from the Paris agreement and roll back other legislation in the United States of America which had aimed to reduce its green-house emissions. Despite all this we now appear to be living in a period of EV comeback and grassroots organisations and individuals are doing their part to advance change.

GRASSROOTS ADVOCACY

The Dunedin EV Owners Group was started in 2015. A core of committed and knowledgeable EV owners offer support and advice to new and prospective EV owners and promote the idea of Electric Vehicles to the wider public in Dunedin and the wider Dunedin area. For many buying an EV is "leap of faith". The technology is new and changing rapidly, the costs of purchase involved are high and people unfamiliar with the technology have fears around how to charge etc.[20] Events run by the Dunedin group are usually small-scale community showcases, talks or presentations and they also support other community events such as Vogel St Party and sustainability and research groups for example Otago Energy Research Centre. They work in close association with the Better NZ Trust for their annual Road Trip (Leading the Charge) see Figures 4 and 5 below, FlipTheFleet (a Curious Minds Citizen Science Project), hold public forums (ChargeUp Dunedin) to advocate for local rapid and other charging infrastructure and organize events as part of International Drive Electric Week.

Cape Reinga to Bluff is a long trip in anyone's book (3000km give or take a few km) but once a year a group of EV owners give up their time and travel the length of NZ in electric vehicles. The annual Leading the Charge Road Trip aims to highlight the advances in EV charging infrastructure, EV ownership, and public knowledge of the electrification of transport throughout in New Zealand. The fact that this group is driving the length of New Zealand demonstrates that it is possible for others to so also. As the Leading the Charge touring cars travel up the country they are supported at pit-stop events along the way by local EV owners' groups. This year they were joined by over 400 EV owners in towns and cities along the route, including in Dunedin, and tens of thousands of people attended events.

Figure 5 and 6. Screengrab of charging stations across NZ (as at Sep 10 2017) source http://www.revup.net.nz/PlugShare.aspx; Morgan Knoessen, a visiting EV owner from Wanaka, charges at the Filluel Street rapid charger in Dunedin, August, 2017.

Figure 7 and 8. EV Owner groups in North Island (left) and South Island (right) hold regular EV education events and support Leading the Charge outreach events such as Leading the Charge Road Trip.

INTERNATIONAL DRIVE ELECTRIC WEEK

International Drive Electric week is a week which focusses attention on EVs with a thunderclap of media attention across the country.

> International Drive Electric Week is a worldwide celebration to heighten awareness of today's widespread availability of plug-in vehicles and highlight the benefits of all-electric and plug-in hybrid-electric vehicles. Started in 2011 as National Plug in Day in the United States, with the simple idea to hold simultaneous events across the country on the same day, by popular demand it was expanded to an entire week of grassroots events.[21]

In 2015, Drive Electric Week (America) became an international event with invitations to EV groups in other countries to participate. "International" Drive Electric week now more accurately represents its coverage and importance. New Zealand participated in 2015 with one or two events. The following year, events were held in twenty New Zealand locations. Each Drive Electric week event is led by local EV owners' group and typically includes some combination of EV showcase, ride-and-drives, informational booths, talks and more. In Dunedin alone this year the local EV owners Group organized sixteen events and activities over the course of the week to promote EV awareness.

The Dunedin Big EV Day Out was the major event for the Dunedin EV Group in 2017. A record attempt for the most EVs in one place at the same time, was held on Sunday 10th September, at Forsyth Barr Stadium. The wider aim of the EV park-up was to visually demonstrate Dunedin's EV population. As an artist, I wanted to make a document of the attempt – a kind of big Dunedin EV-extended-family photo to record this milestone of early EV adoption in Dunedin's EV history and made as sequel to a short film made last year.[22] I was inspired by a photo in the Christchurch Star Weekender of a large number of 1920s EV s assembled for a photo in Bealy Ave,[23] and also wanted to reference the abandoned EV1s rusting away in some distant dusty field.

The Dunedin Big EV Day Out gave members of the public a one of a kind opportunity to meet a large number of local EV owners, from all walks of life, and talk to them about their experience of EV ownership and driving in Dunedin and the wider Dunedin area. Word of mouth and test rides and drives are the best way to demystify electric cars (and e-bikes) and win over hearts and minds. People are free to ask any questions, without any pressure or spin they might feel if asking a car dealer. Nine models of (off-the-shelf) Electric Vehicles (new and second-hand) and a range of e-bikes were also on display and available for test drives. The event received multiple pre-event and follow-up news coverage and the dramatic visual documetation of the *Big EV Day Out* photo has been in demand ever since. [24]

Figure 9. EV park up of Dunedin EV Owners at Dunedin's Big EV Day Out, Forsyth Barr Stadium, 10 Sep 2017.

The event planning which began in March, blossomed to become a family friendly EV gala day. Wrapped around the EV guest-experts, technical booths and charging demonstrations etc were science demonstrations, local sustainability project stalls, live music and child friendly entertainment such as face painting as well as food vendors and more. Special interest EVs were on display including NZ's oldest electric car still in use, a 1904 Baker Electric, a built from scratch electric racing vehicle and several local home-conversions. Elsewhere in the country the Motor Trade Association (MTA) were celebrating 100 years of MTA in NZ, in response we had a feature exhibition of "100 years (plus) of EVs in NZ."

Over 2000 people came through the venue doors and visited the showcase and indoor activities on the day. Participating owners reported a non-stop series of conversations with interested members of the public and forty-five people went for test rides and test drives in EVs and forty on e-bikes, in the public session of the event between 12 and 2pm. Dealers reported strong interest on the day and an upsurge in interest and sales in the following weeks. And that 'record' attempt? At the 12noon cut off point we had 135 EVs in one place, just twenty-five short of Auckland (who had set the new record on the previous day at 159). This was an impressive outcome for Dunedin, given our size and lack of public charging infrastructure. The *Big EV Day Out* photo was in circulation by 9am Monday morning and was key to discussions at the ChargeUp Dunedin meeting later in the week at which the Dunedin City Council made a joint announcement with Charge.net NZ for three additional rapid chargers to be installed in Dunedin and other support for future EV initiatives in the city.

Figures 10-11. Montage of photos from the event.

CONCLUSION

"Think global, act local" has become the new mantra as we scramble against the clock to find ways to stall the trajectory of climate change. We can all make a difference as ordinary people by making small, ordinary actions, made necessary by the time we are born into. To quote Thomas Berry,

> This is a work not chosen by us; indeed, it was chosen for us, by the fact of our being born into this time of crisis when the very structure of the Earth is threatened and the extinction of species continues unimpeded.[25]

Changes are not happening at a fast-enough rate. Regarding transport, it may appear that the age of EV is inevitable, but there are many behavioural barriers to overcome before EVs become the norm. The science is in. What is needed is a social and active response, to complement existing and ongoing research. Efforts by early EV adopters and grassroots groups aim to help accelerate EV uptake by educating the public by busting myths and demonstrating the benefits of EV and in general raising EV awareness. This is done by word of mouth and community based education events.

"There are no rules for living on this planet, only consequences."[26] Every km travelled in a petrol-fuelled car is a cost to the environment. We need to stop pretending - time's up for that road trip.

Figure 12. Zero Emission – side panel of Nissan LEAF from event in Octagon, April 2017.

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