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PROJECT-BASED LEARNING VIA STRATEGIC OBJECTIVES
FOR SUSTAINABLE PRACTICE

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INTRODUCTION

Otago Polytechnic (OP) has long had a focus on sustainability and uses the United Nations Sustainable Development Goals (UN SDGs) as our sustainability framework (United Nations, 2021). The polytechnic aims to embed sustainability in all that we do (Matthews, 2014). Our Sustainable Practice Strategic Framework supports the development of students as sustainable practitioners and graduates who are sought after in the labour market (Otago Polytechnic, 2013).

Joint postgraduate and undergraduate applied management classes at Otago Polytechnic Auckland International Campus (OPAIC) used experiential learning and workshopping to create a project-based learning product underpinned by back-casting sessions.

This report is based on research from an internship project focused on campus sustainability initiatives at OPAIC. The work-based learning project investigated sustainable practice, chiefly in an applied management undergraduate paper, from a student experiential learning perspective in Term 1, 2022. Key insights and findings are discussed and summarised here.

The research asked the question, how can experiential learning activities advance the progression of sustainable initiatives at OPAIC campus? Four simple, open-ended questions were used to analyse student perceptions relating to the research question, with an aim of continuous, quality improvement towards delivery in subsequent terms. A Learning and Teaching template was used to embed sustainability and experiential learning for international students. Three workshop types are reviewed in this paper: Wānanga Kairangahau (WK), Sustainability Industry Open Day (SIOD) and Campus Sustainability Workshops (CSW).

Fundamental to the project was the re-examination of what our Strategic Objectives for Sustainable Practice (SOSP) (Mann, 2011) mean contextually for the campus, in terms of climate action in a “new world of work” (Schwarz, 2021). These strategic objectives form an actionable foundation for sustainability initiatives on campus and mandate OPAIC:

- to develop sustainable practitioners
- to model evidence-based sustainable practice in our operations
- to encourage communities and businesses to embed sustainable practice
- to ensure that our actions benefit our communities.

An intensive effort to re-activate the Strategic Objectives for Sustainable Practice on campus in 2021 actuated seven different campus sustainability initiatives in each of five blocks. The year culminated with OPAIC joining the Green Office Movement, the first tertiary campus in New Zealand to do so. Already in 2022, more students

are involved in sustainability on our campus; focused work on campus sustainability projects is underway. Seven campus sustainability initiatives are developing sustainable practitioner capability to instigate student climate action on campus.

Climate action is now an imperative for organisations (Naviza et al., 2021). Our OPAIC campus is home to both international students and staff; it is as almost as diverse as Auckland itself. Our joint applied management cohort examined what sustainable practice means in a campus whose vision is “to develop New Zealand’s most employable graduates” (Otago Polytechnic Auckland International Campus, 2022) via student discussion, reflection and reflexivity.

Students created a novel project-based learning product, deciding to advance all four Strategic Objectives for Sustainable Practice as a linear process, using tools of continual improvement. The intention is that students and staff evolve as sustainable practitioners in any field of study in their learning journey. Students can leverage structured, student-centred learning and teaching opportunities which blur the lines of work and teaching and learning. The processes created can empower students as capable sustainable practitioners in chosen fields, adding value to organisations, businesses and communities.

PROJECT OVERVIEW

Following two terms of pandemic lockdown at the end of 2021, it transpired that block one of 2022 would also be off-campus, delivered via the Microsoft Teams platform. To make learning engaging and contemporary, a weekly, term-wise system was created, honed and templated for several applied management cohorts, to further embed sustainability in all that we do. The first session each week focused on applied theory, experientially delivered, relevant for the paper. The second session was tutorial-like; topical issues, tools and scholarship were discussed to elevate a culture of contemporary learning. The learning template structure is set out in Figure 1.

1. Karakia / Whakataukū	8. Review and Reflect
2. Calendar / Learning Plan	9. Mahi tahi / Karakia
3. Today in the News	10. Management Tools
4. Applied Management Focus	11. Sustainability / SOSP
5. Topic of the Week	12. Project-based Learning
6. In Communications	13. Homework step-by-step
7. Nascent Research	14. Mātauranga kia Mārama

Figure 1. Refined learning and teaching template: applied management.

Point 11 in the learning and teaching template ensured a focus on sustainability, yet embedded sustainability could be and often was highlighted within any topic in the template. The template has clarified that our campus embeds sustainable practice in learning, for every paper. A dramatic cultural shift has occurred from 2021, when staff and students essentially implied that sustainability was a separate topic or paper. In 2022, students are including sustainability and embedding the concept in their assessment and project work; in fairness, this tends to happen more often where lecturers are ‘up to speed’ with their own sustainable practice capabilities.

The template also supported constancy and evidentiary communications, with streamlined presentations that entrenched experiential groupwork and diverse perspectives; it could be used to bullet-point student experiential learning insights. Also, an end-of-term product was created by students to reimagine a process of SOSP evolution for any class in any department, by term.

To do 'more with less' and avoid burnout, the 14-point template was honed to deliver contemporary content, lift capabilities and embed sustainability; a basic bicultural focus was instituted. Undergraduate classes utilised the 14 points as weekly content; postgraduate classes supplemented tutorial sessions with the template, contextualising technical topical delivery. At an international campus, a closer alignment to the culture in Aotearoa New Zealand was established. News articles and debate topics were reflected on experientially. Management tools and frameworks were used to embed sustainability in all activities (Matthews, 2014). The Strategic Objectives for Sustainable Practice and their expression were discussed.

Elements of the template were used for Campus Sustainability Workshops (CSW) and vice versa, to reinforce learning. The workshops continued even though teaching was online. Classes were combined in a progression of 'working lunches.' Exclusive events, launches and webinars proved opportune. The Sustainable Business Network was particularly useful, serving to merge many relevant topics for debate and assessment depth and breadth, to support development of sustainable practitioners and operations on our campus. Our innovative project-based learning product encapsulated the learning and teaching. It was similar to a real employment internship.

RESEARCH METHOD

The research question was: how can experiential learning activities advance the progression of sustainable initiatives at OPAIC campus? Four simple, open-ended questions were used for efficacy and perceptive insights. OPAIC uses embedded sustainability in all learning and teaching and has a focus on experiential learning styles and practices. Work-based learning insights were collated and summarised, and three types of workshops are reviewed in this paper.

The research methodology was derived from primary qualitative feedback, collected through query and a series of questionnaires. A cohort of 13 undergraduate and 14 postgraduate applied management students consented to be included in a summative research project on sustainability initiatives. The open-ended questions were purposely simplistic, intended to be refined for efficacy and continual improvement purposes (ethics approval AIC85). Open-ended questions (paraphrased here) simply asked about an initiative: what students liked, what might be improved, what was learned and how initiatives might support their future. Along with experiential learning comment, many insights, commonalities and improvement ideas were collated. Nineteen of 27 students submitted questionnaires, reviewed for perceived efficacy on:

Wānanga Kairangahau – Student Researcher Workshops (WK): hybrid sessions, as a process to support student research co-publication in journals and conferences.

Campus Sustainability Workshops (CSW): hybrid delivery of nascent topics in sustainability, expressly relevant for sustainable practice and recent campus projects.

Sustainability Industry Open Day (SIOD): different from Student Researcher Workshops, as they emphasise embedded sustainability and applied industry-focused research.

The open-ended efficacy questions were based on student value-based perceptions. Students had several days to respond after each initiative. As well, in-depth discussion and debate were fostered, and unusual responses were explored for insight, connection and scaffolded learning that might be attributed to experience or nascent topics in learning via the template (Figure 1).

The feedback on WK, CSW and SIOD initiatives in block one 2022 covered a range of topics, some of which were discussed in class. Experiential exercises were used to reinforce the initiatives and encourage open and diverse comments using reflection and reflexivity frameworks. External organisations such as the Sustainable Business

Network and the Climate Leaders Coalition were studied, with the aim of exploring a bigger, organisational sustainability picture and absorbing more knowledge of sustainable activities outside of the Auckland campus. These initiatives helped to contextualise the need for education with embedded sustainability.

Information was categorised and explored to assess breadth and depth of response. Different approaches could be trialled afterwards for improvement or to transform sustainability on campus. Collaboration and value-added opportunities were of particular interest; the project-based learning product became a value-added output of the learning and teaching process.

Ethical considerations addressed in application AIC85 included anonymity, with non-identifiable personal information; questions were designed as general and improvement-based, with secure storage. The ethics board that approved the research for publication did not identify any potential physical, power-based or emotional risks for adult participants related to the research method.

WĀNANGA KAIRANGAHAU: FEEDBACK AND EXPLORATION

Wānanga Kairangahau – Student Researcher Workshops (WK) began on campus in March 2021 (Cherrington et al., 2021). When OPAIC student research forums were 're-instigated' in 2021, heads of departments invited top student scholars to participate; nevertheless, student research was rarely published, although a campus journal was being mooted. To address this gap, a few senior researchers handpicked excellent student scholars to trial a process-led series of workshops, aimed at turning assessment research into journal publication. The process was iterated and honed within and between term blocks as calls for papers were released. By the end of 2021, a perfected process was delivered as in-class workshops to elevate assessment research generally and to engage top student researchers to publish in the future.

An alumnus, employed in our student success team, delivered Wānanga Kairangahau – Student Researcher Workshops as four one-hour lunchtime sessions; the principal lecturer with responsibility for sustainability competency leadership for OPAIC was supervising lecturer and naturally encouraged sustainability research. It was evident that a warm rapport was created and a 'safe place' for discussion was a highlight of each session. The sessions helped students to embed sustainability and critical thinking in their research; capability is needed to identify disinformation and fake news sources (Morton, 2022; Pace et al., 2020). The student researcher workshops are used as a way of leveraging our Strategic Objectives for Sustainable Practice, especially SOSP 1: to develop sustainable practitioners; each paper has sustainability embedded in it, evident in assessment research as publishable material.

Insightful comments regarding research and Wānanga Kairangahau noted that the sessions:

- reinforced scaffolded learning, notably building on capability for sustainable practice
- detailed how to improve research generally and how to improve report-writing skills
- accomplished more with assessment research, as research should have clear goals
- focused on applied research, where conclusions should supply answers (if not, why?)
- were logical, with structure and ready-to-use hints, with definitions for the main terms
- considered the readers and their journey by addressing questions they might have.

A summary of suggested improvements to Wānanga Kairangahau workshops is provided in Figure 2, compiled from students who supplied feedback on the sessions. The percentages are based on the number of comments supplied that were grouped into similar topic categories. The workshops prompted the inaugural OPAIC Advanced Wānanga Kairangahau Workshop on 25 May 2022 (Cherrington et al., 2021b). Guest speakers from research and technology backgrounds supported upcoming student co-publication targets, anticipating OPAIC's

hosting of the Smart Aotearoa, Sustainable Development competition event on 30 November 2022, and publication of OPAIC's *Rere Āwhio: The Journal of Applied Research and Practice*, which had a sustainability focus in submissions this year.

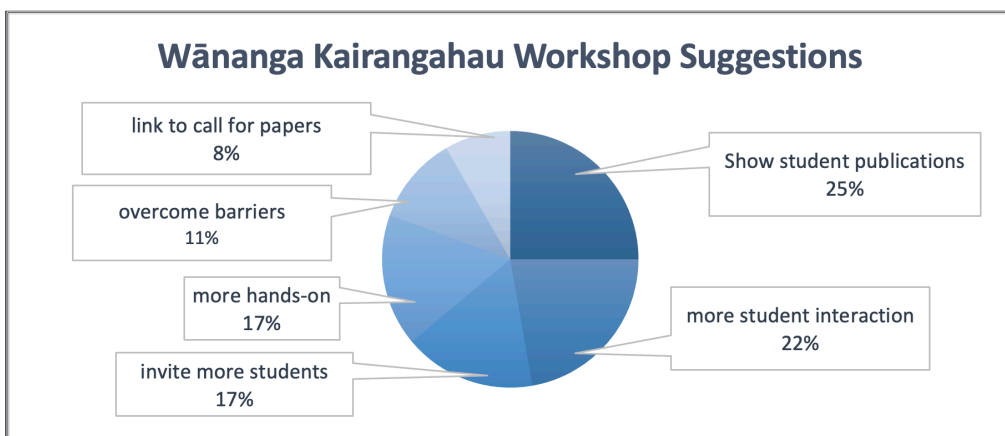


Figure 2. Student suggestions for improving Wānanga Kairangahau Workshops.

The seven campus sustainability initiatives were designed to reinforce each other and leverage capability that was available on campus. Wānanga Kairangahau workshops were not limited to sustainability submissions; rather, sustainability was strongly expressed in our research because of the momentum that the SOSP focus was creating on campus in 2021.

SUSTAINABILITY INITIATIVES: FEEDBACK AND EXPLORATION

Feedback from all three campus sustainability initiatives could be analysed using many valid approaches. This report analyses open-ended responses to campus sustainability initiatives, aligned with the Strategic Objectives for Sustainable Practice and experiential template, and nascent topics (Cherrington, 2020; Zhukov et al., 2022). Insights relate to four questions:

- What are the benefits of creating a culture of sustainability?
- What initiatives should OPAIC undertake to develop sustainable practitioners?
- What are the benefits to OPAIC of membership in the Sustainable Business Network?
- What are the benefits to OPAIC of membership in the Climate Leaders Coalition?

A culture of sustainability was acknowledged by 45 percent of students who supplied feedback on the topic; percentages are based on the number of comments supplied, by simple counts. Note that the groupings are varied and it is fair to say that students are unclear about the phrase “culture of sustainability.” Remarks linked a culture of sustainability to strong environmental benefits (Figure 3), and acknowledged its importance in organisations or career pathways (Cherrington et al., 2021c). This result was significant, as feedback came from an applied management cohort. There was conflict as to whether sustainability might reduce or increase costs (greater context is needed to analyse this feedback in the future). The organisational focus and bicultural connection themes were interesting, given that “partnership for the goals” (United Nations, 2021) was a recurring theme in the papers. These themes likely led to the policy/politics comments.

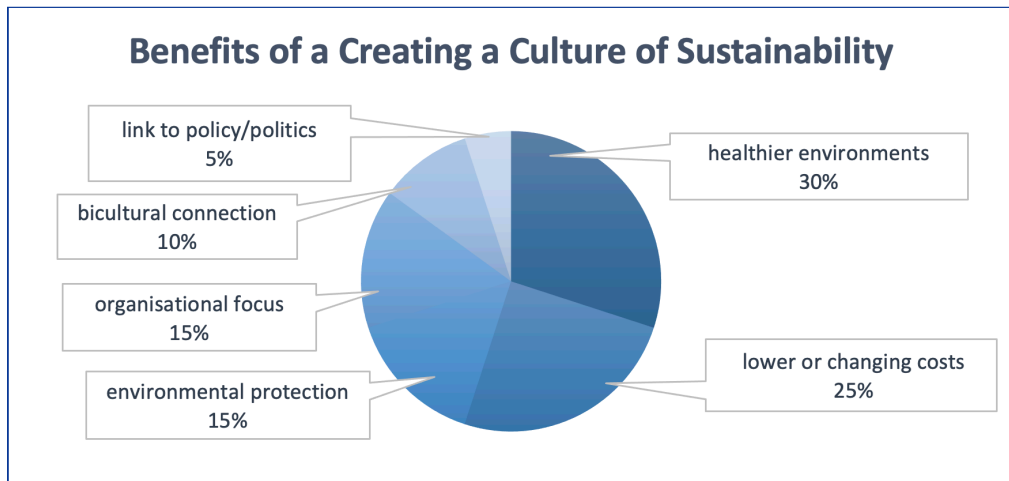


Figure 3. Student perceptions: benefits of creating a culture of sustainability.

Sustainable practitioners could be developed by pursuing OPAIC sustainability initiatives, the students suggested (Figure 4). The link to our strategic objective for sustainable practice was clear; strengthening of sustainability education was indicated in a third of the responses.

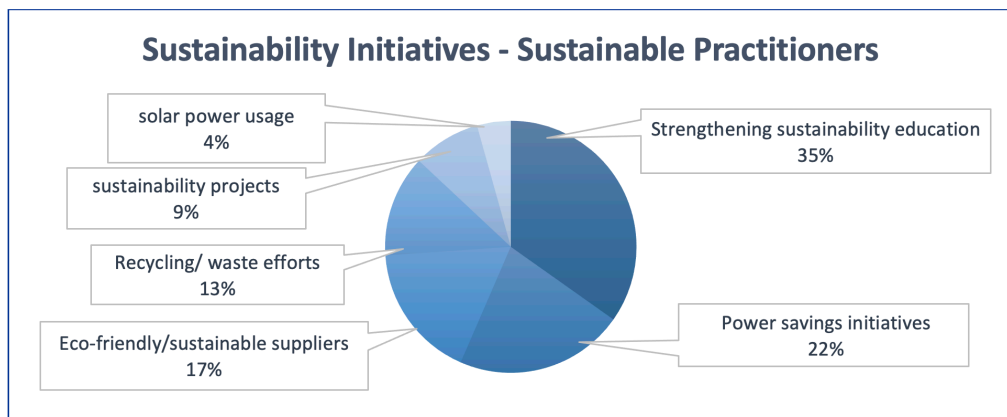


Figure 4. Student suggestions: sustainability initiatives that develop sustainable practitioners.

Tangible initiatives were popular, such as power savings by turning off lights, solar energy usage plus purchasing or supplier choices, which are often given in assessment recommendations. The sustainability initiatives are created and designed to benefit communities.

SUSTAINABILITY NETWORKS: FEEDBACK AND PERCEPTIONS

Students also commented on external networks that were explored via experiential learning sessions. They were referred to repeatedly in feedback comments as various benefits that membership in the networks would present to OPAIC, especially after students watched the IPCC Sixth Assessment Report press conference announcement. Students stated that:

- climate change is not gloom and doom
- the options are clear and the data are clear
- the world has a limited time to move onto the right environmental track
- there is a sense of inertia because policymakers are finally taking note
- implementing sustainability measures can be a game-changer for our environment
- gaps in education are huge in terms of real awareness of the issues
- information and communications can help to turn climate change into climate action.

Sustainable Business Network (SBN) membership is beneficial. Students felt that by joining SBN, OPAIC would align capability and knowledge development in sustainability. OPAIC could lift its reputation with links to business organisations. Students could identify employers with a solid sustainability emphasis (Figure 5) for future job prospects (Oxygen Consulting, 2022).

Participation in Sustainable Business Network events and webinars melds together concepts from the learning and teaching template in an experiential, industry-dynamic way, with pragmatic sustainability challenges that organisations face. SBN provides education and resources for businesses and communities to build sustainable capabilities. For staff keen on updating their knowledge as part of their professional development plans, membership benefits include a reduction in fees and interaction with a plethora of businesses and organisations that readily share their experience and perspectives. Activities are approachable and lead the way, tackling issues relating to Aotearoa New Zealand's climate, waste and environment. Fifty-seven percent of our applied management students were enthusiastic about becoming members of SBN and expected to acquire sustainability knowledge and build sustainability capabilities as a result. A further 29 percent of respondents stated that it would enhance the school's reputation. Another 17 percent connected SBN with business links and the community.

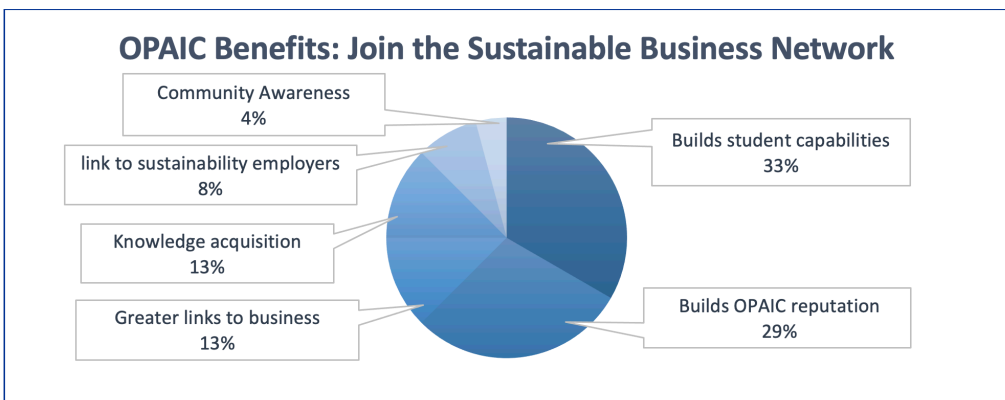


Figure 5. Student-perceived benefits of Sustainable Business Network membership.

Climate Leaders Coalition (CLC) membership benefits were stated by students. Students were likely influenced by the need to reduce emissions meaningfully within organisations to tackle climate change, although the assistance that CLC provided was the leading benefit identified (Figure 6). Definite links to sustainability initiatives on campus were stated (Manate et al., 2021), as well as knowledge about how sustainability is applied in diverse organisations. A greater vision of the benefits could be identified with the focus on partnership, emission reduction and novel methods connected to the circular economy.

Participation in and commitment to the Climate Leaders Coalition tenets are key; member organisations send a public signal that they are dedicated to climate action and are meeting minimum commitments. The CLC is on a mission to reduce emissions. They share information and case studies and lobby for change, government investment and climate action with zero-carbon responsive initiatives.

One hundred percent of the students wanted OPAIC to commit to CLC membership; no one objected to it. Students felt that by joining the coalition, OPAIC would work alongside businesses to achieve zero carbon aims. As with the Sustainable Business Network, there was a stated desire to expand OPAIC's sustainability activities, with interest in Green Office Toitū, events, webinars and presentations (Bredenkamp et al., 2022).

Some students noted that designing out waste supported a circular economy and minimised the use of new resources without wasting resources. As a result, greenhouse gas emissions would reduce significantly, a countermeasure that draws a lot of attention worldwide. Student shared ideas in discussions where ideas were actively exchanged, much as the CLC does.

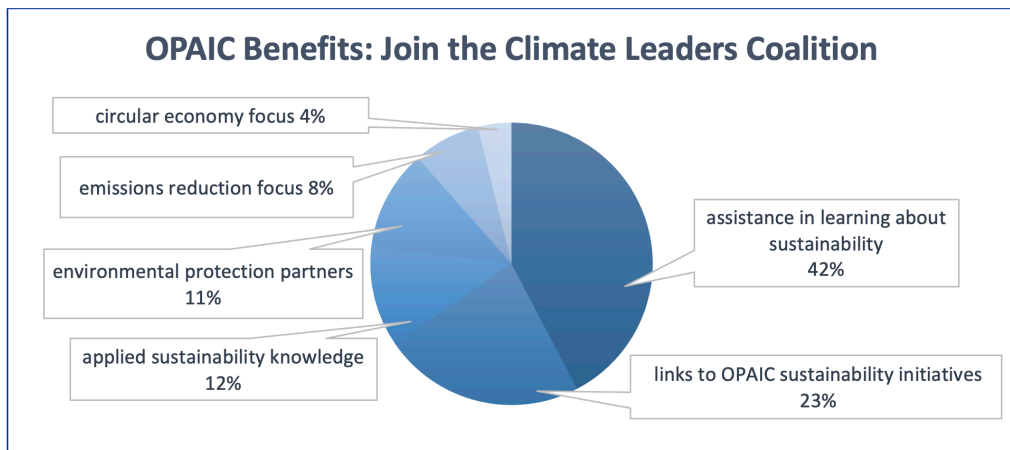


Figure 6. Student-perceived benefits of Climate Leaders Coalition membership.

LEARNING AND TEACHING VIA PROJECT-BASED LEARNING PRODUCTS

The learning and teaching template is designed for collaborative learning; experiential tasks are routinely worked through collectively during “topic of the week,” “mahi tahi” and project-based learning slides. While examining the meaning of the Strategic Objectives for Sustainable Practice (SOSP) in the context of our OPAIC campus, students were asked to use groupwork to create a project-based learning product. This was underpinned by a back-casting session in which students envisioned a future state that could be achieved using step-wise progress.

Students decided that all four SOSPs could be advanced as a linear process, using continual, iterative improvement such as plan-do-check-act (PDCA) (Deming, 2018). In this way, the proprietary product, with all the work that underpinned it, could be given to new cohorts of students at OPAIC to support their development as sustainable practitioners in any field of study. A student-based learning product could be a game-changer (Siren et al., 2022), empowering students to be capable sustainable practitioners, adding value to organisations, businesses and communities.

It was felt that the Strategic Objectives for Sustainable Practice already formed a natural progression, especially because each paper in applied management had sustainability embedded in it or had a sustainability context that could be exploited to build sustainable practitioners within various qualifications. The project-based learning product paraphrased the SOSP as a linear process; it could be augmented or developed contextually within any other paper as an experiential learning and teaching tool (Figure 7), or could be delivered as a student-centred learning and teaching workshop (Ganeshan et al., 2021). Bullet points highlighted first steps in progressing back-casting ideas (Delaney, 2015). Contentiously, the students rephrased the SOSP from their own perspectives and understanding.

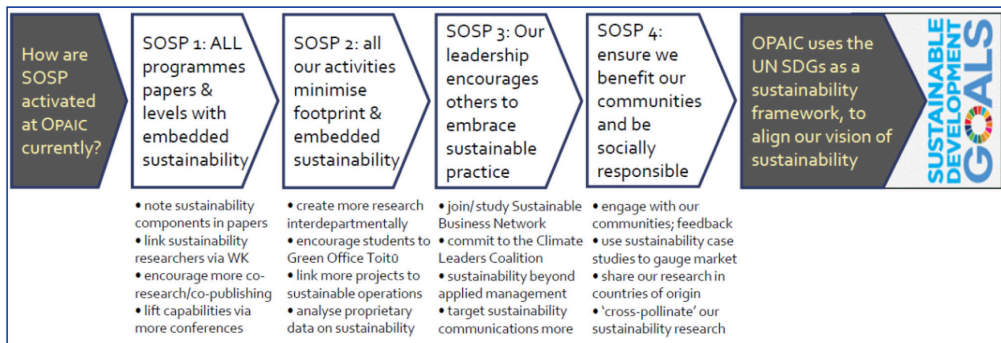


Figure 7. Project-based learning product: SOSP contextualised as a backcasted, bullet-point process.

The project-based learning product encapsulated eight weeks of learning in block one, 2022; it could be activated and progressed by any cohort in the next block. It could be taught via student-centred learning and teaching experiential exercises. Students commented that project-based learning (PBL) created an “optimal learning environment” and “enabled them to deepen their knowledge and understanding” with embedded sustainability. It was felt that PBL utilised student interaction to address multiple needs in a holistic way.

CONCLUSIONS AND FUTURE-BASED RESEARCH

The recontextualising of our Strategic Objectives for Sustainable Practice in 2022 emphasises how critical it is to overcome the climate crisis with climate action based on learning, knowledge sharing and strategies to work sustainably. Learning about sustainable practices through the Sustainable Business Network will improve the capabilities of students, which in turn will enhance the reputation of the OPAIC. Commitment to the Climate Leaders Coalition will require student involvement in measuring, monitoring and mitigating emissions. A greater focus on sustainable operations will be activated in the institution. Being part of these larger networks will attract more students interested in sustainable practices to OPAIC, which will further accelerate sustainable development. Participation in SBN and CLC can also bring marketing advantages to OPAIC, allowing it to use sustainable practices as its selling point.

Sustainable development will soon transform businesses, strengthen the economy and protect our planet. Many more organisations and communities will be involved. It is crucial for OPAIC to showcase all that we do experientially with students via events, webinars and initiatives. Climate action is empowering and vital to overall wellbeing. A greater commitment to sharing our work and communicating our sustainability initiatives and research will ensure that our activities benefit our communities and the world we work and live in. The commitments undertaken by Otago Polytechnic Auckland International Campus can build our reputation for sustainable development and will lead to a positive chain reaction of people becoming even more interested in sustainability and more capable as sustainable practitioners.

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