

Graduating a Sustainable Practitioner

*From new student to sustainable
practitioner - the educators role*

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Executive Summary

- Otago Polytechnic are leaders within New Zealand, when it comes to their Sustainability Strategic Framework and the objectives contained therein, including graduating sustainable practitioners
- Before Otago Polytechnic can graduate our students as sustainable practitioners, staff need to be enabled and graduate themselves as sustainable practitioners
- The statement above is supported by this research project which has included the literature reviews, expert interviews, an online survey and one on one interviews with staff.
- The use of a common framework to frame all discussions and actions in regard to sustainability is supported by this research too.
- The Otago Polytechnic Centre for Sustainable Practice recommends the use of the Framework for Strategic Sustainable Development (FSSD), therefore this would be the framework this research recommends.
- A strategic plan for a collective and comprehensive staff training and support programme is recommended in this research paper. This programme requires considerable investment to be effective, which should be centrally funded. However, Otago Polytechnic may be able to successfully obtain funding and the subsequent production of a research outcome in this regard from sources such as AKO Aotearoa.
- Once an effective training and support programme is established, revenue diversification opportunities potentially exist in providing consultancy services and sustainability resource/education packages fit for organisational purpose i.e tertiary institutions nationally and internationally.

Introduction

This project is designed to look at how to effectively graduate sustainable practitioners, and therefore meet objective 1 of the Otago Polytechnic Strategic Framework for Sustainability - to develop sustainable practitioners.

There are many resources and tools available to help educators deliver a curriculum in Education for Sustainability (EfS). These ensure that students have a developing awareness of the environment they live in, what needs to be done to ensure that the planet remains healthy and ensuring that people on earth can continue to live here in a meaningful way.

However when it comes to educating a sustainable practitioner, much less has been published on this topic. Educating everyone as sustainable practitioners is the objective that has been set at Otago Polytechnic as part of the Sustainability Framework. Throughout this project the Framework for Strategic Sustainable Development (FSSD) will be used to highlight what a sustainable practitioner is and how this can be achieved, and also how the FSSD can be used as a tool for Otago Polytechnic to achieve success in graduating sustainable practitioners.

A sustainable practitioner must understand the interactions between environmental, social, cultural and governance issues and how they fit together within a business environment or within a community or other group. In terms of a business, in order to have influence and effectiveness, graduates need to understand the language of business - which is primarily financial and also need some skills in understanding how to design solutions to take them from the present situation to the vision of a sustainable business. This requires the students to be given a set of tools, and opportunities to use them in the safe student environment, so they can gain confidence with them, ready to use them in a commercial environment post-graduation.

For this to be effective for the students, it requires academic staff, and for a holistic approach general staff as well, to have a specific set of tools and training to ensure that students are being educated to meet these requirements. In addition these tools can be used by the staff members to help improve their own sustainable practice and that of Otago Polytechnic.

To date training has been voluntary and the training available, whilst having strengths, also has weaknesses when we look at what Otago Polytechnic are actually trying to achieve with the Strategic Framework for Sustainability. In the opinion of the author, the lack of time (overfull programmes and workloads are examples of this, reflected in the Otago Polytechnic Work Environment Survey year after year), lack of real understanding of what actually needs to be done and financial constraints have also contributed to a less effective implementation of this objective. A strategic plan with a clear direction which includes compulsory training, bold initiatives and a realistic budget is required to enable effective implementation of objective 1.

Project Background

Introduction

Background information to frame this project can be found in this section. This project centres around the Otago Polytechnic Strategic Framework for Sustainability; use of the FSSD and the training for Otago Polytechnic staff. Details of the framework, FSSD and current training available are included in this section as background information. .

Strategic Framework for Sustainability

One of the four strategic frameworks by which Otago Polytechnic operates, is the Otago Polytechnic Strategic Framework for Sustainability.

To quote from the Otago Polytechnic Website

“Sustainability plays a major role at Otago Polytechnic, influencing both our day-to-day operation and our future decision-making.

Sustainability means that we consider the social impact of each decision we make. It’s all about balancing our goals with practices that protect and support our society and environment. We’ve made a pledge, both to our community and our students, to do the right thing – working towards a sustainable future for ourselves, and future generations.”

The Otago Polytechnic Strategic Framework for Sustainability has four key objectives

1. To develop sustainable practitioners
2. Sustainable Operations
3. Helping communities and businesses
4. Ensuring our actions benefit our communities

Otago Polytechnic has clearly stated and publicised its vision. The challenge now is that Otago Polytechnic really take the lead and make bold steps forward. Failure to do this is to risk Otago Polytechnic's reputation.

This project focuses on the objective of delivering EfS in the context of developing a sustainable practitioner, which is objective 1 of the Otago Polytechnic Strategic Framework for Sustainability. EfS is defined as the practice of teaching for sustainability (**Wikipedia**). This practice is required to be embedded within every programme, which means there are learning and assessment outcomes to demonstrate the development of knowledge and skills to enable the student to practice as a Sustainable Practitioner.

In addition, Otago Polytechnic staff have pledged (**Otago Polytechnic, A simple pledge**) to graduate practitioners in every field they educate students in that have the tools to enter their area of expertise and be able to practice sustainably. EfS in action is the student identifying a problem, using the tools to focus on the actions for sustainability that need to be addressed and then planning and implementing action. A simple example, for a veterinary nursing student, might be identifying that disinfectants and other chemicals are going down the drain, many of which have negative effects on the environment. They can then use the tools they have been given to vision what it looks like when it is sustainable and work out a plan to get there, which would include auditing everything that goes down the drain and identifying alternatives.

Staff have returned a high agreement level in the Work Environment Survey (WES) on the topic of sustainability which was asked in the section “My Job”: Q 9 I have a good understanding of how to practice sustainability in my job/role. The agreement rating was 95.7%. However the question is weak and does not give a baseline level of what that person defines as sustainability in their job/role to compare it too. A recent survey conducted in the School of Veterinary Nursing looking at the students’ definition of sustainability at the start of their programme, shows an overall weak understanding of the topic, which is reflected in the weak actions (information that was also collected in the survey) of most students. The purpose of the Veterinary Nursing survey was to get a student baseline measurement prior to embedding the schools EfS programme. The School of Veterinary Nursing is planning to run a follow up survey at the end of the year to look at effectiveness of their EfS during the year.

Anecdotal evidence from a staff development day session in October 2013, and from participants of the *Adding Sustainable Value* programme (ASV) last year, is that there is a lack of guidance and framework around how staff are given the knowledge and empowered to embed sustainability into programmes. In the current situation staff and schools are left to work out what all that means with limited guidance.

A discussion that comes up regularly and is well recognised is that the academic schools at Otago Polytechnic have tended to operate relatively independently for a very long time. While the intentions are there to share and work together, current workloads and location, among other reasons mean that good work and results are often not shared to benefit others when it comes to implementation of things such as EfS. Unfortunately this is a repetitive cycle as working independently is likely to result in an increased workload and potentially a less effective result, hence investment in working together will have multiple benefits.

The Framework for Strategic Sustainable Development (FSSD)

The FSSD uses a five level framework and within that are various tools such as the funnel, auditing against the system conditions, visioning what a sustainable future looks like and backcasting to work out how to achieve that vision.

Hart and Milstei discuss the need to present a sustainable value framework that shows value to the shareholders, rather than sustainability being a single dimensional subject. This backs up that Otago Polytechnic need to ensure that their staff are able to present a framework around approaching sustainability that appeals to the wider community, including the business fraternity. The FSSD is invaluable for checking that a sustainable practitioner understands each of the 5-levels of sustainability from the systems we need to adhere to, what success looks like in a particular area when we meet the system conditions, and how to get there.

The FSSD, is a framework used by The Natural Step (**TNS**), which is a globally recognized network of offices and individual associates that share the same brand, principles and training in strategic sustainable development. They have 25 years experience helping organizations and individuals understand and make meaningful progress toward sustainability. Their vision is “... a world in which human society thrives within nature's limits”. Otago Polytechnic has a partnership with TNS and the FSSD is the preferred framework for the Otago Polytechnic Centre for Sustainable Practice. This allows it to introduce a common language and enable implementation of effective sustainable practice.

Figure 1 - The 5 level framework of the FSSD - [Framework for Strategic Sustainable development.](#)



Level 1 - System

In order to become a sustainable practitioner everyone needs to understand the systems in which they are operating.

The systems include: environmental, social, economic, governance, cultural and the education system. Systems thinking considers all of these but more importantly how each system interacts with each other.

The FSSD uses 2 tools at this level.

1. **Drivers of Change** - these are the things that are going to squeeze people, a business or the profit for example and potentially cause a failure in the business, stopping it from being a future focussed, resilient organisation into the future. Drivers of change provide a way of articulating why change is imperative. The drivers of change are often presented using a funnel metaphor which is explained below.
2. **The four system conditions** - the conditions in which everybody needs to operate in order to be sustainable. They are a definition of sustainability.

Drivers of change:

The drivers for change for Otago Polytechnic, in enabling staff to bring about the vision of graduating sustainable practitioners:

- Otago Polytechnic's expectation that the objective of graduating sustainable practitioners is met. The pressure to achieve this is increasing.
- There is an increasing urgency (and widespread agreement) that things need to change worldwide and that education is a key part of this.
- Otago Polytechnic academic staff have increasing requirements to fulfill and less and less time to do so. If things are framed in a way that makes it achievable more success will occur.
- Resources, including finances are increasingly stretched. There are continuing requirements to do more with less.
- Lack of knowledge across the board in the academic staff on exactly how to meet this objective of every graduate is a sustainable practitioner.
- Need for all the staff to live the values of Otago Polytechnic and understand and act as sustainable practitioners.
- Individual opinions still play a big role rather than a combined team approach to the subject and objective.
- Lack of support from people who can help to facilitate EfS and mentor each school as they work through it.
- Many current national qualifications are over full with content and do not offer the scope to assess sustainable practice - which is part of the requirement of meeting this objective. This adds pressure to deliver more in already over full programmes as well as create additional assessment, which in the case of a current national qualification, if a student fails that aspect, they can't technically fail the unit standard.

Drivers of change can be depicted using a funnel metaphor. The funnel shows decreasing resources and increasing demands and how the drivers of change (if changes are not made) are pushing the business to hit the wall when considering meeting the objective of graduating sustainable practitioners. The key is to recognise the drivers of change and make changes to allow Otago Polytechnic to navigate through the bottleneck to a resilient sustainable future

[Click here to see these presented diagrammatically in a funnel](#) (Slide 6). It is possible to see in this diagram, that Otago Polytechnic are already hitting the wall for most of these drivers of change, or will be in the very near future. The three that will make the most difference if they are addressed are highlighted in the funnel.

System Conditions

Knowledge of the system conditions provides a common definition of sustainability that is supported by the TNS. They also provide a way of auditing a business, area or location against these to determine a baseline.

In order to graduate as a sustainable practitioner, and for Otago Polytechnic to meet objective 1 of the Strategic Framework for Sustainability, a student studying at Otago Polytechnic will need to apply the system conditions (figure 2) and take action, in the way that they practice.

For this to be able to occur all staff need to understand the 4 system conditions. When we are adhering to each of these system conditions our society will be sustainable. In figure 2, from The Natural Step, you can see the four system conditions and then these reworded to be the four sustainability principles which need to be adhered to to become a sustainable society.

Figure 2 - [The 4 system conditions](#)

The Four System Conditions...	... reworded as The Four Sustainability Principles
In a sustainable society, nature is not subject to <i>systematically increasing</i> :	To become a sustainable society we must eliminate our contributions to...
1) concentrations of substances extracted from the earth's crust	1) the <i>systematic increase</i> of concentrations of substances extracted from the Earth's crust (for example, heavy metals and fossil fuels)
2) concentrations of substances produced by society	2) the <i>systematic increase</i> of concentrations of substances produced by society (for example, plastics, dioxins, PCBs and DDT)
3) degradation by physical means	3) the <i>systematic</i> physical degradation of nature and natural processes (for example, over harvesting forests, destroying habitat and overfishing); and...
4) and, in that society, people are not subject to conditions that <i>systemically</i> undermine their capacity to meet their needs	4) conditions that <i>systematically</i> undermine people's capacity to meet their basic human needs (for example, unsafe working conditions and not enough pay to live on).

Level 2 - Success

This level describes what success looks like. Success is when the four system conditions above are met.

In terms of this project, success is what it looks like when Otago Polytechnic has met the objective “To develop sustainable practitioners” and all graduates leave our polytechnic giving the feedback that they have been trained as a sustainable practitioner.

Level 3 - Strategic

At the strategic level Otago Polytechnic need to identify the parts of the vision that will have the biggest impacts. If the vision is that every graduate is a sustainable practitioner, then what are the aspects of the vision that will have the biggest impacts and are most important to achieving the objective. These are the actions that need to occur first, to get the results required to meet the vision. Strategic planning requires identification of who needs to be engaged, how to get people on the journey, the communication required and the budget to achieve this.

The main tools here are:

- Ensuring the strategic plan answers the 3 prioritising questions:
 1. Is this moving you toward or away from your sustainability vision?
 2. Is this a flexible platform to support future actions toward your sustainability vision?
 3. Will this offer an adequate return on investment?
- A communication and engagement plan for the people affected
- A realistic budget to implement

In this project, engaging with all staff is required to meet this objective is essential. They need an opportunity to discuss the vision that every graduate is a sustainable practitioner, the varying views on the topic and then be involved in agreeing to a common framework. Once this is agreed, work towards training in this common framework can begin.

Level 4 - Actions

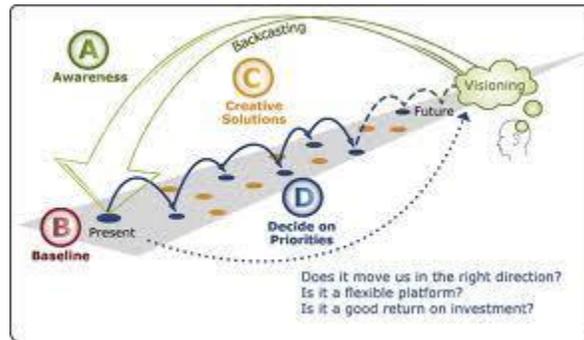
Once those parts of the vision have been identified and prioritised, a plan can be created. In this case the action list is likely to be around the tools and training staff require. To maximise engagement, it would be valuable to use a team approach to creating the action list, so that the people involved are on board.

Level 5 - Tools

Level 5 encompasses the tools to help achieve the actions. The tools are designed to help implement actions, and to manage and measure success. Tools are required for each level of the framework. In this situation tools might include the funnel to communicate the drivers of change, a vision of what it looks like when the objective is being met, revised training courses, mentoring programmes and a budget to effectively achieve the strategy. Measurement might include baseline and end of year surveys for students that really evaluate what they have learnt, and perhaps a post-graduation follow up to review implementation in business and community. It may also be useful to track the improvement in knowledge of staff too.

A tool used at all levels is the ABCD planning model (see figure 3). A is the awareness - this can be highlighted using a SWOT analysis and drivers of change funnel. B is the baseline - the drivers of change funnel, an analysis of the 4 system conditions are used to highlight this. C is the creative solutions, which includes visioning as to what a sustainable future in that field looks like. D is the prioritising what actions need to be taken to reach that vision. [Review a diagrammatic version of how the ABCD planning model fits here](#)

Figure 3: [ABCD Planning model](#)



Literature review

The literature review shows the importance of tertiary education as an essential tool to improve practices to be more sustainable worldwide. It also provides some background into the challenges other tertiary institutions have had around embedding EfS even though the leadership and drive is often there. It is stated in the literature how important staff training is to this subject but overwhelmingly, that there is a lack of guidance and direction for staff which appears to be a significant factor in failure to implement effectively.

The first part of the review looked at the overall governance required for an institution to embed EfS and the second part looked at the core competencies of an EfS student and how to create these.

The literature will be used, as part of the results, to inform some practical steps for Otago Polytechnic to achieve its vision and show how the FSSD can be used to achieve that.

For full literature review write up see Appendix A

Otago Polytechnic staff training currently available around EfS and Sustainable Practice

As is supported by the literature review, training of academic staff is important for Otago Polytechnic to achieve the goal of graduating sustainable practitioners. However this is currently voluntary and only a minority of staff have undertaken any training. This section summarises the two training programmes available and highlights their strengths and weaknesses which need to be addressed in future training for Otago Polytechnic staff.

Adding Sustainable Value

In Semester 2 of 2013, there was a pilot of the Adding Sustainable Value Programme (ASV). It had an uptake from 1 or 2 people from each of 4 academic areas and 4 service areas.

This programme provides a framework for learning a common language and allows staff to develop a long term vision for what a sustainable future looks like in their particular school or service area and how it fits within the whole polytechnic. This common language and knowledge of the FSSD is considered invaluable to allow cross group communication and also communication from staff to students.

The objectives of ASV, the programme which was designed for traditional businesses (rather than tertiary institutions) as detailed on the ASV website are in the box below:

The Adding Sustainable Value programme provides you and your business with an internationally successful framework that will accelerate your sustainability journey – guaranteed.

- *Apply an internationally successful framework that will accelerate your sustainability journey – guaranteed.*
- *Get the critical thinking, analysis and planning skills you need to create success from new opportunities and drive innovation*
- *Learn with and from industry peers, expert speakers and leading practitioners*
- *Reduce risks and costs as you target new opportunities*

The learning outcomes, detailed in Table 1, show that there is no guidance in how to educate the students to be sustainable practitioners. The learning outcomes focus on the business unit being more sustainable and developing a strategic plan for this.

For a diagrammatic look at what ASV does, [refer to this link](#). This shows that students of the ASV look at their business unit, identify strengths, weaknesses and drivers of change, and then come up with a vision. Part of that vision is likely to be that all their graduates are sustainable practitioners, but this is where it stops. The ASV programme includes no training on how to deliver EfS in a way that engages students to be able to act as sustainable practitioners on graduation.

Education for Sustainability (EfS) course (Wikieducator)

This course was developed over 5 years ago and is delivered fully online, using Wikieducator to present resources. In the past 5 years it has had 14 participants. Students can enrol at any time. Mentoring from a tutor is available. It can be selected as an elective as part of the compulsory teaching qualification academic staff at Otago Polytechnic must obtain or as a standalone course.

The learning outcomes for this course are summarised in Table 1. They show that the EfS course explores the notion of the importance of thinking sustainably and what it means to different people. It introduces some concepts but it doesn't provide answers or even guidelines on how to approach this from an educational perspective. This is still left to the individual to decide which methodology to follow, and interpretation may be dependent on personal opinion. There is no framework given around how to deliver EfS to meet the objective of graduating sustainable practitioners in the Otago Polytechnic context.

In addition, it does not cover the FSSD, which is considered by sustainability leaders within Otago Polytechnic to be an essential framework if we are to meet this objective of producing graduates who may practice sustainably. There is also the risk that this course, which is only an elective in the old Graduate Certificate in Tertiary Learning and Teaching (GCTLT) or the new Graduate Diploma in Tertiary Teaching (GDTL), is not viewed as important due to its elective nature.

The EfS course does require action competence and critical thinking which are important in EfS (refer literature review) - but as mentioned above, the primary weakness appears to be the common framework which is recommended to maintain consistency across the institution.

Table 1: Learning outcomes for the 2 current courses available for educators at Otago Polytechnic

Learning Outcomes - EfS course	Learning Outcomes - ASV
Identify the process and content of EfS	Equip yourself with real understanding about what sustainable practice means for the successful future of your school or service area
Demonstrate knowledge and understanding of the terminology and concepts that underpin EfS	Identify relevant opportunities and address potential risks
Analyse your own teaching/profession in relation to EfS using reflective practice	Audit your current performance to benchmark improvements
Utilise the concepts of action competence and critical thinking in relation to EfS	See the benefits of aligning economic, social and environmental performance and begin that process
	Develop a strategic plan for your school or service area that integrates sustainable practice
	Develop an action plan for your school or service area for implementation

SWOT analysis

A SWOT (Strengths, Weaknesses, Opportunities and Threats) is a planning method that is undertaken before objectives are set, that allows an organisation or individual to plan how to achieve an objective.

The SWOT analysis below shows that Otago Polytechnic has a number of strengths and weaknesses when it comes to graduating sustainable practitioners. From the weaknesses come opportunities which should mitigate the threats.

The SWOT analysis is used to help identify drivers of change, the vision and the gap between the current situation and the vision, when the objective, that every graduate is a sustainable practitioner is achieved.

[Review a diagrammatic version of the SWOT analysis here](#)

Strengths:

- Industry leaders
- Future focussed
- The sustainability strategic framework attracts students
- Senior leadership are right behind this

Weaknesses:

- Lack of formal staff training for both academic and general staff
- Implementation and success of EfS is not measured in a meaningful way
- OP strategic framework for sustainability was in place before the skills and knowledge to deliver on it
- Lack of leadership to go from the idea to actual implementation
- Staff in many cases are struggling with the day to day requirements associated with their position and the importance of EfS is not deemed sufficient to add to that

Opportunities

- Formal staff training to improve success in this field
- Leadership that drives it forward
- A common language for conversations
- Developing and using good success management tools
- Consultancy to other educational institutions to effectively embed EfS
- The opportunities being driven externally to OP, i.e. there seems to be ongoing engagement by business in sustainable practice e.g. Sustainable business network (SBN) and New Zealand Small business collective (NZSBC).

Threats

- Other providers beginning a journey for EfS and then overtaking us by doing it better
- Not doing enough to really make a difference
- Our students are marketed as sustainable practitioners, but this is not universally so
- Lack of awareness and support by central government, or Ministry for Education at a tertiary level

Overall vision

In the ideal situation, all staff (academic and general) employed by a tertiary institution committed to a sustainable vision would already buy into the values the institution has. They would all receive training in a common language prior to taking the message to the students. This would allow the staff to talk knowledgeably against principles in any discipline and any staff member the students meet will convey the message using the same principles and by walking the talk. They would then be given training about how to take the knowledge to facilitate their students using an interdisciplinary approach to solve problems in their industries. Programmes developed at a national level would be designed to ensure that they were packaged to not overload the student, but to allow for the development of the person and include EfS and communication as pivotal overarching principles and with measurable learning outcomes. Staff across disciplines would meet, communicate, discuss and mentor each other and be involved in setting team and institution targets to improve sustainable actions and outcomes as sustainable practitioners.

The vision of this project is to propose a strategic plan to develop tools and processes that will support the academic staff embedding EfS into their programmes that will guide students towards the objective of “Every graduate of Otago Polytechnic is able to practice as a sustainable practitioner” (**Otago Polytechnic Framework for Sustainability**).

[Review the vision diagrammatically here](#) (Slide 7, after the funnel)

The Gap

There are apparent barriers to embedding EfS into Otago Polytechnic to allow academic staff to be effective in meeting objective 1 of the Sustainability Framework *“To develop sustainable practitioners”*.

The current EfS course within the teaching qualification that staff undertake is an elective with low uptake - there have been 14 participants of this course since it started over 5 years ago. This course doesn't embed the language that is being promoted by the Centre for Sustainable Practice, which is the FSSD. This framework has been recommended by the Otago Polytechnic Centre for Sustainable Practice as the appropriate language to have conversations around this subject. **Holmberg and Robèrt (2000)** describe how the use of backcasting when looking at complex problems is extremely useful. This is a key element of the FSSD.

The ASV programme, which was piloted in 2013, uses the FSSD and is designed to develop a sustainable business. However, unlike a traditional business, the business of education has an added requirement of delivering an education to graduate a sustainable practitioner. What appears to be lacking in the ASV is guidance on how to transfer knowledge of the FSSD to effectively embedding it in a programme and succeeding in the role of educating students to become sustainable practitioners.

There is a need to validate this apparent gap and then provide a solution to it, in order to help Otago Polytechnic to improve its effectiveness in meeting its objective *“To develop sustainable practitioners”*. A framework to deliver this objective such as the FSSD (see section above) is likely to be a key feature of closing this gap.

[Review the gap \(slide 9\) in a diagrammatic form linked to SWOT \(slide 5\), drivers for change \(slide 6\) and Vision \(slide 7\) here](#)

Research Question, Aims and Objectives

Overall question

What changes or additions are required to the current tools and training of Otago Polytechnic's academic staff to implement EfS so that the objective: *“To develop sustainable practitioners”* can be met.

Aim 1:

Identify what is effective EfS and how it could be used to meet the objective of graduating a sustainable practitioner

Objectives

1. Review literature to identify what defines effective EfS
2. Interview experts on the subject

Aim 2

Identify the barriers to effective EFS implementation at OP

Objectives

This research gathered data/feedback via an online questionnaire and in one on one interviews of academic staff that indicated in the survey they would be happy to have further involvement. The objective is to gain an understanding of:

1. Efs and sustainable practice from a staff perspective.
2. how staff view their personal effectiveness in meeting the objective of graduating sustainable practitioners to date.
3. what staff view as requirements to increase effectiveness in this area.

Aim 3:

Identify training and tools that would build staff capability in sustainable practice

Objectives

1. review literature on the subject
2. interview experts
3. obtain feedback from staff in the one to one interviews from a coal face perspective

Introduction Summary

In order to meet Objective 1 of the Otago Polytechnic Strategic Framework for to develop sustainable practitioners, Otago Polytechnic needs to have the appropriate training and tools to ensure all staff have the skills to effectively meet this objective. It appears that currently this is not the case. The main tools available to Otago Polytechnic staff, ASV and the Efs elective course in the GDTL (formerly the GCTLT), are voluntary in participation and appear to be lacking in aspects of training required to be effective. The aim of this project is to create a plan to achieve this strategic objective to 'develop sustainable practitioners'. This requires curriculum development tools to support their understanding and development.

Research methodology:

To obtain the information required for this project, engagement will be with the staff that need to deliver on the objective of graduating sustainable practitioners, including targeting groups that have completed the ASV and EfS courses as well as experts in the subject.

In summary:

1. Complete literature review
2. Design a questionnaire for staff
3. Test questionnaire on two staff for effectiveness
4. Modify questionnaire accordingly
5. Seek approval to run the questionnaire - Approved Jean Tilleyshort, ethics approval not required.
6. Deploy questionnaire - refer to Appendix B for a copy of the questionnaire
7. Summarise results
8. Provide a summary of the results to participants that indicated they would be involved in further discussion and questions that will form the interview - Refer to Appendix C for interview questions
9. Book appointments for and conduct one on one interview
10. Interview two experts in sustainability - Refer to Appendix D for interview questions used to frame discussion
11. Summarise results
12. Write report and propose recommendations

Tools used

Literature review

Recent literature forms an important part of any research project. It informs the need to complete a research topic, highlights current gaps and can help to recommend or provide evidence for the need for certain actions.

Online survey

Often the staff that are being asked to meet an objective are the ones best placed to suggest answers to a problem. Many of those staff that are placed to help with a solution also won't give an indication there is a problem openly until asked specific questions that help them identify a gap. It was important to include in the sample some staff that have completed the ASV or EfS training, as outlined in the introduction section to help identify whether these should form part of training in their current or in a modified form.

Due to the time constraints on this project and the requirement that participation must be voluntary, it was not possible to seek polytechnic-wide involvement. Staff were approached based on meeting at least one of the following criteria. Academic staff that had:

1. completed ASV.
2. completed the EfS course as part of their teaching certificate
3. not completed any training towards delivering EfS (control)

This survey was made available to all staff, and was voluntary in participation, which reduced response rates. It is likely that the respondents were those that are engaged in trying to meet the objective around graduating sustainable practitioners. It was individually emailed to all participants of the ASV programme from semester 2, 2013 and all previous participants of the EfS course in the past 5 years. The remainder of staff were reached by posting on “Insite”, Otago Polytechnic's intranet.

It would be a useful exercise to interview a group of recent graduates who have in theory had EfS training, to find out what they obtained from their Otago Polytechnic programme that helped them on a path to sustainable practice and if there was additional resources and/or tools that would have met their needs/expectations. Due to the short time frame of this research project this was not possible to achieve at this time, but could become a recommendation following this project.

The data collection started with the online questionnaire that provided a baseline of information to support the hypothesis that staff need more support and training on the subject of graduating sustainable practitioners and to guide the direction of solutions. The demographic information collected in the survey allowed analysis based on who actually responded.

One to one interviews

Following the online questionnaire, one on one interviews were used to follow up with staff that wished to participate by answering follow up questions, which were written from identified information still required following analysis of the online survey results.

The rationale for the follow up interviews is that one of the shortcomings of written/anonymous questionnaires is that once you have the information there is often a desire to drill down into answers further. In addition, baseline information gives a starting point for an interview discussion which therefore increases the richness of information that can be obtained. Enquiring further should increase the value of the data collected and assist with design of solutions. The shortcomings of interviews are the risk of the interviewer leading the interviewee in their answers as well as misinterpretation of an answer by the interviewer.

Expert interviews

In addition 2 expert interviews were carried out to obtain opinions on how they think tertiary institutions are doing in this field and advice on what is needed to progress forward. Both experts interviewed are based in New Zealand and are familiar with the tertiary education sector and Otago Polytechnic and in addition have international experience in the field of EfS. Of course it is understood that expert opinions worldwide vary, and these must be interpreted as individual opinions, but if these opinions are then backed up with other results, such as those of the literature review, this helps to increase their value.

Interpretation of data

Interpretation of data involves looking for trends but recognising that the sample of academic staff responding is potentially biased due to the small sample size and volunteer nature of responses. The trends will help inform the proposed solutions, but further research may be required to make firm decisions.

Summary

By using a wide range of information collection techniques, this maximised the amount of information that could be obtained in the short time period. Data from the different groups of people and from the literature has been compared and used to inform the proposed solution.

Results:

Literature Review summary

Table 2 summarises the key findings from each paper reviewed, how this has contributed to the understanding of the Otago Polytechnic situation and how the FSSD could be used to help Otago Polytechnic take the next steps to achieving their objective of graduating all students as sustainable practitioners.

Table 2: Summary of Literature review

Journal Reference	Key points	Contribution to understanding the Otago Polytechnic situation
Wright and Horst (2013)	There are clear gaps in understanding what sustainability is according to this research	This highlights the need for Otago Polytechnic to provide leadership at all levels in this area so all staff are on the same page. Choosing and using a framework such as the FSSD would provide a solid understanding, language and framework to have conversations and all EfS to move forward.
Krizek et al (2012)	This article details the changes an organisation goes through when implementing sustainable practice from a grassroots concept to a fully integrated campus community.	It is possible to identify the stage Otago Polytechnic is in from those listed. It is at stage 3 - it has the will but not the way yet to navigate to stage 4. It is time now to reduce the silo effect of academic schools and service areas working largely in isolation, understand sustainable systems thinking and the importance of interdisciplinary approach. The FSSD with its common language and systems thinking can help make that transformational change from stage 3, where the will to change is there, to actually making the change and being where it wants to be.

Table 2: Summary of Literature review continued

Journal Reference	Key points	Contribution to understanding the Otago Polytechnic situation
Velazquez et al (2005)	This article highlights the additional challenges of implementing EfS at a tertiary institution over and above those of a standard business.	Otago Polytechnic faces many of the the challenges discussed in this article including being time limited (perceived workloads, as per work environment survey and many overfull programmes) and funding constraints. In addition it highlights the fact that staff are not receiving universal training in the subject, making the facilitation of knowledge and skills to students an ad hoc process. The silo effect, which is also observed at Otago Polytechnic, is highlighted in this article. By using a common language, as used in the FSSD and common tools, this will make conversations between schools and service areas easier to have. This, in addition to providing multidisciplinary problems to solve where schools have to work together, applying the common framework to develop solutions that lead to action competence would be invaluable.
Djordjevic and Cotton (2011)	This article highlighted that significant challenges are identified in communicating messages about sustainability successfully	This is a challenge faced by Otago Polytechnic too. Because there is limited guidance and training to date around definitions and integrating the message, staff are left with varying interpretations that affect how the message is carried forward. The common language and tools in the FSSD is likely to help improve understanding and the sharing of messages.
Barth et al (2007)	Key competencies and the need for interdisciplinary learning are highlighted in this article. No formal list of key competencies are given, however the article states that these need to be developed. Some suggestions include: forward thinking and planning, social and cultural inclusiveness, empathy and being able to work across disciplines.	Barry Law produced the “Inspiring Capability” spiral diagram for Otago Polytechnic, which identifies some of the key competencies that need to be developed in students (and staff too) to move them into this sphere as capable sustainable practitioners. For a student to meet these, it requires real thinking outside the square to develop a graduate of this calibre. Many of the current national programmes are restrictive and do not encourage this side of development, and it is that we use the current national targeted review of all sub degree programmes to do things differently. In addition to this, as has been clear in other articles too, all staff need to have a good understanding of the topic and then need to work across disciplines. Further challenges to the Otago Polytechnic environment is the growing number of off campus students meaning that the campus environment that has played an important role in this education on campus is not a factor that will necessarily influence these students.

Table 2: Summary of Literature review continued

Journal Reference	Key points	Contribution to understanding the Otago Polytechnic situation
Thomas (2004)	This articles acknowledges that tertiary institutions have widely acknowledged the need for EfS to be part of their education programmes but little has changed in terms of curriculum in this time.	All Otago Polytechnic programmes are required to embed this and an upcoming audit is designed to provide the information as to whether this has been achieved. However many schools are delivering National programmes with a prescribed curriculum, which are often overfull. While staff try, they lack time and knowledge on delivery and successful integration of the subject to develop the knowledge and behaviour change with effect. By using the FSSD, it is possible to provide a framework that can embed current content and look at things through the eyes of a sustainable development framework.
Shephard (2008)	This article talks about the importance of affective learning in delivering a sustainable education. This type of learning is not a traditional tertiary learning pathway, partly because of a fear of being seen to be indoctrinating ideas.	Otago Polytechnic pride themselves on experiential learning and affective learning can be fitted into this learning type. As we educate staff better in the subject of EfS to meet the objective of “every graduate is a sustainable practitioner” we need to ensure that discussion on the best way to engage a student in this field is part of that education. This article could be used as a starting point to examine how to embed action competence in this area.
Barth (2013)	This article highlights the important part tertiary institutions play in the role of a EfS. In the article the author highlights the importance of the academic staff in this role.	This article backs up this research project around the support academic staff need in undertaking the role required by the polytechnic of graduating sustainable practitioners. For the academic staff to do this they need to feel confident in what they are facilitating, and understand and use a common language to base discussions, plans and actions. The FSSD would facilitate this.

Online survey

The online survey showed a wide range of knowledge, skills and approaches to EfS. Although responses were only received from a small number of staff, the results still highlighted the need for an integrated polytechnic wide approach to this subject.

17 staff opened the survey, 11 responded to the questions. The respondents were all female, from a range of age groups. The majority (8/11) had been at Otago Polytechnic for 6 years+ and were from a range of staff levels (e.g. Head of School through to lecturers). All except two respondents were all NZ European. One respondent identified as Dutch descent and another identified as both NZ European and Maori. Staff were all based in Dunedin, bar one offsite staff member who responded. Seven academic areas were represented in results. Collecting data in a voluntary manner like this has the potential to create some bias. It is more likely the staff that engaged in this process are already the ones highly engaged in the subject. Regardless of bias, the data collected supports the literature review and the hypothesis that more training of staff is required to enable effective delivery of the objective of graduating sustainable practitioners.

Table 3 - Online survey respondents definitions of sustainability

Respondents definition of sustainability (quoted directly from the survey)
1. Something is sustainable when it can continue for a indeterminable time, without depleting natural resources or being harmful to the environment.
2. Working in a way in which wastage is reduced or eliminated and that the environment is preserved in a way which allows for continuous regeneration
3. Preserving earth and live on it, so that we do not rob future generations.
4. Holistic view point finance, political, social and environmental and how all must be viewed together not just environment
5. Sustainability is the process in creating balance and sustaining something into the future - in either an environmental, economic, social, or governance sense or a combination of the above.
6. Sustainability to me means that we consider the social, environmental and financial well-being in the future of an individual, organisation and environment
7. It is the practice of working as best you can in a way that can be continued and doesn't deplete or damage resources- social, economic, environmental, political.
8. Living in a way that prioritises people over things. Trying not to contribute to the destruction of our planet.
9. Thinking about the future by making lasting and effective changes and practices now
10. It means being connected to hope
11. It is about reducing waste of time and resources by thinking about the impact of my actions as a consumer.

There are many published definitions for sustainability (some examples can be found at: <http://www.sustainablemeasures.com/node/36>). It is evidenced in Table 3 above the wide range of definitions from survey respondents. Definitions 1-3 focus on the environment, 4-7 include the holistic view of sustainability. Definitions 8 - 11 all have slightly differing focusses again. No person in the world knows exactly what sustainability looks like for sure. It is therefore acceptable to debate the definition and understand that individuals have differing views on what it means. However, at some point Otago Polytechnic staff will have to agree to disagree and come up with a universal definition of sustainability so all academic staff are on the same page, when facilitating students. The four system conditions provide a clear definition of what sustainability means (and therefore what unsustainable practice is too) and it also provides an opportunity to audit where we are now and what we need to do to get to a sustainable state.

All respondents were aware of the Otago Polytechnic Sustainability Strategic Framework and the objectives, and all are trying to embed sustainability. 7 out of 11 felt they were doing this with only limited knowledge. The remaining 4 out of 11 felt they had good knowledge. It is hypothesised that this actually underestimates the number of staff that feel they have limited knowledge as the groups that had done some training were individually targeted, therefore would be assumed to have better knowledge. Also because it was voluntary, due to the title of the survey it is likely that the staff that were engaged in this topic were more likely to be drawn to complete the survey.

Table 4 - Response to defining a sustainable practitioner in a specific field by online survey participants

Definition of a 'sustainable practitioner' is in the respondents field (quoted directly from the survey)
A mentor who is passionate about sustainability (must be someone who has bought in - can't just tell someone to be a sustainable practitioner and let them loose), who can holistically embed sustainability in the delivery of education, who can light the way. A sustainable practitioner is not a preacher, but rather a believer.
my field as an educator: helping students to know how to look after themselves as an OT practitioner: managing the future of the profession and practitioners in ways that are connected to.
Someone who is aware of the bigger picture in regards to everything they do today having and impact of the future
A practitioner who operates with limited impact on the outdoors so that they can sustain the environment for others to enjoy into the future. They should also be able to inspire and educate others about the wonders of the outdoor environment and facilitate others to reduce their impact in a ripple type effect.
someone who knows how to support others to achievement and keep yourself sane.
In my field it is someone who has the skills to consider the definition above, but has a strong focus on developing the health and wellbeing of an individual so that they are resilient and live life to the best they are able
A practitioner who does not use unnecessary disposable and /or recyclable resources. A practitioner who assists clients to live a high quality life without preventable illness or admission to health care services
Practice in a way that preserves resources and creating awareness and encouraging critical thinking in students.
A sustainable practitioner in teaching students in health and social services would encourage students to manage their time efficiently and conserve resources such as medical supplies, electricity, and transport.
Promoting sustainability by creating awareness, support and education. Defining the meaning of sustainability - sharing the understanding and reasons for it and why we support it.

One respondent did not answer the question but queried whether you could indeed be sustainable in her particular field, which was a valid comment. This is where a common framework which ensures understanding of sustainability by an agreed definition - e.g. the four system conditions, and auditing against it helps to clarify what this sustainable practitioner might look like and what the situation might need to be like.

From these definitions in table 4, it is clear that there are again lots of differing opinions and from all of them it is difficult to visualise exactly what a sustainable practitioner in a specific employment area would be like. This indicates work is needed in this area.

Table 5 - Staff knowledge in key FSSD tools as recorded by online survey participants

Using the scale provided (1 - 5), where 1 is no knowledge and 5 is excellent knowledge, what is your knowledge of the following:	Number of respondents giving each rating				
	1	2	3	4	5
Knowledge area					
The Natural Step Framework (also known as the FSSD, Framework for Strategic Sustainable Development)	6	1	1	3	0
The Nine Fundamental Human Needs (Max Neef)	2	4	3	1	1
Drivers of change	1	0	5	4	1
Four system conditions	6	1	2	1	1
Strong sustainability model	5	1	2	2	1
ABCD planning model	7	2	1	1	0

From table 5 you can see knowledge is limited across the board in most of these fundamental tools that are used with the FSSD and that are promoted by the Otago Polytechnic Centre for Sustainable Practice (CSP). Knowledge of these concepts does not appear to be directly linked to the training staff have received. Those who have completed the ASV or EfS course do not appear to be significantly more confident in these tools. This could be a case of knowing what they don't know which can lead to reduced ratings, as opposed to blissfully ignorant, which may lead to higher ratings.

Table 6 - Concepts used to underpin EfS used by online survey participants

Concepts	Number of respondents using these
Footprint goal setting www.footprint.org and interpretation	1
Action projects	1
Teaching for sustainability sessions	1
Sustainability presentation topics (in specific courses in one school)	1
Industry case studies	6
Drivers of change	6
The strong sustainability model	1
Multiple industry case studies	3
9 fundamental needs	5
4 system conditions	1
Do not know	1
None	1

Table 6 illustrates that there is little consistency in approach. The potential here is that this is likely to lead to confusion from students who are moving from course to course (within a programme of study). The key is to have a common framework to underpin EfS, across the whole of Otago Polytechnic. Case studies and action projects used to contextualise the common framework.

Table 7 - EfS facilitation methods used by online survey respondents

Method to facilitate EfS	Number of respondents using method
Framework for Strategic Sustainability	1
discuss sustainability in terms of the environment	9
discuss sustainability in terms of people	10
discuss sustainability in terms of culture	7
discuss sustainability in terms of finance	4
discuss sustainability in terms of individuals	10
Blogs	3
Case Studies	4
Problem Solving	5
Facebook page	1
Action Project	1
Interdisciplinary case studies (involving students across schools)	1
nothing	1

It is clear in table 7 that people are discussing a wide range of areas of sustainability - but on reflection this is a weak question because it is unknown what they are discussing against (e.g. is a common framework being used to focus discussion) nor what actions are being taken from the discussions. It is also hypothesised that the survey has encouraged people that are actually doing something to respond therefore there might be representation of more action here than is actually happening across Otago Polytechnic. It is interesting to note that finance is not covered by many of the respondents and the question that falls out of that is how can new graduates influence the businesses they enter if they can't talk the language of business which is the bottom line? This might not be a purist approach to sustainability but it is a duty to give the students the tools to talk sustainability in business which means they need to understand business language, which focusses on the financial bottom line.

Measurement of success

5/7 of the schools that had a staff member respond are using no tools to measure success in this area. One school, which had four respondents, indicated four different methods of measuring success, which were not all the same and one indicated this same school did nothing.

The other methods highlighted include: the use of pre and post delivery surveys; anecdotal evidence; workplace performance after graduation; through open and frank discussion; assessment results.

The results suggest that in general, academic schools at Otago Polytechnic are not measuring success in this area, and the one school that is, the staff are not exactly clear on what they are doing, or potentially each staff member is doing a different thing.

Feedback on ASV

In the online survey there was only one response from a staff member who attended all of the ASV programme facilitated sessions. The feedback was that the framework was very useful but the course overall was overwhelming.

A second respondent indicated attending the introductory session to the ASV before deciding not to continue, and she highlighted that it was good but a bit overfull and a bit too pushy in places. There was no room for discussion and debate. This is a worthwhile comment to take on board so when introductory training is looked at prior to staff considering completing a qualification in the subject, time is dedicated to discussion before presenting a framework to work with.

Due to the sample size limited data prevented conclusions from being drawn.

Feedback on EfS course

Four respondents had completed the EfS course. Answers to the question that was asked about the strengths, weaknesses and areas for improvement were weak. Feedback included over focussed on the environment, opened eyes to the myriad of ways sustainability can be viewed, another respondent felt it helped them develop in this area but its weakness was the lack of other course participants. The fourth respondent did not answer the question.

Again limited data makes it difficult to draw conclusions however it seems clear from this information and that of the overall survey that there is a lack of a framework around delivery of this programme. Implementing the FSSD and using that to inform an action project, may help strengthen this programme.

One to one interviews

Six of the respondents from the online survey indicated that they would be willing to discuss the topic further via a one to one interview. Respondents were sent out a brief summary of results and some questions that came from the survey. The interviews were useful in expanding on information provided in the online survey and to help propose solutions.

In terms of specific challenges respondents had in delivering EfS these included:

- Expressing sustainability in an inherently unsustainable profession.
- Sustainability more around what is the value of the course/programme to the student in terms of employment/community, so the focus is on social/values based sustainability, not the environment so this respondent is unable to see how to connect this.
- Challenge of getting students over their cynicism about it, in addition there is an added caution of making it too complex when first introducing the subject - although this respondent is familiar with The Natural Step tools, she finds they overwhelm students new to the subject.
- The fact that not all staff buy into it and live the values and this creates challenges in then educating the students.
- Challenges integrating sustainability into a skills based course focussed around academic writing.

When asked about what introductory training should be in place for all new Otago Polytechnic staff, ready to deliver on the objective of sustainable practitioners, the responses from the six respondents were very different, though all agreed some introductory training needs to be applied. Ideas put forward for this included: a tour around the polytechnic looking at what people are doing, a compulsory course in the teaching qualification, a half day introduction at induction and compulsory staff training days focussing on the subject.

There were mixed feelings on the introduction of a common language to frame sustainability. Half of the respondents definitely said yes, a fourth said yes for staff training but not to force it to be used to educate the students and two were against it due to too much jargon at the polytechnic already and the process needing to be more organic. Respondents were clear that whatever was used needed to be kept simple.

Overall the feeling was that there shouldn't be another compulsory qualification in this subject but it should be taught by short courses. Part of the rationale behind it not being another compulsory qualification is that people take the attitude of it just being another tick box exercise rather than engaging. Comment was also made that training should be delivered in mixed groups (i.e. not all from one school or service area) as it raises different ideas and thoughts that help people's knowledge grow. One respondent had strong ideas around a recognition system - perhaps like a colours system so that everyone can see who has attained what skills in the polytechnic. This idea appears to be one worth exploring and may be an incentive system to encourage staff participation.

A sustainable practitioner was defined very differently by people in each area (e.g. some consider just the environment, some just the people) in the online survey. Interviewees were then asked if it would be useful to have guidance writing and illustrating these definitions within their area. Most respondents (5/6) were in agreement with this and feel it needs to be driven from polytechnic leadership, as comments arose that there was a gap between the leadership vision and the guidance being provided at the coal face. This theme came up through a number of questions. The respondent who disagreed, and felt that there would be a negative response to this approach, would like more help through mentoring and assistance with integration.

The FSSD is the framework recommended to frame sustainability by the Otago Polytechnic Centre for Sustainable Practice (CSP). However only one of the respondents had heard of it and uses it. This aligns with online survey responses.

Most respondents were keen to see a mentoring system in place, but there were different ideas on how this might look, from using people from other areas, to having a champion in each area, to learning from others and sharing. The respondent who did not like the idea of mentoring felt that mentoring is too hard to implement and therefore would prefer courses. One of the respondents who agreed with mentoring said that structures and outcomes would need to be in place and a time allocation to the mentor to ensure it works. When asked who the mentors should be, responses again varied. Ideas included it needed to be a special type of person that was sensitive to differing ideas, someone from another area and had to be set up so it was followed through.

In the online survey provision of introductory resources was an idea proposed. There was general agreement of some sort of repository available where good resources were tidily filed. Discussion led to the suggestion that someone on the sustainability steering group could manage a Moodle page like this and review resources provided by people and keep the page tidy and easy to find things.

Some good ideas of action competence were detailed by some respondents so it is clear it is happening at Otago Polytechnic. It was unclear though what framing was given beforehand as, for example, only one of these respondents understands FSSD as a tool to allow students to understand and evaluate what they are seeing and then enable them to suggest the change required.

On the topic of integration there were mixed responses to whether it should be integrated only or needs an introduction first. What was clear was that the structure of the programme can change the answer. Staff found it harder to integrate into a National Qualification with unit standards where there is no reference to sustainability, than a locally developed programme that has specific outcomes relating to EfS.

When asked about actions speaking louder than words, it was clear that there is room for improvement in this area. There is still a level of apathy and “that’s not my job” (e.g. keeping campus environment nice by picking up rubbish).

The local food project, being proposed by Dr. Ella Lawton, as a “whole of institution” project to frame sustainability, was well received by all six respondents with some concerns. For example one respondent says that if it mentioned the environment then there would be resistance from staff in that school, as that particular school define it as resilience. This appears to be a problem with understanding sustainability rather than it being insurmountable

Measurement of success was deemed to be a real challenge, though one respondent identified they were doing in-house beginning and end of year surveys this year as a trial. So this could be an option to review. Success after graduation was another area where measurement was needed but no solutions were proposed.

Expert interviews

Two expert interviews were conducted, one with Dr. Chris Eames, Waikato University and the other with Dr. Barry Law, The Sustainability Company. By conducting expert interviews, it was possible to compare what was being reported by staff at the coal face, against the views of experts in the field around what needs to be done to get effective results in delivering EfS and graduating sustainable practitioners.

Dr. Chris Eames

Dr. Chris Eames, an Environmental Educator from Waikato University (**Eames**)

When asked who is doing EfS well and graduating sustainable practitioners, Dr. Eames felt educators are trying but there are challenges. He identified two challenges:

1. That people have a “fuzzy idea” of what sustainability is, and therefore how it is achieved but especially staff in tertiary institutions as they often approach it from only their perspective, and its commonly mentioned in the media. However there are over 300 definitions of sustainability, and no one actually knows what a sustainable world looks like.
2. Many tertiary teachers are not trained as teachers and are not helped to teach, especially in a university where on the job training in terms of learning to teach is common, and academic staff are often learning by doing. EfS has pedagogical ideas that frame it around action competence (**Ministry of Education Education for Sustainability**) which is an approach that is not enacted well.

Dr, Eames also identified that it is essential that EfS should be holistic (environmental/social/economics). But also laid out carefully so people understand it and show how everything is connected and therefore they can't be considered separately. His current research is focused around trying to understand why there is not more of a movement towards sustainability and to identify the barriers. There is a quantum change in behaviour required, compared to how today's adults were brought up.

Dr, Eames was clear that EfS can't be delivered and integrated by everybody without educational opportunities. Education workshops are essential in his opinion for all academics. The institution needs to decide what sustainability means to them - and realise it's not the same for everybody, then work out what Otago Polytechnic's view is. Create the vision which is the first part of action competence - what does Otago Polytechnic look like when it is meeting the Strategic framework for Sustainability? Part of this vision is defining what a sustainable practitioner actually looks like. The next step in Dr. Eames opinion is to educate academics so they understand it, can to deliver it and are able to weave the conversation and build student experiences into the programmes. Dr. Eames was clear that it needed to be integrated, not taught as a separate topic.

Dr. Eames gave an example of an EfS course for educators at Waikato University. The students of this course need to go and get experience in a community by talking to people about issues, research the issues, find the cause of the issue, not just symptoms and solutions and then demonstrate action competence by deciding what to do. This is the same experience students should have. The key is to frame experiences for the students to have.

The interview involved looking at an example specific to the School of Veterinary Nursing at Otago Polytechnic. Using a veterinary clinic reception area as an example, instead of just finding out the function of a reception area and that it's important to keep it clean and tidy, the students need to learn about the area, look at the set-up, the resources used, the lighting, the heating, the products used for cleaning. Then ask them to consider energy more critically and look at the environmental impacts, social impacts (e.g. people need to be comfortable) and the financial aspects (making it more efficient will reduce costs) and then get the students to propose alternatives. The students could work in small groups or as individuals to work through this problem. Dr. Eames said it was important that the same consistent approach was used across the whole of the institution.

Dr Eames spoke about change being a slow process when delivered through education. People need to be conscious of not forcing ideas and consequently turning them off, but of highlighting the issues and having conversations and debate. He felt though at some point regulation will be needed to bring about change and gave a potential example of government regulation on oil use.

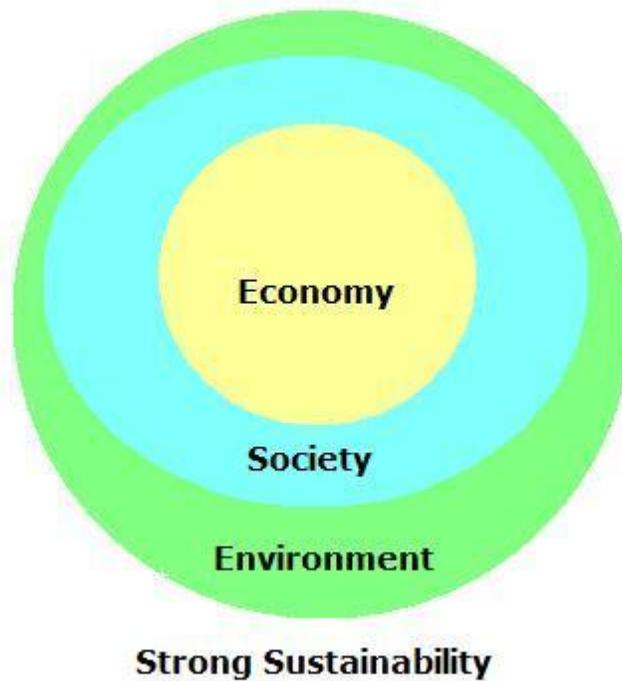
The discussion moved to visioning. Dr. Eames recommended considering doing some visioning for the industry early in the programme of study for students, maybe an introductory course, that includes the consensus view of Otago Polytechnic on what sustainability is (mentioning the multiple definitions) and then looking at how it looks in the specific academic areas. Following on from this, integration of EfS into each course in the programme. Integration should be used as much as possible so it's just part of the normal curriculum.

When asked how he thinks New Zealand universities and polytechnics are delivering this, Dr. Eames felt that not many tertiary institutions are doing well in this area. He said universities are trying to improve in this area and are offering professional development workshops in the area of EfS and how to teach it, but as an example Waikato University are only reaching maybe one percent of staff a year.

Dr. Eames felt Otago Polytechnic were well ahead in the field in New Zealand in terms of sustainable practice commitment, and the fact that this project is being done by an Otago Polytechnic staff member is a measure of the polytechnic's commitment to EfS. Dr. Eames commented that people within tertiary institutions are trying but not in an organised way.

Dr. Eames agreed that sustainability is a contentious issue, but action competence is about being informed so using it can lead students to think about challenges and have informed decision making (similar too ethical debates). For example, in terms of peak oil, present the students with a balanced view (rather than the educator's own opinion) and then get them to go away and make their own decisions. Explain that everyone has different ideas but refer back to the strong sustainability model (figure 4) as a way of integrating, and showing people who may be more focused on economics or the people side the interconnection. From an educational viewpoint people need to buy into it and not be brainwashed, but as mentioned earlier this is not the fastest way for change to happen, and legislation may be required at a government level.

[Figure 4 Strong Sustainability model](#)



Dr. Eames on leadership, agreed that leadership is needed from the top but it needs to filter down and their needs to be an effective monitoring process and guidance to make it happen.

In terms of tools to help with effective EfS delivery, while he said the Natural Step (FSSD) is a little bit corporatised, he felt it was better to talk the language of business and institutions, which is more effective in moving people along the spectrum. Once people are moved along towards more sustainable thinking, it is easier to shift them to the next level on the spectrum.

The primary challenge faced by organisations in this space, according to Dr Eames is a lack of knowledge. The use of an impact matrix is important to understand which changes will have the biggest impacts and be of highest importance. [Review an impacts matrix here](#) (Slide 11).

Dr. Barry Law

Dr. Barry Law is the Director of The Sustainability Company and is a consultant employed by Otago Polytechnic helping to implement sustainable practice across that institution.

Dr. Law started the interview by highlighting how important holistic education, across the institution, is in this space. It is also important to show cross institutional perspectives on sustainability, otherwise the perspective is too narrow. Students need to understand the environmental, economic and social aspects of sustainability, but it's also about changing behaviour and time needs to be spent on this.

When asked who is doing EfS well, Dr. Law mentioned the Waikato University Business School, and that the Christchurch College of Education was great before it amalgamated with the University of Canterbury. In terms of Otago Polytechnic he felt they have a basic understanding of sustainability but it's not a big enough connection to change community behaviour. He believes there needs to be a change to the business to make the behaviour change.

Business is a key and Dr. Law feels there is still a lot of work to be done in breaking down barriers between employers and employees. Businesses that are doing well in this space are those that have an open platform to share ideas. It is important that tertiary institutions are training people to contribute in the workforce. Another important factor is training the workforce to listen to and accept new ideas from new graduates, rather than dismissing them, and providing support and mentoring for them. According to Dr. Law, this is backed up by lots of evidence that new graduates don't last in business because the business is not run on ethical standards.

In terms of delivering EfS, Dr. Law recommends giving students a look at a wide variety of businesses to see different perspectives of sustainability and what change or sustainability might mean to those businesses – this helps them get a broader understanding of issues including inequity and the need for social justice. In addition they also need to understand basic science too. If they don't understand the water cycle, carbon cycle, and nitrogen cycle then they will find it difficult to follow. Students need to understand this and the concept that we only have one planet with one set of finite resources.

Dr Law feels that at Otago Polytechnic there is currently a gap between the institution's values and its behaviour. Sustainability is a complex notion and it is important to have people who really understand it. To do this Dr. Law says more professional development is required as staff at Otago Polytechnic currently teach sustainability from their own perspective, rather than around the concept of sustainable practice.

In terms of qualifications, and courses within them, learning outcomes must include sustainable practice and assessment must follow through from that, says Dr Law. Experiential learning is required for people to really connect with it.

Dr Law says the New Zealand curriculum has future-focus themes (sustainability, globalization, values, behaviours) in front of qualifications but it is not actually being done, so he questions, "if that's important why isn't it driving the curriculum?".

Graduating a Sustainable Practitioner – From new student to sustainable practitioner – the educators role
By Dr. Francesca Matthews, B.V.Sc., B.Sc., NDAET

Educational excellence and sustainable practitioners are Otago Polytechnic's values but in many cases this is not being achieved, according to Dr. Law. It was also noted that there is a need to look at how EfS is integrated through all our qualifications at a national level. Dr. Law used the example of builders and architects who are not getting jobs because they are not trained in sustainable practices - so we must be doing this to graduate work-ready employees.

In terms of education of the academics, an emphasis on the 'why' in New Zealand is still needed (unlike Europe where this isn't required because they get it). Academic staff need to understand the systems thinking approach – one planet, set resources (there are no more) and too many people. Dr. Law says that currently education is doing this backwards – thinking of cost first and making profit before impact on people and environment is taken into account. Dr. Law says academics also need to know how to change business and make our students marketable.

Dr Law highlighted that New Zealand markets itself as “clean, green and 100% Pure” so its a major issue if we are not addressing sustainability in our graduates. This needs to be in the learning outcomes of all qualifications, not just in overarching principles. We also need to live our own values in NZ. An example of this is water quality – the health and safety of everyone relies on a healthy planet. There is a tendency to look at cost factors as just the purchase price, not including the costs of maintenance or replacement/disposal costs, so if we bought the better version that lasted longer this may create significant savings. Businesses need to look at the long term cost. Dr Law gave an example of purchasing a shredder. In a company he helped they produced lots of confidential documents so shredding facilities were essential. They were continually buying cheaper portable ones, which had a limited life, and were still having to send some documents to a commercial document destruction service. However when they analysed spending over time, they purchased a heavy duty second hand shredder that ended up saving the company thousands in the long term, even though the initial outlay was higher. There was also less waste from broken shredders going to landfill. It is essential to learn to look at the long term cost including environmental impacts, social costs on time and effort, and monetary costs when making decisions.

There is a complexity in preparing staff to teach sustainable practice. Dr. Law suggests maybe undertaking co-teaching for a while – a sustainability expert and the subject expert that understands the profession and can help tie it together. This will also help academic staff grow their understanding and confidence.

Prior to this Dr. Law says that staff need understand base knowledge: What is sustainability?, What does it mean to the institution and in relation to New Zealand?. Staff need to understand the issues for NZ then look at the profession and issues within it.

The other side of the coin, according to Dr. Law, is that it is essential to drive professions to make the change in the education. Many businesses are trying to maintain business as usual that won't work. It is only once they change they will demand a different graduate. To be in business today and ignore sustainability is a problem. There are major social and environmental issues going forward.

Future-focused, sustainable businesses are operating well above compliance. However, compliance is something that is put in place once a major problem has been realised, so it's at the bottom of the cliff. Education takes us back to top of the cliff. Businesses need to be engineered to work way beyond compliance, thus reducing compliance costs. In addition stronger penalties need to be put on non-compliance as in some cases businesses earn so much that they can afford to be non-compliant and pay the penalties.

When asked about the difficulty of delivering national qualifications that omit this subject in the learning outcomes, Dr. Law suggested this is just a case of a marketing tool, putting a value on the additional education they will receive at Otago Polytechnic.

Finally Dr. Law reiterated that there must be a strong process for training the staff at Otago Polytechnic and that these staff must buy into it. There needs to be strong accountability to reach the full potential of the Sustainability Strategic Framework.

Discussion:

The literature review (refer to Table 2) very much supports that Otago Polytechnic are on the right track with regards to the Sustainability Strategic Framework and embedding sustainable practice. The missing steps that are really preventing Otago Polytechnic from progressing to the next level is leadership at all levels and the universal training of staff. The literature suggests this is important and because of the widely varying views around this subject, after some initial discussion, it is recommended that a common framework, such as the FSSD, is used to frame all discussions and action plans. The use of a common framework is supported by the literature.

The other key finding from the literature review is that action is important. Once the staff and students have a framework and knowledge to work with, they need to be demonstrating action competence.

Interviews carried out with Dr. Chris Eames of Waikato University and Dr. Barry Law of The Sustainability Company confirmed this need for structured training for all staff and also highlighted the need for action competence to be part of this training and an important part of the tools the staff use with students. A significant behaviour change is required too.

The literature review highlights the importance of working across schools and service areas on multidisciplinary case studies. There is little evidence of this currently being done at Otago Polytechnic. This is unsurprising as staff are battling with time and financial pressures as well as overloaded programmes. Academic staff do not yet have adequate support and training to help them understand the big picture around EfS and graduating sustainable practitioners. This needs to be in place first, before bigger projects like multidisciplinary case studies and action projects are undertaken.

Results from the online survey and one to one interviews, while only completed by a small number of staff, backed up the hypothesis of this project. Staff need more leadership, support and training to deliver on objective one of the Strategic Framework for sustainability - graduating sustainable practitioners. Effective measurement tools also need to be implemented to review success in this objective, as this is currently not being done. Without effective measurement tools it is impossible to know if what is being done is actually effective.

Definition of a ‘sustainable practitioner’ graduated from Otago Polytechnic

Quoted from Nelson Switzer, President and Chief Sustainability Officer of Asherleaf Consulting Inc., a multi-disciplinary sustainability advisory firm based in Toronto, Canada. (<http://asherleaf.com/2011/08/399/>)
“A sustainability practitioner understands the interactions between environmental, social, cultural, economic and governance issues and how each fits into the corporate mission and strategy. The sustainability practitioner knows how to help a company enhance its corporate value – that means helping the company grow and protect its profit and share price while helping it preserve and protect natural and social capital.”

At Otago Polytechnic we are graduating work ready graduates. Our graduates are in most cases going out into the world of business and in that world the language is profit margins. The corporate definition above therefore provides a good basis for a definition of Otago Polytechnic graduates when meeting objective 1.

A sustainable practitioner that understands and is using the four system conditions may think like this:

System condition 1: In order to adhere to this system condition, sustainable practitioners recognise that nature should not be subject to systematically increasing concentrations of substances extracted from the earth's crust. To do this they need to understand the basic science, as indicated by Dr. Barry Law. These are primarily finite resources, that are non-renewable within our society's time frames. It is also about understanding, for example, that if mercury is extracted then it must not be deposited into nature at a concentration higher than what is natural. CO₂ and climate change also sit under system condition 1. If we are putting more CO₂ into the atmosphere than what naturally occur, we are upsetting the carbon-cycle balance.

Examples include: Use of fossil fuels - transport, power, includes transporting of products to business, products that are byproducts of fossil fuels, mineral products - such as phosphate and lime through to precious gems - depending on their business. Sustainable practitioners will work to find solutions to reduce reliance on substances extracted from the earth's crust.

System condition 2: In order to adhere to this system condition, non-natural substances should not escape into the environment because nature cannot break them down. Therefore if they are not kept in closed loops they should not be created in the first place. Sustainable practitioners would select products or develop their own that do not have a negative impact on the environment during production and/or following their use. For example, selecting disinfection/cleaning products with no environmental impact or ensuring that if they do have an impact they are not released into the environment.

System condition 3: In order to adhere to this system condition, sustainable practitioners ensure that products and services they use are not part of the cycle of systematically degrading the environment, both up and downstream from when they handle it. For example, sustainable practitioners will select paper sourced from a sustainable forest (e.g. FSC - forest stewardship council) to ensure that no more areas are being deforested for the production of paper and ensure the paper is appropriately recycled at the end of its life. It must also be considered in relation to how quickly the system replenishes the product., for example, in sustainable forestry it is essential to also consider the impact of mono-cultures on biodiversity. In reference any product, but using paper as an example, should reduce use, reuse the product you do use and recycle it and then choose FSC.

The same goes for palm oil products, corn products and any others that are produced on ever increasing areas of land being deforested. As well as deforestation, waterways are being degraded by the production of many products too.

System condition 4: In order to adhere to this system condition, sustainable practitioners will be able to practice in such a way that the people they work with or those they source products from have no barrier to meeting their needs. **(Max Neef - Fundamental Human needs).**

Why is using the FSSD the answer

The table below shows how the FSSD can help in developing a common language, and provide tools for implementing sustainable practice.

Table 8 - How the FSSD can help
 Refer to Figure 1 for diagram of five levels of the FSSD

Criteria for a sustainable practitioner	How the FSSD can help	Tools*
Understand why they personally need to develop as sustainable practitioners	Systems level - understand the drivers for change	SWOT analysis Nine fundamental human needs Funnel metaphor ABCD planning model
Be able to define what sustainability actually is	Systems level - provides a definition using the four system conditions. This can then be audited against to show where we are now.	Strong sustainability model and Audit against the 4 system conditions ABCD planning model Cradle to cradle Biomimicry Life cycle assessment Ecological footprinting
Be able to visualise what success is	Success level - the four system conditions provide a method of developing a vision	Using the audit, students (and staff) can look at what it would look like when the system conditions are not being violated. ABCD planning model
Be able to prioritise actions	Strategic level - be able to identify actions required to get from baseline to vision, set goals including a communication and engagement plan and prioritise actions	Impacts and importance graph, goal setting with timeframes ABCD planning model 3 strategic prioritising questions
Take action	Actions level - undertake action competence	Actually demonstrate doing something to progress the vision using milestones and checklists .

*The 5th level of the FSSD is the tools and these need to be applied at each level

Proposed Strategic Plan and Estimated Budget

In table 9, a proposed strategic plan is outlined. It is known that there is urgency from Otago Polytechnic leadership to deliver on the objective of graduating sustainable practitioners, so the proposed timeline for staff training is short and ambitious.

The key findings from the research were that all tertiary institutions, including Otago Polytechnic, need to take immediate action in this area. It also identified a need for leadership at all levels, universal training and mentoring. Responses were mixed on using a common framework, but the literature review and half the responding staff supported a common framework for discussion and setting up and reviewing action. Table 9 also includes a column to show how the results support the proposal.

As can be seen in table 9, each aspect of the proposed strategic plan meets the SMART tool:

- Specific
- Measurable/motivational
- Aggressive yet attainable
- Relevant
- Time bound

The focus of the strategic plan is system condition 4 – enabling people to meet their needs. Staff need to have the knowledge and framework with which to deliver on a key performance indicator which is graduating sustainable practitioners. Obtaining this training and undertaking and overseeing action projects should then see improvements in actions when it comes to the remaining system conditions.

Table 9 - Proposed Strategic plan with timeframe and estimated costs

	Details	How results/discussion support this	Timeframe	Estimated cost
1. Present to Jean Tilleyshort/leadership team	Engage support from leadership team to implement this strategic plan	Whole purpose of the project was to put a proposal to Jean Tilleyshort and the leadership team.	August 2014	
2. Run some staff forums	This is to allow this project and proposed outcomes to be presented for discussion/further ideas - being inclusive.	Staff need to feel included - inclusion will improve engagement and uptake	Sept 2014	
3. Agree on common language and framework	This will include a definition for sustainability and what a sustainable practitioner actually looks like. The FSSD is the framework recommended in this research and by the Otago Polytechnic Centre for Sustainable Practice. It is therefore the framework recommended for Otago Polytechnic as a whole to adopt.	The literature is clear that there is a need to provide a framework to deliver EfS around, and since the CSP prefer the FSSD as a framework this would be the obvious one for Otago Polytechnic to use.	Sept 2014	
4. Review and revise graduate profiles for a sustainable practitioner document	Refer to Appendix E - This document is complex and therefore difficult to engage with. It needs to be simplified, so it is less overwhelming and is measurable. Refer Appendix F - for draft suggested revision	While this document was not presented to respondees, information gathered about what staff are facilitating around EfS, does not appear to be in line with this document.	October 2014	7 hours work @ \$50 per hour - \$350*
5. Communicate progress	Update staff on plan to implement universal EfS education - progress report, opportunity for feedback. Ensure staff are aware this is not a campaign to remove personal opinion but a way to frame the subject holistically like any ethical debate, where tutors personal opinions can be placed on the continuum as part of discussions.	The literature review highlighted the importance of ongoing and clear communication	Oct 2014 and repeat at least monthly	

*all costs should be centrally funded or consider external funding application to AKO Aotearoa or similar

Table 9 - Proposed Strategic plan with timeframe and estimated costs continued

	Details	How results/discussion support this	Timeframe	Estimated cost
6. Identify suitable initial mentors	<p>One mentor per school or service area. Depending on numbers of identified mentors, some mentors may need to assist in more than 1 area.</p> <p>Define their role, allocate time to allow this, so it isn't on top of current workload and define KPI's for mentor roles.</p> <p>Some ideas:</p> <ul style="list-style-type: none"> • Mentors meet with other mentors, to ensure similar broad approach to mentoring • Mentors meet with assigned school or service area at least once a month to help with developing knowledge on the language and implementation. • The mentor may also help in delivery of the introductory resources and action projects for the first year or two while the staff get really familiar • Mentors will help the school continue on the journey of developing a sustainable vision for the school, selection of appropriate case studies and action projects and so forth. <p>The mentor project is likely to be a short term requirement (2-3 years) as staff get up skilled and confident, however the benefits of cross school communication through this means may mean this is a project that should continue for a longer period.</p>	<p>Academic staff responding to the survey/undertaking interviews were overall in favour of a mentor system, but were clear this needs to be done in a way to make it effective. Allocated time for the mentor and KPI's would appear essential to this working.</p>	<p>Nov 2014</p>	<p>1 mentor per school/service area 2 hours per week @\$50 for 1 year then review</p> <p>If 20 schools/service areas \$100/week per area \$2000/week x 41 weeks (academic year) \$82,000*</p>

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Table 9 - Proposed Strategic plan with timeframe and estimated costs continued

	Details	How results/discussion support this	Timeframe	Estimated cost
7.Development/ and or sourcing of introductory resources to assist staff to expand their knowledge and introduce the topic and common language to students and create a common repository for them	<p>A moodle course will be provided, where all staff are students to access the resources</p> <p>A staff member, perhaps from the sustainability steering group, will be assigned a role to receive potential resources, evaluate and upload in an easy to access manner. Time will be allocated to that person role to undertake this.</p> <p>The resources will include templates of the tools, examples of the tools in use, good references (e.g. links to videos and suggested uses) and case studies to refer to. They will then be able to be contextualised for the specific programme. Opportunity for anyone who has suitable resources to share them here.</p>	<p>Academic staff undertaking the interviews were in favour of a central repository for resources. Again it was highlighted this needed to be managed well to be effective.</p>	<p>Feb 2015 - initial course and resources available to coincide with start of training</p>	<p>Time resources allocated to person maintaining moodle course 2 hours per week \$50/hr \$100/week x 41 weeks Annual cost \$4100*</p> <p>Review time allocation after 1 year and potentially reduce</p>

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Table 9 - Proposed Strategic plan with timeframe and estimated costs continued

	Details	How results/discussion support this	Timeframe	Estimated cost
<p>8. Provide training to staff in common language and framework</p>	<p>Three 2 hour training courses and an action competence project are suggested:</p> <ol style="list-style-type: none"> 1. Discussion about what sustainability means to the individual (validating personal values and opinions), what it means to Otago Polytechnic and what it means to graduate a sustainable practitioner from Otago Polytechnic. The aim is to validate personal opinions, and then to build understanding of the holistic and connected view taken by Otago Polytechnic and the expectation of this being facilitated to students. Liken it to an ethical continuum - giving a broad and balanced view of the whole situation where it's up to students to place themselves on that continuum. 2. Introduction to the common language to frame discussions, including examples of it being used. Make it inclusive so people can see how their personal ideas can be fitted into it and evaluated. Get staff to evaluate some they do personally using the framework - to bring it back to the individual. 3. Embedding EfS in their area - focussing on how to embed EfS in a specific subject area. This would be referred back to how it fits into the framework. 4. Action competence project - each staff member to take a small area of their work area or industry and complete an action competence project which is to include implementation wherever possible. This not only helps staff get the concept, but will set in motion sustainability improvements all over the polytechnic. <p>It is suggested that initially, for speed of implementation for the bulk of staff, that the first workshop is delivered at the Jan/Feb development day The second is delivered late term 1/early term 2 and the third in the July staff development day. The action project is completed by all staff in semester 2. Action projects can be supervised by designated mentors</p> <p>Once the bulk of staff are trained, the first two workshops can form part of the induction at Otago Polytechnic, the third be run several times a year to pick up new staff and then they can be assigned a mentor to guide in completing the action project.</p> <p>These workshops can be facilitated by staff at Otago Polytechnic already well versed in the FSSD.</p>	<p>While academic staff responses to using a common framework were mixed, the literature review supported this, as does the Centre for Sustainable Practice. The fear with common frameworks is often that it will remove individual opinion and this may have swayed results.</p> <p>Results were clear that to get traction on this quickly, Otago Polytechnic need to take big bold steps</p>	<p>Feb - July 2015 for part 1,2 and 3</p> <p>For Action project (part 4) - July - Nov 2015</p>	<p>Costs for facilitators</p> <ol style="list-style-type: none"> 1. Overall course coordinator Estimate 2 2. Facilitators Dependent on how this is delivered - based on dividing staff into 10 groups on staff planning day 10 facilitators x 6 hours face to face and 3 hours prep time 10x 9 hours x \$50 = \$4500* in first year <p>Costs for staff out of normal jobs for 6 hours + time to complete action project est 10 hours = cost neutral by making the 6 hours staff development days and making the 10 hour project part of staff development but over and above individual professional development days.</p>

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Table 9 - Proposed Strategic plan with timeframe and estimated costs continued

	Details	How results/discussion support this	Timeframe	Estimated cost
9. Development of school vision for a sustainable practitioner	Once initial training above is complete, using the Otago Polytechnic definition of a sustainable practitioner, develop (or revise if there already is one) a written definition of what a sustainable practitioner in the specific field is. FSSD trained mentors should be provided to enable this to be facilitated effectively. It is also suggested that having an illustration of what a hypothetical sustainable practitioner or the industry might look like. Refer to Appendix F for an example	Staff interviewed agreed overall that it would be useful to have a clear school or service area vision. Post training when staff are on the same page would be the best time to do this.	July - Nov 2015 (Semester 2)	Part of mentors role - already costed above Illustration costs: Est \$400 per school*
10. New staff training	Once the majority of staff are trained in the common language and framework, then it is suggested that a development day once a semester or on demand is run to get new staff up to speed on the language of the FSSD. All academic and general staff should have access to this training	This is the follow up training for staff not yet with Otago Polytechnic, who will miss the staff upskilling.		Ongoing cost Estimate each course run twice a year 12 hours face to face + 6 hours prep time (12+6)x\$50 = \$900*
11. Gaining a qualification	A qualification in this subject should not be compulsory but it is recommended that at least two staff from each school or service area develop their knowledge and skills in this further by undertaking the ASV programme or Graduate Diploma in Sustainable Practice.	Staff were clear that an additional qualification should not be introduced and there did not appear to be any other supporting evidence. The ASV extends knowledge of the FSSD and would appear to be an ideal programme, as it already exists to for sustainability leaders in any area to obtain a qualification in the area of sustainability.		

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Table 9 - Proposed Strategic plan with timeframe and estimated costs continued

	Details	How results/discussion support this	Timeframe	Estimated cost
12. Development and implementation of successful measurement tools	<p>To measure success in this topic a pre-study baseline survey of students, followed by an end of programme survey, followed up by those same students asked a year into the workplace would provide good evidence of success.</p> <p>Rather than blanket surveying every student, it would be useful to target survey certain groups and use the results and what education they were involved in around EfS to inform continuing improvement in the implementation across the polytechnic</p>	Measurement of success is essential in order to reflect on and evaluate the tools being used.	Ready for use Feb 2015	Needs costing: Development of tools: ??* Deployment: ?? Summary of data: ??*
13. Develop consultancy services to other education institutions	<p>Tertiary education has to go this way - this is supported in literature and at high level government policy. Students in primary and secondary education now expect it and employers are starting to expect it too.</p> <p>As sector leaders Otago Polytechnic will be uniquely placed to offer consultancy services to other education providers both in New Zealand and worldwide</p>		2016?	Net income

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Three prioritising questions

As part of setting a strategic plan, the three prioritising questions should be addressed.

1. Is this moving you toward or away from your sustainability vision?
2. Is this a flexible platform to support future actions toward your sustainability vision?
3. Will this offer an adequate return on investment?

Table 10 – reviewing the three prioritising questions

Key (answer to three prioritising questions)	Definite yes	Yes, but not as high priority, if some things have to give	Not now or maybe re-evaluate later
	Move towards vision?	Flexible platform?	Return on investment?
1. Present to Jean Tilleyshort/leadership team	Vision is not yet being met. Jean Tilleyshort and the Leadership Team are seen to be integral in enabling all staff to engage to get traction	The whole proposal revolves around enabling staff through a compulsory scheme being implemented monitored and supported	Investment so far is authors time, completing a compulsory project
2. Run some staff forums	It will move towards the vision but will slow the movement, however staff will feel more included and therefore more engaged so trade-off	Not all staff find it easy to engage in this manner, but process will be slowed too much but engaging with every staff member. Assumption made those who want to say something will.	
3. Agree on common language and framework	By having a common language it allows conversations to happen between staff and students in same and across different parts of the institution.	The plan supports the use of the FSSD to frame discussions and EfS. It does not dictate learning or outcomes. Staff and students alike are just framing their learning using the same tools. This allows for straightforward inclusion of new knowledge, new research, new legal requirements and so forth around the topic of sustainability to be introduced without changing the framework.	All resources needed are already in use through the Centre for Sustainable Practice at Otago Polytechnic
4. Review and revise graduate profiles for a sustainable practitioner document	Provides a reference document – makes it clear exactly the expectations at each level for graduates.	Can be updated annually with ease, however if it is written well, referring to things that won't change, then little or no change is likely to be required, except tweaks to ensure usability	Unlikely to be used by majority of staff, probably only those developing programmes, however minimal investment required to produce this

Table 10 – reviewing the three prioritising questions continued

	Move towards vision?	Flexible platform?	Return on investment?
5. Communicate progress/plan throughout implementation process	Staff must be informed clearly at every step what is happening and how it affects them. This keeps them in the loop and when done well on the required pathway.	How this will be rolled out has not yet been proposed in the strategic plan but it will be done in a way that it meets staff needs, and could be delivered in numerous ways.	Will depend on the plan. Needs to be effective in getting message across but also in terms of cost effectiveness
6. Identify suitable initial mentors	Well chosen mentors, who are motivated to do the role will increase speed towards the vision.	Mentors can be changed or no longer used if the process is not working	Reasonable investment required if this is to be done well – mentors must be allocated time and key performance indicators to perform this role.
7. Development/ and or sourcing of introductory resources to assist staff to expand their knowledge and introduce the topic and common language to students and create a common repository for them	It can be overwhelming find resources needed – by keeping them in a central well organised repository this will enable staff to access what they need, quickly and easily, without everyone looking independently for similar resources, or designing their own because they can't find what they need	Will be able to changed and updated as required	Reduce time spent searching for resources, minimal financial input. Gives more time for staff to invest in education of sustainable practitioners.
8. Provide training to staff in common language and framework	Quality universal staff training is non-negotiable in terms of effectively meeting the vision	Most of the resources needed to deliver the proposed plan exist, and just need to be packaged accordingly. Exactly how the education is rolled out once the learning outcomes are identified can be easily modified	Effective realisation of the vision, will grow the reputation of the institution and the students will come, employers will send people and come for their own upskilling. The investment shown in table 9 for this outcome is minimal compared to the potential benefits. There are considerable social, environmental and probably political benefits to this
9. Development of school vision for a sustainable practitioner	Helps staff in a school and service areas visualize exactly what they are trying to achieve and provides a vision for students as they embark on their own sustainability journey..	Needs to be reviewed regularly – may need someone driving this to ensure it happens	Written visions can be reviewed annually, with little costs/time, illustrated visions that need updating incur a cost

Table 10 – reviewing the three prioritising questions continued

	Move towards vision?	Flexible platform?	Return on investment?
10. New staff training	Staff training is the only way to move us consistently towards the vision	The way it is delivered can easily be modified to fit the needs of the staff.	Staff that understand and buy into sustainability will be able to deliver the objective of graduating sustainable practitioners.
11. Gaining a qualification	Looks good on paper to have more staff carrying sustainability qualifications	The proposed programmes – either ASV or Graduate Diploma in Sustainable practice provide flexible platforms to present and action projects that meet the needs of the staff member enrolling	Would be completed as part of staff IDP, so on zero fees scheme.
12. Development and implementation of successful measurement tools	When developed these should allow regular refinement of tools and training to continue to deliver EfS and graduate sustainable practitioners, which is essential moving towards the vision.	Tools not developed yet, but they allow the flexible platform proposed to be modified annually to ensure it stays up or ahead of here it needs to be.	Actual costs not recorded, but minimal investment for value in providing results that improve what the institution offers, and provides data for marketing purposes
13. Develop consultancy services to other education institutions	Once the institution is meeting its objectives, the opportunities to implement elsewhere using the same plan are potentially huge. This enables the institution to not only realize its vision locally, but nationally and potentially internationally.	Same flexible platform that is used above – easily modified to meet the needs of the institution in question	Opportunities for excellent return on all aspects of sustainability

As can be seen in table 9 and 10, most of these planned priorities are short term and give strong moves towards the vision, a flexible platform and good return. Those highlighted orange, are ones that could potentially have a lower impact so if something had to give, initially these would be the ones, and then reviewed for introduction at a later date.

Conclusion

By engaging with the staff that have undertaken some or all of the current training available and providing a control group for comparison, this project identified that academic staff are not currently in a position to be able to facilitate EfS consistently and confidently in the space of graduating sustainable practitioners. The literature review supported the research theory in that without effective leadership at all levels and universal effective training and support for academic staff, progress on EfS and graduating sustainable practitioners will be limited.

Discussion with the 2 experts, Dr. Chris Eames and Dr. Barry Law highlighted the same points: the importance of universal and effective training of staff is in order to enable an education provider to deliver EfS and graduate sustainable practitioners. What was also highlighted by these experts is the gap in current National Qualifications around future focussed education. To enable effective assessment and education of EfS, learning outcomes need to include future focussed language. The current Targeted Review of Qualifications (TROQ) for level 2-6 National programmes is an opportunity to ensure that learning outcomes actually reflect the Ministry of Education values and requirements.

The recommendations for Leadership Team consideration and approval are:

1. Provide an effective training and education programme for staff to enable them to be working towards graduating sustainable practitioners goal using the same tools including action competence
2. Provide effective leadership at all levels on this subject to ensure effective implementation
3. Work with the New Zealand Qualifications Authority (NZQA) and Industry Training Organisations (ITO's) where National Qualifications are used and any other relevant standards setting body, to ensure learning outcomes are written to allow effective implementation of EfS and assessment using action competence.

Otago Polytechnic are positioned to continue to be leaders in this field, provided they up the ante when it comes to providing more support and education of staff. This should be prioritised over the next 12 months to exponentially increase our effectiveness in this area and meet key objectives as stated in the Sustainability Strategic Framework.

Once we can demonstrate we are really delivering in this space (both in personal and polytechnic actions and in education) we are positioned to provide consultancy services and mentorships to every other tertiary education provider nationally and potentially primary and secondary education providers too, as well as international opportunities to be explored.

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Appendix A

Full literature review

There are clear gaps in understanding what sustainability is according to this research. **Wright and Horst (2013)** completed a study that part of a larger Pan-Canadian project that investigates various Canadian university stakeholders' (faculty leaders, administration, students and facilities management directors) understandings of sustainable development, sustainable universities and the role the university can play in creating a sustainable future. The study reveals that university department leaders agree on key issues of financial and enrolment issues but opinions vary when it comes to sustainable development and understanding around this was inconsistent. There was some consensus that tertiary institutions should play a role in sustainability but how that looks varies considerably and there were no thoughts that matched the vision that Otago Polytechnic have that every Graduate is a sustainable practitioner. There was a feeling that more leadership was required to lead an institution in the desired direction. This study highlights the gaps in understanding of sustainability and highlights the fact that approach is important in getting staff at an institution on board. This research project, around how do we best educate the educators has the potential to meet that need.

There are a series of phases that each involve good leadership, that a tertiary institution goes through in moving from an institution that does not recognise and integrate this subject, to one that is high performing in this area.

Krizek et al (2012) identified that these phases include:

- First phase: grassroots movement - groups within the institution start to promote the subject of sustainability.
- Second phase: executive acceptance of the business case for sustainability - this appears to relate primarily to campus sustainability (eg energy efficiency) rather than a holistic approach that includes EfS.
- Third phase: is the visionary campus leader who can lead the change. They openly promote a sustainability vision. This leader also elevates sustainability experts to the executive level, which is exactly what has happened at Otago Polytechnic. However, **Krizek et al (2012)** state that this leader has significant challenges including siloed academic departments, the fact that sustainability systems thinking and the interdisciplinary approach is at odds with the traditional academic culture.
- Fourth phase: the fully integrated campus community where the educational experience is coherent inside and outside the classroom. The students learn about sustainability in all majors and they observe and learn from the campus which physically models sustainability's principles and practices. There is systems-thinking and interdisciplinary cooperation in all campus departments. Sustainability operations, student activities, and community partnerships are coordinated, coherent, and high quality. This fourth phase could be used to highlight what the vision is for Otago Polytechnic when they are meeting the objectives of the sustainability strategic framework.

Among other things, Kizek et al recommend feeding off professional memberships/organizations that promote sustainability especially within education, to provide invaluable resources . They also recommend fostering an environment of innovation and creativity. This is something Otago polytechnic is currently leading the way on. This makes people feel good about themselves and when the work they have done is connected helps a wider range of people feel better. This also translates into increased productivity, innovation, and individual leadership.

It is possible to track the progress of Otago Polytechnic through these phases. Otago Polytechnic would currently be sitting in phase 3. One of the challenges being grappled with in phase 3, is effective EfS to meet the objective of graduating sustainable practitioners, which is the purpose of this research project. This article repeatedly mentions systems thinking which is a core concept of sustainability, but has not yet been clearly embedded into the education of academic staff at Otago polytechnic. The FSSD provides a framework for systems thinking that could be used at Otago Polytechnic. .

Implementing EfS at a tertiary institution faces additional pressures over and above those of a standard business, according to **Velazquez et al (2005)**. The problems highlighted include: lack of awareness, interest and involvement, organizational structure, lack of funding, lack of support from institution administrators (includes leadership teams), lack of time which affects formal planning, evaluation and reporting processes. Time is also a constraint to add sustainability issues to usually dense curriculum because professors find it very difficult to teach more subjects in the same period of time. It also highlights the fact that few educators are being taught how to teach about sustainability, most of them are learning in an ad hoc way leading to mistakes being made. In terms of Otago Polytechnic there is no doubt staff are aware and have the interest to want to be involved, however factors of time and the fact they are not universally taught how to teach about sustainability and embed it into core curriculum are the limiting factors. **Velazquez et al (2005)** also highlight the silo effect, reducing the effectiveness of communication and spread of information.

Significant challenges are identified in communicating messages about sustainability successfully. **Djordjevic and Cotton (2011)** used a case study of a new (post-1992) university in the UK, and investigated the ways in which sustainability issues were communicated with staff across the institution, and any barriers encountered. The 4 key themes identified in terms of challenges in communicating messages about sustainability successfully are:

- the contested definition of sustainability
- conflict with university mission
- resistance to change
- needs and expectations of staff members

While Otago Polytechnic have put in place a sustainability framework with four objectives, there does not appear to have been a discussion and subsequent agreement on what definition Otago Polytechnic has settled on. The FSSD, which uses the four system conditions to both help define what sustainability is and also to allow us to audit against them to get a baseline of where we are at, would provide a solution. Otago Polytechnic's mission statement is clear however the needs and expectations of staff around training and provision of resources and support in this area have largely been left unattended to.

The lack of an agreed definition or shared understanding of sustainability, and also to potential individual differences in values and attitudes may act as a perceptual filter of the message. This is a small scale project so the authors recommend treating the findings with caution however they also mention that there is a lack of previous research in this area, so this is a good starting point for highlighting challenges and finding solutions. The article highlights the potential problems of the attitudes of both the sender and the receiver of information which can influence understanding and action. It also highlights that the way the message and knowledge is delivered must be done using effective communication. It highlights problems of communicating the message from management to staff and also institution to students.

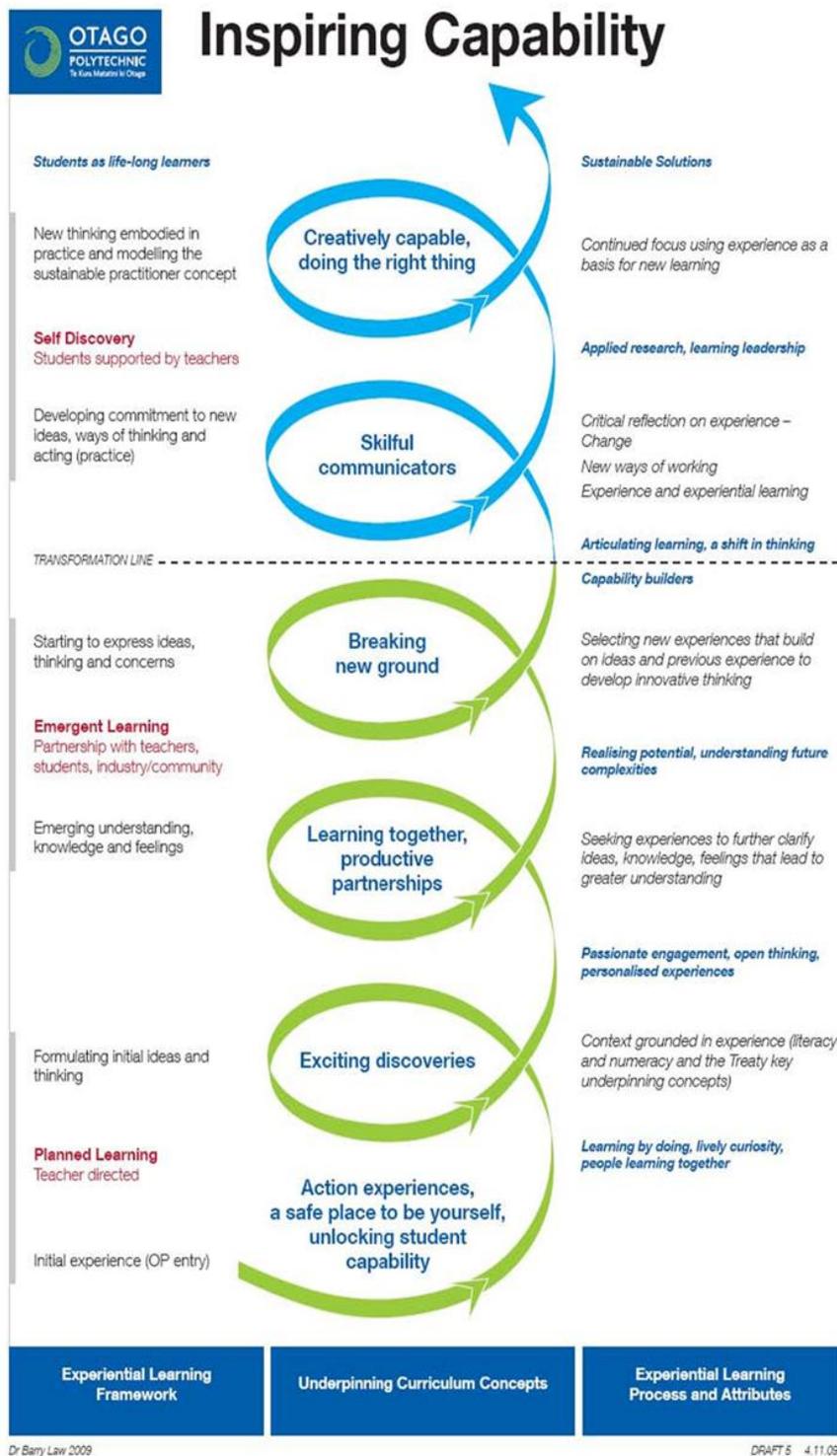
There was some discussion about changes in behaviours that had been observed. These were small changes however, not transformational changes. In terms of Otago Polytechnic, which is looking for transformational changes it highlights even more the requirements to really get the communication and training right. This article supports the need to clearly define sustainability. The 4 system conditions within the FSSD has the ability to do this clearly and allow it to be used to take the knowledge forward too.

The final important point was that the message needs to be contextualised and staff need to be engaged in the dialogue to ensure engagement in the subject, rather than a top down approach. This gives rise to thoughts that any training and education offered needs to be contextualised to the needs of the person/groups involved and the participants need to be involved in experiential learning. This is an important consideration moving forward with a training solution plan.

Key competencies and the need to interdisciplinary learning are highlighted by **Barth et al (2007)**. They looked at the possibilities of both formal and informal learning and their relationship to competence development within higher education. The article states that “ no agreement exists about what (key) competencies actually are, which are of importance and how the approach of competence acquisition finds its way into higher education.” This highlights the need to identify the key competencies in this space. Some examples of key competencies were recorded and they included competencies around forward thinking and planning, but also around social and cultural inclusiveness and empathy and also being able to work across disciplines - active participation by competent citizens.

Otago Polytechnic has a diagram developed by Barry Law (Figure 5) that does identify some key competencies that lead to sustainable thinking. This project needs to use this diagram to look at how we can develop those capabilities and the steps we need to take to get that transformational change of academics and graduates. However, the diagram omits the tools required to frame the experiential learning. This project aims to address this.

Figure 5 - Inspiring capability diagram, Dr. Barry Law



Barth el (2007) talks about key competencies being learnable but not teachable. It was about breaking through established patterns of action and leading to a re-evaluation of action possibilities. Because these competencies and approaches to these complex problems are often interdisciplinary - there is a need for interdisciplinary cooperation which is a foreign concept to the traditional way most tertiary institutions work. Informal learning is an important part of developing competencies in this area, however institutions need to create space and opportunities for this to happen. On top of traditional academic subject material, sustainability has aspects of personal development, ethical considerations and of the individual taking responsibility. The authors believe the question still remains of how formal and informal learning can be systematically related to each other. This article highlights thinking on how to best deliver EfS to graduate a sustainable practitioner. This must be answered to develop a quality set of training and tools for academics delivering EfS to graduate sustainable practitioners. This articles highlights the fact that traditional approaches are not the way to approach this subject.

Support for the concepts of environmental education and education for sustainability have been acknowledged by many tertiary institutions for over a decade and many institutions have signed agreements to educate students in this field, regardless of discipline however a recent survey finds that little has changed in the curriculums at these institutions to include this education for sustainability according to **Thomas (2004)**. Anecdotal evidence is that this is mirrored at Otago Polytechnic

The article reviews the pros and cons of separate vs integrated sustainability education and the conclusion seems to be that it needs to be both, so that the concepts can be taught outside the core curricula but that students can see the concepts integrated into their field of learning.

The author indicates that while resources for teaching education for sustainability are widely available, academics' limited knowledge of the availability of the materials, how to use them, and why their engagement with sustainability education is important may be key limiting factors. For Otago Polytechnic, this highlights the opportunity to make use of currently available resources, but they need training to use them effectively.

There is also a suggestion of institutional issues inhibiting curriculum change. In summary the article states that the reasons for lack of *“implementation are a culture, where value or priority is given to greening/sustainability; lack of organisational and resource support for staff; lack of training for academic staff.”*

At Otago Polytechnic while we have a fantastic vision and supportive leadership team we too lack the deep culture of change and knowledge on this subject, have only recently seen increasing resource support and still lack compulsory academic staff training.

Affective learning which relates to values, attitudes and behaviours and involves the learner emotionally and cognitive learning relates more to knowledge and its application. Affective learning has not formed the traditional learning pathway at tertiary institutions, which have traditionally focused on cognitive learning. Affective learning requires a student *“to display a commitment to principled practice on a day-to-day basis, alongside a willingness to revise judgment and change behaviour in the light of new evidence”*. **Shephard (2008)** states that affective learning is what is required when educating for sustainability.

The article discusses the concern of higher educators around affective learning and not wanting to be accused of indoctrinating ideas. The challenge is to deliver the theory and underpinning knowledge and the values without judging personal opinion. Shephard also states that “knowing how to perform sustainably, and having the skills to do so, are not on their own sufficient to ensure that individual and group behaviours are in fact sustainable”. This is supported in Otago Polytechnic's vision that it is recognised that having the knowledge and skills does mean the student will practice as a sustainable practitioner. Shephard reviews a number of tools that are effective for affective learning outcomes. These include: *“discussion, open debate, peer involvement, role playing, problem-based learning, engaging with role models, simulations, games, group analysis of case studies, expert engagement, perspective sharing via reflection, appropriate use of multimedia to trigger responses”*. The article also states the following activities are useful for affective outcomes *“community service and service learning; religious and spiritual activities; leadership education; diversity education; peer advising and leadership; disciplinary and judicial programs; participation in student governance organizations and activities; recreational coaching, refereeing, and judging; student activities programming; and travel”*. At Otago Polytechnic many of these are being encouraged more and more as part of the student experience. The author has reviewed literature that looks at the assessing of affective outcomes, which has been challenging. The recommendation is to be open and transparent about it in learning outcomes and reward accordingly. This is important knowledge when it comes to considering how to deliver EfS in a curriculum. The information in this article is helpful in considering how to train an academic staff member to successfully embed EfS into a curriculum, however prior to this deep knowledge and commitment to what they are embedding is required. The outcome for staff and students should be action competence.

Tertiary institutions play an increasingly important part in the shift towards a sustainable future. **Barth (2013)** reviewed papers that indicated pointed to this. Across all the case studies reviewed, the following patterns emerged, each of which had a unique list of influencing factors:

- student-led change from informal to formal learning;
- sustainability as a concern in campus operation; and
- sustainability as a unique selling-point.

At Otago Polytechnic it has definitely been the third factor that has driven change. The polytechnic has won awards for this vision but the challenge remains to deliver now.

Barth stated that “to ensure the commitment of all internal stakeholders without overwhelming them, episodes of change and consolidation within the organisation are made sequentially.” Measurability is also important. Barth states that strong leadership and supportive systems are required for this top down approach of sustainability as a unique selling-point. Barth also stated that sustainability is a fragile process and needs strong stakeholder support. He states that *“academic staff play a crucial role in constituting the status necessary to sustain activities that may be started by different groups”*. This shows that staff needed to be adequately supported to do this, so in the top down approach that has been employed at Otago polytechnic, the right support networks and training need to be in place to ensure that Otago Polytechnic's sustainability objectives can be met.

Appendix B:

Questions staff asked in anonymous survey

1. I have read the Participant Information form and consent form attached to the email/survey request and I agree to take part in this project under the conditions set out in the Information Sheet. If you check no, please do not continue with the survey as your answers will not be able to be used to inform the research.
2. Which academic school are you associated with at Otago Polytechnic?
3. Which of the following describes your primary role?
4. Are you: Male/Female
5. What is your age group? 20 – 29, 30 – 39, 40 – 49, 50 – 59, 60+
6. What is your ethnicity? NZ European/Maori/Pacifica/Asian/other - please state
7. What is your length of service at Otago Polytechnic? less than 1 year; 1-3 years, 4-6 years, 7-9 years, 10 years+
8. Where are you based? Dunedin/Cromwell/Auckland/Hamilton/home office/other
9. What is your knowledge of the Otago Polytechnic Strategic Framework for Sustainability, in reference to Objective 1: To develop sustainable practitioners
 - a. Unaware it exists
 - b. Aware of its existence but yet to implement
 - c. Aware of its existence, implementing what I can with limited knowledge
 - d. Aware of its existence, implementing with good knowledge
10. In one sentence, record your own definition of what sustainability means to you?
11. In a maximum of 2 sentences, define what you believe to be a 'sustainable practitioner' is in your field?
12. Using the scale provided (1 - 5), where 1 is no knowledge and 5 is excellent knowledge, what is your knowledge of the following:
 - a. The Natural Step Framework (also known as the FSSD, Framework for Strategic Sustainable Development)
 - b. The Nine Fundamental Human Needs
 - c. Drivers for change and using the funnel metaphor to demonstrate these
 - d. The 4 System Conditions
 - e. Strong sustainability
 - f. The ABCD Planning Framework
13. What concepts do you teach to underpin delivering EfS to meet the objective of developing sustainable practitioners
 - a. None
 - b. The Nine Fundamental Human Needs
 - c. Drivers of change
 - d. The Four System Conditions
 - e. The strong sustainability model
 - f. ABCD Planning Framework
 - g. Industry case studies
 - h. Cross industry case studies
 - i. Other - provide details

14. What methods do you currently employ to deliver Education for Sustainability (EfS)?
 - a. Nothing
 - b. Introduce The Natural Step Framework, as a common language
 - c. Discuss the concepts of sustainability in terms of the environment
 - d. Discuss the concepts of sustainability in terms of the people
 - e. Discuss the concepts of sustainability in cultural terms
 - f. Discuss the concepts of sustainability in terms of the finance system
 - g. Discuss the concepts of sustainability in terms of governance
 - h. Discuss what sustainability means to individuals
 - i. Separate lecture slots on the topic of sustainability
 - j. Integrated facilitation within other courses within the programme
 - k. Blog posts
 - l. Case studies
 - m. Setting students problems to solve
 - n. Use interdisciplinary case studies and involve students from other schools to problem solve
 - o. Other - please state
15. What tools are you using to measure your success in terms of the Otago Polytechnic Strategic Framework for Sustainability, in reference to the objective: To develop sustainable practitioners?
 - a. Nothing
 - b. Pre and post-delivery surveys of students
 - c. Assessment results
 - d. Workplace performance after graduation
 - e. Other - provide details
16. Answer this question if you have participated in the Add Sustainable Value (ASV) course. a. Identify whether it helped you meet the Otago Polytechnic Strategic Framework for Sustainability, in reference to objective 1: To develop sustainable practitioners.
 - a. Strengths:
 - b. Weaknesses:
 - c. Opportunities for improvement:
17. Answer this question if you have participated in Education for Sustainability (EfS) course - a. Identify whether it helped you meet the Otago Polytechnic Strategic Framework for Sustainability, in reference to objective 1: To develop sustainable practitioners.
 - a. Strengths:
 - b. Weaknesses:
 - c. Opportunities for improvement:
18. What other training have you had to enable you to embed EfS and assist you in effectively training sustainable practitioners?
19. What other training or mentoring would you like to access to enable you to embed EfS and effectively train sustainable practitioners?
20. Please take the opportunity to record any further feedback or comments related to this subject

21. Following on from this survey; once the results are summarised I would then like to give you an opportunity to provide further feedback and solutions using a group forum or a one-to-one interview. Please indicate if you would like to be involved in giving further feedback which will help improve the value of the results obtained.
- a. No thanks
 - b. Yes, in a forum setting (eg: Lync conference call or Adobe Connect) – please provide your email address to ensure you are sent details of forum (this will be kept confidential and not linked to your answers above)
 - c. yes, in a one to one interview. please provide your email address to ensure you are sent details of forum (this will be kept confidential and not linked to your answers above)
22. If you have answered yes above, please provide your email address here. Your email address will not be associated in anyway with the information you provided in this survey. Everything will be reported anonymously.

Appendix C

Questions for one to one interviews with survey participants

The following questions have arisen from the survey results. I would like to use these to focus our one-to-one interview. If you are interested a brief summary of the questionnaire results, they are provided (without interpretation) on the next page.

The aim of the following interview is to expand and clarify information received from the online questionnaire and provide further feedback with regards to how we best move forward in this space.

Thank you for your time.

Delivering EfS

1. What are the specific challenges you have integrating sustainability into your courses/programs?

Training and support for academic staff

2. Introductory training
 - a. What introductory training should be in place for all new OP staff, to get them onto the same page - ready to deliver on the objective of sustainable practitioners?
 - b. Should a common language be introduced to frame sustainability discussions and education?
3. Should there be a compulsory course in educating to graduate sustainable practitioners within the Teaching Dip, a separate qualification like the Cert Te Mata a Ao Maori, or just a series of workshops unrelated to teaching qual/obtaining a separate qualification.
4. "What is a sustainable practitioner" was defined very differently for each area and people considered different aspects of the wider definition of sustainability (e.g. some just environment, some just people).
 - a. Would it be useful to have guidance writing and illustrating these definitions within your department / in teams?
 - b. Should you define a 'sustainable practitioner' before or after learning a common language for sustainability?
 - c. If you are aware of the FSSD, would this be a suitable common language?
5. Mentoring has been suggested to assist staff to better implement the vision of a sustainable practitioner.
 - a. What form should this take?
 - b. At what time should mentoring be implemented – before or after initial training, or perhaps in lieu of any initial training?
 - c. Who would you consider as good mentors? (I don't necessarily want names, but the type of people)

Delivering EfS to Graduate sustainable practitioners

6. There have been some suggestions in the online survey that staff would like of introductory resources to be provided in setting the scene for EfS that will be embedded in each course that could be provided to begin the student's journeys.
 - a. Do you agree/disagree – why?

Graduating a Sustainable Practitioner – From new student to sustainable practitioner – the educators role

By Dr. Francesca Matthews, B.V.Sc., B.Sc., NDAET

b. If we had these resources what would you envisage they looked like?

7. Action competence is an important part of education for sustainability. (<http://efs.tki.org.nz/EfS-in-the-curriculum/Taking-action/Action-competence>)

- a. What would action competence be in your field
- b. What action competence do you currently use?
- c. What are the current challenges/barriers in your existing programmes of exercising action competence? How could these challenges/barriers be mitigated?
- d. How could you use action competence in your programmes in the future?

8. Most respondents are doing introductory lectures on sustainability then integrating sustainability into their courses. Others are doing one or the other.

- a. Can you integrate EfS without the introduction? Why/why not?
- b. Is the introduction alone enough? Why/why not?
- c. If there is not an introduction, what should be in the introduction?
- d. What are you doing when EfS is integrated into traditional courses?

Walking the talk

9. It is well known that people copy what they see, more than what they hear.

- a. What do you undertake within your school to demonstrate 'walking the sustainable practice talk' for students and colleagues, over and above the formal education experience: E.g.:
 - rubbish minimization,
 - power saving - lights,
 - computers and other power users,
 - recycling, composting,
 - class materials selection from suitable sources,
 - class materials selection from suitable sources,
 - sustainable transportation options - for class trips,
 - support and encourage sustainable transportation options - for staff,
- b. What more do you think you/Otago Polytechnic could do in this space?

10. An option to encourage more engagement in sustainable practice at OP is to hold a 'whole-of-institution' project in 2015. This would provide for a common vision and common language. The project would provide a context upon which to base projects and integrate EfS.

The proposed project is 'Local Food'. Local food is the current buzz with broad reaching social, economic, environmental and cultural benefits. So why don't we use the buzz and explore it in more detail? Comparing local food systems to conventional systems provides a fantastic setting upon which to highlight sustainable practices. It is proposed that the 'local food' theme can be applied in a project setting, to every teaching area of OP; that at a minimum, at some stage during 2015, 'local food' would be used as a context for one project within every course at OP. This 'whole-of-institution' project would encourage each school to explore sustainable practice through the lens of local food and its relevance to each programme. It is the aim that the project focus will help schools to highlight the connection between their current teaching and EfS.

Measuring our success in meeting the objective – every graduate is a sustainable practitioner.

11. What is 'success' in the objective of graduating sustainable practitioners?

12. How should we measure success in this space?

Appendix D

Questions asked to Experts

1. In your opinion how should organizations train and support staff to deliver education for sustainability that leads to graduating students that are sustainable practitioners in their own fields?
2. How do you think NZ universities and polytechnics are delivering this?
3. Who is doing this best right now and why do you think they are doing it best?
 - What leadership is required to make it effective?
 - What tools are effective for these people/organisations doing it well? And what is it about it about these tools that makes them effective?
4. What are the primary challenges faced by organisations in this space in your opinion?

Appendix E

Current Expectations - Graduate Profile Sustainable practitioner

Table 11 - Graduate Profiles for a Sustainable Practitioner - written 2008

Aspect of Sustainability	Level 3 Graduate will:	Level 4 Graduate will:	Level 5 Graduate will:	Level 6 Graduate will:	Level 7 Graduate will:
<p>Systems Thinking: -scope of sustainability, relationships, history, definitions -actions will have impacts + & -, intended and unintended, across scales, temporal, spatial, social -relationships (hierarchies, partnerships) humans a part of nature</p>	<p>-understand the definition and history of sustainable practice -have the ability to judge their actions according to impacts on the environment over time and across systems</p>	<p>-have a broad knowledge base of sustainability including definitions, history, and relationships -analyse the impacts of their actions on ecosystems with the knowledge that humans are a part of nature</p>	<p>-have in-depth understanding of the relationships, definitions and history of sustainability -be able to analyse and evaluate the cultural, social, economic and environmental impacts, + & -, intended and unintended, from their actions</p>	<p>-be able to analyse and evaluate the many definitions of sustainability as well as the history and relationships of the sustainability movement - critically analyse the impacts of their actions across scales of time, space and social contexts and formulate appropriate responses to social, economic and environmental sustainability issues</p>	<p>-have technical knowledge of and the skills to analyse, evaluate and participate in research in sustainability - critically analyse and evaluate complex relationships in nature to evaluate the cultural, social, economic and environmental impact of their actions across time and systems</p>

Table 11 - Graduate Profiles for a Sustainable Practitioner - written 2008

Aspect of Sustainability	Level 3 Graduate will:	Level 4 Graduate will:	Level 5 Graduate will:	Level 6 Graduate will:	Level 7 Graduate will:
Ethics etc: -ethics, justice, culture, law, social, govnmnt frameworks, -roles of values, cultural beliefs -individual and community involvement as important components	-have the ability to identify, understand and adopt values conducive to sustainability	-understand and be able to work within government frameworks and laws guiding sustainable practice -be able to critically analyse their values and beliefs and those of society in the context of sustainability	-understand the laws and ethics guiding sustainable practice and apply these in a number of contexts	-have in-depth knowledge of the ethical, legal, social and cultural values and beliefs that guide action for sustainability	-thoroughly consider ethical, legal, social and cultural values and beliefs in the creation of appropriate responses to abstract problems in the sustainability of our social, economic and natural environments
Evaluating Practice and Change: -change management -precautionary principle -participation -methods of decision making -micro/macro ecological signals -democratic process -self evaluation, personal and professional	-work with others to evaluate their work in terms of sustainable practice -follow procedures to suggest or initiate change towards more sustainable practice	-develop a high level of self reflection, personally and professionally -initiate change to more sustainable practice within their job description, under general guidance	-participate and take some responsibility for decision making and change to a more sustainable model	-evaluate the individual and community components of sustainable practice and manage processes to achieve a group goal -analyse and evaluate personal & professional practices & be accountable in implementing change strategies	-plan, resource and manage a democratic process to make changes to more sustainable practice

Table 11 - Graduate Profiles for a Sustainable Practitioner - written 2008

Aspect of Sustainability	Level 3 Graduate will:	Level 4 Graduate will:	Level 5 Graduate will:	Level 6 Graduate will:	Level 7 Graduate will:
Earth Functioning / Basic Science: -ecosystems -natural laws governing functions -interdependence / holism -biological diversity - carrying capacity	-understand the interdependence of the earth's natural systems and the importance of biodiversity	-understand the basic science of how the earth's natural systems function and have some technical skill to apply the theory	- ability to explore and evaluate ecosystems cyclic nature and the natural laws guiding their function	-have a wide range of specialised knowledge in some areas of the natural laws governing the functioning of ecosystems	-have the ability to research and analyse practices and evaluate how they fit into the natural laws governing ecosystem function
Sustainable Strategies, Basic Approaches (the toolkit): -technical, scientific, behavioural strategies (4 system conditions) -SBN auditing topics -renewable energy -pollution, waste -industrial ecology	-use their judgement to make changes with a basic understanding of some environmental solutions	-has a broad knowledge base of sustainable strategies and can implement them within their job description, under guidance	-analyse and apply a range of environmental solutions in a variety of contexts	-applies technical, scientific and behavioural solution strategies to a wide range of environmental problems within a context	-have the ability to apply advanced technical skills, as well as scientific and behavioural solutions to complex dynamic environmental problems in a number of contexts

Appendix F

Draft of suggested revised Graduate Profiles of a Sustainable Practitioner by level

This could still be simplified further to make it a functional set of outcomes for graduates, understood by academic staff, students, graduates and their future employers.

Table 12 - Draft of suggested revised Graduate Profiles of a Sustainable Practitioner by level

Aspect of Sustainability	Level 3 Graduate will:	Level 4 Graduate will do everything in level 3 and:	Level 5 Graduate will do everything in level 3 and 4 and :	Level 6 Graduate will do everything in level 3,4 and 5 and:	Level 7 Graduate will do everything in level 3,4,5 and 6 and:
Systems Thinking including: Earth Functioning / Basic Science	<p>Understand: One planet, fixed resources</p> <p>Understand 9 fundamental human needs - reflect on sustenance requiring healthy environment</p> <p>Understand the definition of sustainability used by OP - the Four system conditions</p> <p>Introduced to the concept of biodiversity and how systems are all interlinked</p>	<p>Understand the interconnections between the environment, people and economics using the strong sustainability model</p> <p>Build knowledge of basic systems and the pressures on them - water cycle, nitrogen cycle, carbon cycle, as well as social inequity and understand how that relates to sustainability</p> <p>Introduce drivers of change as a way to illustrate the reason we need to change</p>	<p>Introduce FSSD, how the previous tools fit and the remaining tools</p> <p>ability to explore and evaluate ecosystems cyclic nature and the natural laws guiding their function</p>	<p>Show higher level understanding of the FSSD and how to apply it to a complex problem</p>	

Table 12 - Draft of suggested revised Graduate Profiles of a Sustainable Practitioner by level

Aspect of Sustainability	Level 3 Graduate will:	Level 4 Graduate will do everything in level 3 and:	Level 5 Graduate will do everything in level 3 and 4 and :	Level 6 Graduate will do everything in level 3,4 and 5 and:	Level 7 Graduate will do everything in level 3,4,5 and 6 and:
Social Practices: ethics, legal requirement (eg national and local laws and Acts), individual, cultural and community needs	Identify, understand and begin to adopt values conducive to sustainability	Be able to analyse their values and beliefs and those of society in the context of sustainability.	Understand the laws and ethics guiding sustainable practice, critically evaluate them	Have in-depth knowledge of the ethical, legal, social and cultural values and beliefs that guide action for sustainability and critically evaluate them	
The language of business	Understand that we include financial sustainability in the definition but without a healthy environment this will collapse	Understand how the financial system currently drives society and how improving environment and social sustainability can improve the profit	Understand that the language of business is money and profit. Include in the action project how you would frame your suggested actions to a business owner	Frame questions like: How can you keep doing what you are doing? What are the risks - key to successful engagement when talking to business leaders. Be able to present to the business owner a case for change	
Action projects - all require students to Identify, evaluate and reflect at all levels	Work individually or in a group to evaluate their own individual actions in terms of social, financial and environmental impacts and identify ways to reduce impacts	Undertake an action project in a specific area in their field of study and evaluate actions in terms of social, financial and environmental impacts and identify ways to reduce impacts	Be able to use the FSSD to undertake and report on an action project related to area of study	Action project should include a complex multidisciplinary problem, working with students from other areas of study (internally or externally)	Action project should include a complex multidisciplinary problem and implement change

Appendix G

A Vision of a sustainable integrated animal care facility and veterinary practice



This image shows a multifunctional facility including: veterinary clinic, groomers, doggy daycare, boarding facility for cats, dogs and small mammals and a cafe (which allows pets). It also includes community facilities such as dog walking area, community garden, memorial garden and a meeting room that can be hired to community groups. It is designed to be a community focus for the companion animal loving people in a given community.



This vision of a multi-functional animal care facility including a veterinary clinic is sustainable because it is:

- Cyclic - This facility produces zero waste.
- Solar - power is provided by photovoltaic panels and wind power
- Safe - all chemicals are environmentally safe at all stages from production to disposal, the working practices also look after the safety of the employees. Products are checked to be sourced from sustainable sources for example paper, to avoid further degradation of the environment.
- Social - this facility provides a family friendly work place, it is

inclusive of all employees in decision making, all employees have the option to purchase shares, working hours are in place that suit individual requirements. It provides spaces for staff, the clients and the community to meet formally (eg meeting room which is available for booking by staff, clients and the community as a whole) and informally (eg the cafe, community garden, dog exercise space and the memorial garden). Fairtrade products are used wherever possible.

- Affordable - the multi-use facility which incorporates several smaller businesses working together provides efficiencies in use of space, energy and sharing resources. It also has the ability to draw in members of the community to spend more time at the facility so this contributes to them spending discretionary cash at the facility (eg coffee and dog treats) rather than at a megastore that is not owned locally. These all help to reduce overheads and therefore reduce costs to clients.
- Efficient - efficient use of space, sharing resources, renewable energy, working smarter (reduced working hours - for example 8.30 - 5.30 + one late night and a Saturday morning once a month rather than 7am - 8pm Monday to Sunday as an extreme example but packing more in for example) allow the facility to function very efficiently.