Living Labs: teaching resources

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Introduction to Living Labs at Liverpool

A Living Lab at Liverpool means harnessing the talents of our students and researchers to address social responsibility and sustainability challenges within our infrastructure, operations, and behaviours.

The Living Labs programme supports the commitments outlined in the University's Sustainability Strategy and Liverpool 2031, to reimagine a research-connected curriculum that addresses real-world challenges, and to embed sustainability across teaching and the wider student experience. The University has the target of net-zero emissions, as well as a 50% reduction of waste sent for incineration by 2025. Living Labs bring together research, teaching, and operations to find creative ways to meet these targets while also tackling wider sustainability challenges.

Living lab project examples

The UoL Circular Economy Project exemplifies the University of Liverpool as a living lab, where students apply engineering and design expertise to real-world sustainability challenges. A team of 14 mechanical engineering and four industrial design students, supported by faculty

and industry partners like Plastic Tactics, is pioneering a circular economy on campus by transforming single-use plastic bottles into valuable resources.

Through reverse engineering and upcycling, the team designs and builds specialised machinery to convert plastic waste into recycled materials for 3D printing and manufacturing. This hands-on initiative allows students to test and refine sustainable production models while exploring innovative solutions.

Beyond technical skills, the project fosters interdisciplinary collaboration, problem-solving, and entrepreneurship, equipping students for future careers in sustainability-driven industries. By engaging with real waste streams and assessing commercial feasibility, the team turns academic research into practical impact.

This initiative demonstrates how the University operates as a living lab, an interactive space where students bridge theory and practice to develop scalable solutions for global environmental challenges, reinforcing eco-responsibility while enhancing their employability and innovation skills.

Go to the main Living Labs at Liverpool webpages, managed by the Sustainability Team, for detailed information about how the university supports our Living Lab programme including information on past projects, current projects and how to propose a new project.

Example learning outcomes for Living Lab projects

Enabling students to engage with real-world sustainability problems provides an opportunity to develop their sustainability competencies – particularly their critical thinking, systems thinking, collaboration, and integrated problem-solving competencies:

Learn more about Education for Sustainable Development (ESD) will provide detailed information about the eight sustainability competencies.

Example learning outcomes aligned with competencies for sustainability - learning outcomes that you adapt to your subject discipline to support living lab projects.

Considerations when embedding Living Lab projects into your teaching

- **Module fit**: identify where in the course structure the Living Lab project fits best e.g. as a capstone project, a semester-long assignment, or a practical lab component. Existing assessed student individual or research projects can be adapted to support Living Lab projects.

- **Algin with sustainability competencies**: ensure that you design and assess any Living Lab project to identify how the project will develop and enhance any of the eight competencies for sustainability.
- **Skill development**: emphasise to students the benefits of Living Lab projects that can include transferable employability skills for example, project management, stakeholder communication, data analysis, and ethical reasoning.
- **Scaffolded learning**: break the project into phases (e.g., problem identification, research, intervention design, implementation, reflection) to support progressive learning. You may also want to consider where in your programme students will be best placed to engage with these types of projects i.e. have they been able to progressively develop appropriate skills and competencies earlier in the programme.
- **Co-creation with students**: involve students in the design and implementation of Living Lab projects where possible to foster ownership and enhance employability skills. Develop projects that are sensitive to diverse student backgrounds and perspectives on sustainability.
- **Interdisciplinary opportunities**: promote cross-faculty collaboration where possible to enrich learning and reflect the multifaceted nature of sustainability challenges.
- **Authentic assessment design**: develop project assessments that reflect real-world outputs e.g. sustainability impact reports, project proposals, or stakeholder presentations. Use reflective journals and portfolio assessments to support students to internalise and connect their learning to personal and professional goals.
- **Blended delivery**: use digital platforms (e.g., VLEs, Miro, Padlet) where appropriate for collaboration and documentation, in additional to utilising physical campus spaces for experimentation enhancing student professional collaborative skills and digital competencies.

Read about the UoL Circular Economy Project.

Other past lab projects are available on the Living labs project website.

Project support

The University made a commitment to using Living Labs to drive forward it's sustainability ambitions in 2021, in the first iteration of the Climate Plan. Since then, the University signed the Joint Declaration for a Living Lab Approach to Carbon Neutrality (sponsored by Professor Tariq Ali), alongside Hong Kong University for Science and Technology. As such, the Sustainability Team are spearheading the Living Lab programme with the key role of supporting academic staff in developing projects that align with sustainability's strategic priorities.

The Sustainability team do this by:

- Providing information and data for staff and students to use in teaching and research
- Guiding staff on the development of projects that fulfil the needs and requirements of the University's Sustainability Strategy
- Ensuring projects feed into monitoring and reporting of institutional sustainability KPIs
- Evaluate the Living Lab programme annually

The Sustainability Team, and University as a whole, act as 'clients' for the Living Lab projects, determining the required outputs, to ensure a successful and impactful project.

The Centre for Innovation in Education can offer support for living labs projects to ensure they align with Curriculum 2027 objectives and help identify how specific projects can support the development of student sustainability competencies.

Support available for living lab projects is summarised in this support responsibility matrix.

Additional resources

System thinking teaching resources

Interdisciplinary learning for ESD teaching resources

Problem-centered learning for ESD teaching resources

ESD toolkit

Further support

Contact the Sustainability Team sustainability@liverpool.ac.uk
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