

Transforming sustainable learning, teaching and research through Living Labs. Context paper for Waipapa Taumata Rau's Sustainability Strategy Development

Purpose: *to describe the concept of "Campus as a Living Lab" and to provide the basis considering whether the University of Auckland should adopt this approach .*

Waipapa Taumata Rau|University of Auckland, as for other Universities, are well placed to apply our skills as educators researchers, critical thinkers and partners of our local and global communities to the complex and interrelated transdisciplinary sustainability challenges we face. An increasingly frequent approach to harnessing the strengths of a University to solving broader problems is by adopting the **"Campus as living lab"** approach. A recent North American study identified 347 US and Canadian institutions adopting, and reporting on, the outcomes of a "campus as living Lab" approach to problem solving and education in Sustainability (Rivera and Savage 2020). ¹

What are Living Labs?

Put simply, living laboratories can be defined as any productive or educational use of the campus landscape.

In general the living lab concept has 3 components²

- 1) Integration of teaching, innovation and research in the real life campus setting
- 2) The inclusion of multiple partners in the process
- 3) An open approach to co-creation

This means that students, academic and professional staff, and external bodies may collaborate on a project dealing with a real sustainability related question

A practitioners guide, Joint published by The green offices of Delft University and Hochschule für Technik Stuttgart ³ identifies that Living Labs are best suited to very complex interdisciplinary problems that require input from a range of expertise and experience. Identifying these problems and their components, assembling, the thinking and resourcing and working through the innovation, successes and failures provides outcomes in research, education, campus operations, the local community and in connections with industry and engagement across and between all of these groups.

Various institutions and academic groupings have crafted their own specific models.

For example

"UBC's Campus as a Living Lab (CLL) initiative responds to such (sustainability) challenges by integrating academic research and teaching with campus planning, infrastructure,

¹ Rivera and Savage . J Environ Stud Sci (2020) 10:334–340 [earch-through-living-labs/](#)

² The University Campus as a Living Lab for Sustainability A Practitioner's Guide and Handbook. 2019 Leendert Verhoef Michael Bossert. Delft University of Technology, Hochschule für Technik Stuttgart ISBN 978-3-940670-68-7

³ The University Campus as a Living Lab for Sustainability A Practitioner's Guide and Handbook. 2019 Leendert Verhoef Michael Bossert. Delft University of Technology, Hochschule für Technik Stuttgart ISBN 978-3-940670-68-7

operations and community development. We are able to use the university campus as a sandbox to explore opportunities and test new ideas in our local context, while learning from both our successes and failures (University of British Columbia)⁴

“..an interdisciplinary collaborative platform that aims to foster innovation and community engagement by addressing sustainability issues in a real life context . In essence the Living lab is about utilizing a universities research and teaching capabilities to address problems within the Universities wider operations, foster increased community engagement and tackle the vitally important sustainability challenges the world is currently facing” (University of St Andrews)⁵

“hands-on learning opportunities for students” that “merge academics and campus facilities management to provide students with real-world skills and, for the institution, a path to meet its sustainability goals” - American Association of Community Colleges (AACC)

“a given place where problem-based teaching, research, and applied work combine to develop actionable solutions that make that place more sustainable” - Portland State University

“The Living Lab for Sustainability (...) brings together students, academics and staff to test new ideas, apply research to practice, and develop new solutions for enhancing sustainability within the University through projects, internships and research. The University serves as a case study or ‘testing ground’ for a research project or dissertation. Access to data, contacts and other information can be provided so that researchers and students are able to conduct studies while achieving tangible impacts and outcomes. The Living Lab also offers paid internships and an award is offered each academic year to develop solutions to issues relating to the University of Cambridge estate”. (University of Cambridge)

Implementing the Living lab concept requires clear leadership, coordination and a commitment to ongoing support.

Opportunities and Benefits of Living Labs for the University of Auckland.

Living laboratories could have many benefits for the University and our students:

- facilitating experiential learning and making curricula relevant (through multidisciplinary and experiential learning) e.g. projects to reduce specific carbon footprint, efficient use of targeted resources,
- enhancing student experience through relevant and impactful courses and potentially improve University completion
- instilling students with relevant skills that have real-world impact
- providing support for operational staff for implementing certain projects
- fostering internal partnerships and connections within the University
- enabling businesses to test products and technologies while building enduring partnerships with UoA
- helping governments and NGOs achieve larger sustainability goals while building partnerships with universities

⁴ <https://sustain.ubc.ca/campus-living-laboratory>

⁵ chrome-

extension://efaidnbmnnnibpcjpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.kent.ac.uk%2Festates%2Ffiles%2Fsustainability%2FESD%2FPublications%2FSt%2520Andrews_living-lab-report.pdf&clen=5856130&chunk=true

- potential for comparative assessment of progress by utilizing the STARS framework⁶.

(some examples of such projects are appended below)

Living labs provide opportunity for real world learning . By working on practical projects and in authentic situations students can acquire an opportunity to apply their knowledge and gain job-market relevant skills. Academics have an opportunity to acquire data for their own applied research and engage with students to enhance their modules. Living Labs can offer campus operations managers an opportunity to maximise the value of estates, as well as to experiment directly on campus to address pressing issues or real problems. Businesses, especially SMEs, can find a novel way to engage with universities at low cost and to address immediate and local needs to advance otherwise costly innovation projects.

As a result the University will have a platform to integrate our communities and achieve our multi-faceted missions: enhancing the student experience and graduate capability , promoting relevant and impactful research and attracting resources to enhance our reputation, services and contribution.

Examples of projects at comparable Universities:

University of Tasmania: *Sustainability Integration Program for Students (SIPS)* . Place-based education programme focused on-campus operational priorities, involving all campuses, and incorporating curricular, extracurricular and research projects. (<https://www.utas.edu.au/infrastructure-services-development/sustainability/SIPS>)

London School of Economics and Political Science: *Plastic Free LSE*

- Campaign responding to rise in global awareness about plastic pollution, including LSE students and staff. Engaged with more than 750 students and staff who jointly delivered 25 Green Impact projects reducing single-use plastics.
- Encouraged student-led mini research projects and behaviour change campaigns funded by LSE's Sustainability Projects Fund, a fund created through an internal tax on bottled water sales. Projects included Free the Fish (reducing plastic flushed down toilets) a collaboration with a Marine Society studying plastic waste in oceans and funding for LSE Catering to subsidise the sale of reusable cups.

https://www.sustainabilityexchange.ac.uk/green_gown_awards_2020_london_school_of_economist

Nottingham Trent University: *Crowd research for a more sustainable campus.* A technique for coordinating a large group of people in research, applied in this case to increasing awareness of campus recycling. Crowds conduct a complete cycle of research

⁶ In North America public sharing of Sustainability progress data is done through the Association for the Advancement of Sustainability in Higher Education(AASHE)'s Sustainability Tracking, Assessment, and Rating System (STARS) tool. This tool includes measures of Living lab engagement and performance . *Association for the Advancement of Sustainability in Higher Education(AASHE) (2017b) STARS® technical manual version 2.1.*<https://www.aashe.org/wp-content/uploads/2017/07/STARS-2.1-Technical-Manual-Administrative-Update-Three.pdf>.



in a single-day to propose solutions, pooling collective efforts and research findings. Technique can be used for many sustainability topics.

<https://www.ntu.ac.uk/about-us/news/news-articles/2019/11/NTU-students-tackle-barriers-to-recycling-through-crowd-research>

University of Melbourne: *Fair Food Challenge*. Student-run initiative to transform campus food environment to more healthy, fair, sustainable. Projects such as community kitchens, serving ware reuse service, portable bike kitchen, community lunches, food waste workshops, free fruit boxes in library. Team conducts research, facilitates community feedback and empowers students to participate in university decision-making.

<https://students.unimelb.edu.au/student-precinct/project-updates/launch-of-two-new-activations>

University of Otago: *He Kāika Toitu, he Kāika ora: The Sustainability Neighbourhood*. UniFlats and Sustainability Office collaboration – Three flats (20 beds) became a Living Lab, with residents supported to live sustainably while contributing to research and student projects to inform the wider community and landlords.

<https://www.otago.ac.nz/uniflats/flats/sustainability-neighbourhood/>

Queen's University Belfast: *Nurture and Grow: Connecting people through nature* (GGA winner large institution 2020, SE). Staff, students and residents from the local community joined forces to enhance the range of habitats within Queen's community, ensuring South Belfast is providing a home for wildlife and enabling the local community to pull together and take action for climate change. Designed, planned and created a range of biodiversity schemes resulting in a network of biodiversity hotspots and carbon sinks in the local community. NGO involvement and connections to city and regional environmental strategies and campaigns.

<https://www.qub.ac.uk/directorates/EstatesDirectorate/Services/SustainabilityatQueens/Biodiversity/>