Fostering sustainability in lab education – a webinar recap

** Extras are shared on p. 5 and further.*

On Tuesday, January 13th 2026, Present-day Practicals hosted its fourth webinar:

🌼 **Fostering sustainability in lab education** 🌼

The webinar explored how teaching labs can transition from being resource-heavy environments to hubs of sustainable scientific practice. The webinar speakers were **Marit de Kort** (UMC Utrecht, The Netherlands) and **Dr Gina Washbourn & Dr Cate Cropper** (University of Liverpool, UK).

Topic of this webinar

The central question addressed was: **How can we teach students to handle chemicals with care while simultaneously teaching them to care for the planet?** The speakers discussed how sustainability can be integrated as a core part of scientific learning, rather than an afterthought, without compromising its educational value.

The webinar focused on three main pillars:

1. **Planetary health:** Understanding the inextricable link between human health and the health of our planet.
2. **Sustainability in practice:** Identifying the major environmental impacts of laboratory work (energy, waste, and chemical use).
3. **Educational integration:** How to empower the next generation of life sciences professionals to adopt a "Green Science" mindset.

Sustainability challenges in the lab

The presenters highlighted the staggering environmental footprint of traditional labs:

- **Plastic waste:** Labs are responsible for a significant portion of global plastic waste.
- **Energy consumption:** A single Ultra-Low Temperature (ULT) freezer can consume as much energy as an average US household.
- **Chemical impact:** The "bench to drain" lifecycle often overlooks the long-term ecological consequences of chemical disposal.

Practical solutions and case studies

The speakers shared concrete examples and tools to help educators "green" their labs.

Dr Gina Washbourn and Dr Cate Cropper shared their journey of implementing sustainability through a series of focused projects. Project details are in the slide deck.

Established sustainable practices

- **Waterless condensers**: Replacing traditional water-cooled condensers with air-cooled alternatives to drastically reduce water consumption.
- **Lab armour beads**: Substituting water baths with thermal beads to save energy, reduce water use, and minimize contamination risks.
- **Solvent recycling**: Implementing systems to recover and reuse solvents, reducing both chemical waste and procurement costs.

Current & ongoing initiatives:

- **Plastic Circularity:** Exploring ways to close the loop on laboratory plastics, moving beyond simple disposal to true recycling or reuse within the university ecosystem.
- **Living Labs:** Utilizing the campus and its laboratories as active testing grounds where students and staff co-create sustainability solutions.
- **Embedding Sustainability in Assessment:** Shifting from "optional" green tips to making sustainable practices a formal part of student learning objectives and marking rubrics.

Marit de Kort introduced tools from the UMC Utrecht **Planetary Health Integration Team**, emphasizing that the healthcare sector itself has a large carbon footprint. By integrating "Green Science" into the curriculum, we can prepare students to lead more sustainable medical and research practices.

Tool links

Guidelines socially responsible research

E-modules Just and Sustainable Laboratory Research (EU) and Just and Sustainable Research Practices (both are available for free on the E-learning platform of the Kenniscentrum Global Health, and require an account - the UMC Utrecht is working on a way to share these resources across educational organisations, but this is not yet possible)

Interaction with the international audience

The diverse audience, representing 19 countries, engaged in a vibrant exchange via the **Padlet platform** and the chat. This interactive part also allowed participants to share "Golden Tips" and community resources.

Community efforts & shared networks: Sustainability was highlighted as a **team effort**, and the audience shared communities not originally listed on the SELS website:

- **SOS GreenImpact:** Kimberly Crevits shared how their lab participates in an "ecoteam" competition/collaboration using the SOS toolkit. SOS GreenImpact Toolkit
- **Green Labs BE:** Wouter De Broeck announced a satellite event for the "Green Science Festival" (May 28th) across Flemish universities, potentially kicking off a Belgian Green Labs network.

Golden Tips from the Audience:

- **Sustainability champions:** Designate a "LEAF champion" in research groups (from PhDs to postdocs).
- **Smart recycling:** Label pipette tip boxes to track chemical usage for reuse or donate cleaned tips to foundations (e.g., training guide dogs).
- **Efficiency:** Monitor high-energy equipment like freeze dryers that often run 24/7.

Engaging students: Participants emphasized including sustainability in **lab introductions** and making it a formal part of **assessments** to foster a genuine culture of accountability.

Key take-home messages

The webinar concluded with actionable advice for educators looking to make an impact:

- **Lead by example:** Students learn sustainability best when they see it practiced in the lab environment every day.
- **Integrate, don't add:** Sustainability should be a thread woven through the existing scientific curriculum, not a separate, optional module.
- **Use available tools:** Don't reinvent the wheel—utilize existing frameworks like LEAF (Laboratory Efficiency Assessment Framework) or Green Lab checklists.

- **Impact on students**: fostering sustainability has a profound impact on students' professional identity.

Wrap-up – enroll for the next webinars and/or a LabBuddy session!

The webinar concluded with a **wrap-up by the organizers** and an invite to enroll for upcoming webinars in the Present-day Practicals series and a special LabBuddy session.

- Artificial intelligence in lab education — Thu 29/01/26
- The student research hub network for interdisciplinary challenge-based education — Tue 17/02/26
- LabBuddy* session: Enhancing lab education — Thu 19/03/26

Register here for the Present-day Practicals series => Webinar series 25/26 and/or

Sign up for our special LabBuddy* session => Enhancing lab education with LabBuddy

See you soon!

On behalf of the organizers

** LabBuddy provides an e-learning solution to support students in preparing before the start of the practical work, while working in the lab or field, and to guide them during the processing of their results after the practical work. Visit our website for more information, https://www.labbuddy.net/.*

Extra - Resources and further reading

The presenters recommended the following platforms and documents to help transition towards more sustainable laboratory education and research:

- **SELs Network (Sustainable European Laboratories):** sels-network.org

This network unites European "green lab" initiatives to share knowledge and promote sustainable research standards. It is a great starting point for finding a community of like-minded professionals across the continent.

- **KCGH (Knowledge Centre for Global Health):** www.kcgh.nl

A Dutch hub focused on global health and planetary health. Visitors can find educational materials and insights on how environmental disruptions impact human health, helping to ground lab sustainability in a broader global context.

- **Socially Responsible Research & Education Guideline:** Guidelines socially responsible research

This specific guideline (available via KCGH) provides practical advice for students and researchers on how to conduct science with social and ecological responsibility. It is essential reading for those wanting to align their research ethics with planetary health.

- **LEAF (Laboratory Efficiency Assessment Framework):** UCL LEAF

Developed by UCL, this is a globally recognized accreditation tool. It provides a structured framework (Bronze, Silver, Gold) for labs to reduce their carbon footprint, waste, and costs while improving research quality.

- **CondenSyn Sustainability Report:** Asynt Evaluation - University of Liverpool

A detailed case study from the University of Liverpool demonstrating the massive water savings achieved by switching to waterless condensers. This report provides the evidence-based data needed to justify equipment changes in your own institution.

- **University of Liverpool Living Labs:** Sustainability Topics: Living Labs

This site showcases how the university uses its own campus as a "living lab," where students tackle real-world sustainability challenges as part of their assessment. It offers inspiration for educators looking to make coursework more impactful and authentic.

Extra – answers to questions from the chat

Q- Do you also collect polypropylene tubes and micropipette tips, etc., for recycling?

A - Often not for recycling, but where they have not been heavily contaminated, we will rewash and reuse. This depends on the purpose of the equipment being used e.g. using it for contaminant sensitive analytical equipment, reuse isn't always possible. There can be challenges around recycling and contamination depending on lab settings and location.

Q- do you have recycling options for borosilicate glass?

A - This is a real challenge! Mostly because a lot of our glassware is considered "contaminated". We are fortunate to have a glassblower on site so for some damaged glassware, we are able to repair.

Some questions to the presenters and the audience (so we don't have to reinvent the wheel). Don't want to dilute the education angle of the presentation, but am wondering about your experiences (as there are now 50+ climate-conscience people in chat now):

Q - cleaning: now, we rinse the sharpie markings from glassware using rinsing with a solvent using a wash bottle. That takes multiple mL per beaker. That seems wasteful. Do you have any alternatives on how to do it?

A - We remove marker pen with a scouring pad now instead of solvent. Works well.

Q - consumables: plastic consumables like plastic pipettes/tubes/filters are very common in our labs. They offer convenience and low time investment. Anybody got concrete experience of replacing consumables?

A - Sometimes, rather than replacing these items, because they are one convenient and two often safer than glass alternatives (especially when we are doing outreach with younger students), we aim to reuse instead. Often where possible we will have a sink full of water and detergent ready to go during the session so things can be dumped in there straight away for a clean. Filters we often reuse for outreach when we are doing the same practical (removing TiO2) and it works very well with multiple reuses. I think unless students are aiming to collect analytical data and need hyper-pure samples, reusing is fine.

Q - How is glove recycling going?

A - Slow to get off the ground - collect and recycle is only possible > 5000 gloves. You need to be able to store this amount. Cate will share the details on the deal made with the glove company. You do need to make sure that the students know where to put the used gloves. Avantor is offering a glove recycling program.

The other challenge is to check what gloves have been contaminated with and whether the company will recycle them, or may need a separate avenue for recycling, especially when dealing with multiple labs. They may not be as keen on taking gloves used in synthetic labs due to the levels of contamination.

Q - Do you stimulate not using gloves?

A - There have been endless discussions - Cate now introduced a new glove policy that everyone agreed on. We'll ask Cate to share this policy in the recap.

Q - How do you restrict students to keep their heating to 10% of the boiling point of the solvent when using Asynt air condensers? as we know they are not the most patient.

A - Sometimes this can be difficult! Students can be impatient. We generally find even with low boiling solvents if you use the correct size waterless condenser, you don't get too much solvent loss. So there is a little bit a flex.

The other bit is training. We include information in the lab manual which explicitly states this and discuss this during introductory training sessions and explain what a reflux actually is.

Q - At what level are the e-modules targeted (1st year, 3rd year BSc / MSc?)

A – They're quite low-level (easy to get in to!), I think it depends most on the content of the course and the lab sustainability one makes sense only when students have a grasp on what working in a laboratory space looks like; which for more theoretical programmes may be later years than for more practical programmes. They're also designed to be modular, so you can choose parts from them which apply to your specific course.