# Teaching Sustainability in AEC Education Through Study Abroad and Experiential Learning


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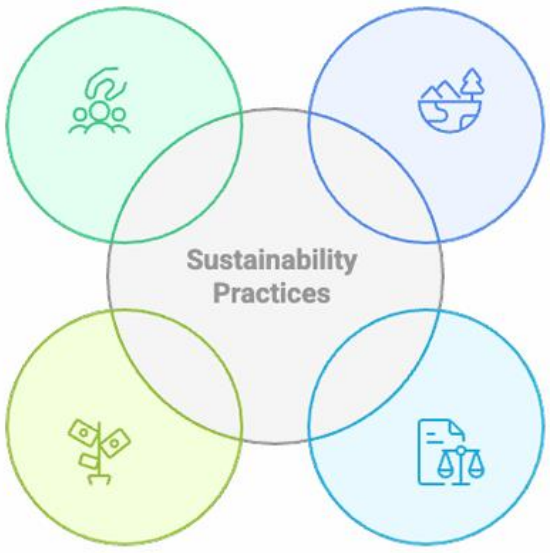
*Auburn University, McWhorter School of Building Science*



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iBEE
Innovation in Built Environment Education

International Council for Research and Innovation in Building and Construction

# Workshop learning outcomes

*By the end of the session, participants should be able to…*

1. **Identify essential sustainability competencies for AEC students.**
2. **Generate learner-centred approaches and exchange teaching ideas with peers.**
3. **Evaluate experiential and global learning strategies that enhance sustainability education.**
4. **Create practical, actionable ideas for curriculum innovation and implementation.**

# Today’s learning journey

*Four activities we move from why → how → evidence → design.*

## 01. Why

Why sustainability matters in the built environment, key topics AEC students should learn, and the role of higher education in preparing future professionals.

## 02. Reflect

Reflect on effective ways to teach sustainability; exchange ideas with peers.

## 03. Experience

Study abroad case: how experiential and global learning can deepen understanding.

## 04. Co-design

Build a simple, practical framework for integrating sustainability into AEC courses.

**Goal: leave with one actionable curriculum idea you can adapt.**

# 1. Why sustainability matters in AEC

*Sustainability is not an elective concern; it shapes decisions across the building life cycle.*

## Life-cycle decisions

Site, design, materials, construction, operation, renovation and deconstruction all influence environmental performance.

## Construction management

On-site processes translate sustainable intent into procurement, waste, IAQ, pollution prevention and installation practices.

## Professional practice

AEC graduates encounter energy, water, waste, materials, carbon and resilience decisions.

## Education challenge

Students need more than terminology: they need opportunities to see, compare, apply and reflect on sustainability in context.




**Prompt** **What should every AEC graduate be able to understand or do about sustainability?**

# 2. What should AEC students learn?

### Carbon & energy

Operational and embodied carbon; energy efficiency

### Materials & circularity

Selection, reuse, waste reduction, life-cycle thinking

### Water & site

Water stewardship, site impacts, biodiversity

### Health & resilience

Indoor environmental quality, safety, adaptation

### Delivery & management

Procurement, planning, implementation, performance

### Systems thinking

Trade-offs across environmental, social and economic outcomes

**PAIR SHARE: Choose one competency that you would prioritise for your students. Why?**

# From teaching content to designing learning

*The central question shifts from "What do I cover?" to "What will students do with what they learn?"*




**Encounter**

A real problem, place, project or decision

**Investigate**

Observe, question, compare and gather evidence

**Make meaning**

Connect experience to concepts and prior knowledge

**Apply**

Use learning to propose, evaluate or decide

**Reflect**

Articulate what changed and why it matters

# Activity 1: Individual reflection

5 MINUTES

## Choose one sustainability concept or practice that AEC students should master.

**A**

What should students KNOW?

**B**

What should students DO?

**C**

What experience would make it REAL?

**D**

How would students SHOW learning?

# 3. Why study abroad can be high-impact

*Study abroad combines place, practice, comparison and reflection.*



**Authentic context**
Students encounter sustainability as a lived system, not only a definition.

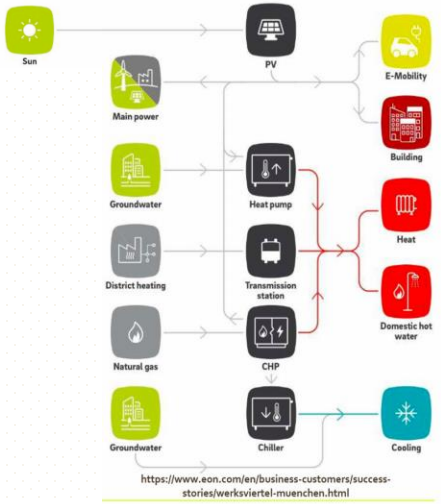
**Comparative perspective**
Different cities and projects make assumptions visible and invite comparison.

**Professional exposure**
Site visits connect students with practitioners, technologies and delivery realities.

**Structured reflection**
Prompts and assignments convert experience into articulated learning.

# Case lens: What students can notice abroad

*A field experience becomes educational when observation is guided by questions.*






**BUILDINGS: East Munchen; Green roof in Berlin**



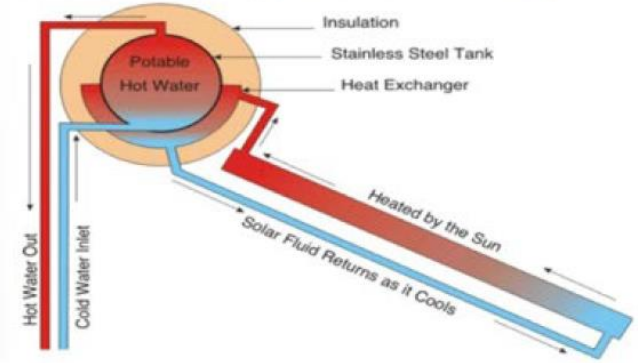
**PROJECTS: 3D printed bridge in Eindhoven**

**What is different? Why? What trade-offs are visible? What could transfer to another context?**

# Case lens: Student Work

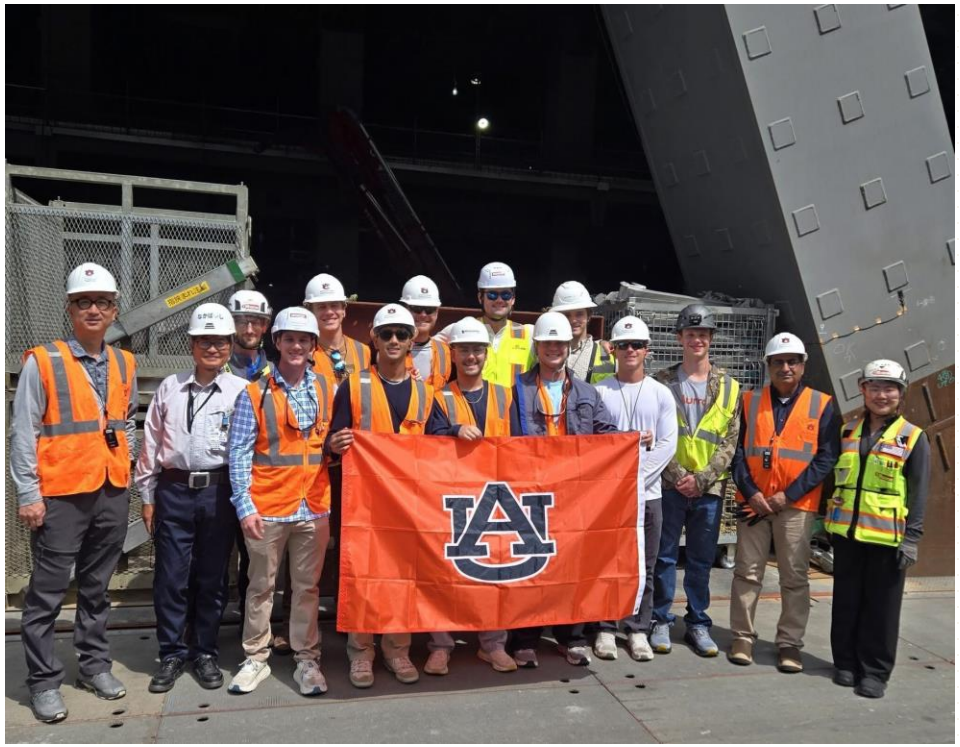
## Santorini Greece Sustainable Assessment

- Nuevo Sol is a solar heater for on demand hot water and for low consumption rates like the villas and offices.
- These passive hot water systems are less complex and ready to install with very low maintenance and longer life.
- The system can hold up to 300 liters capacity.






# Case lens cont….

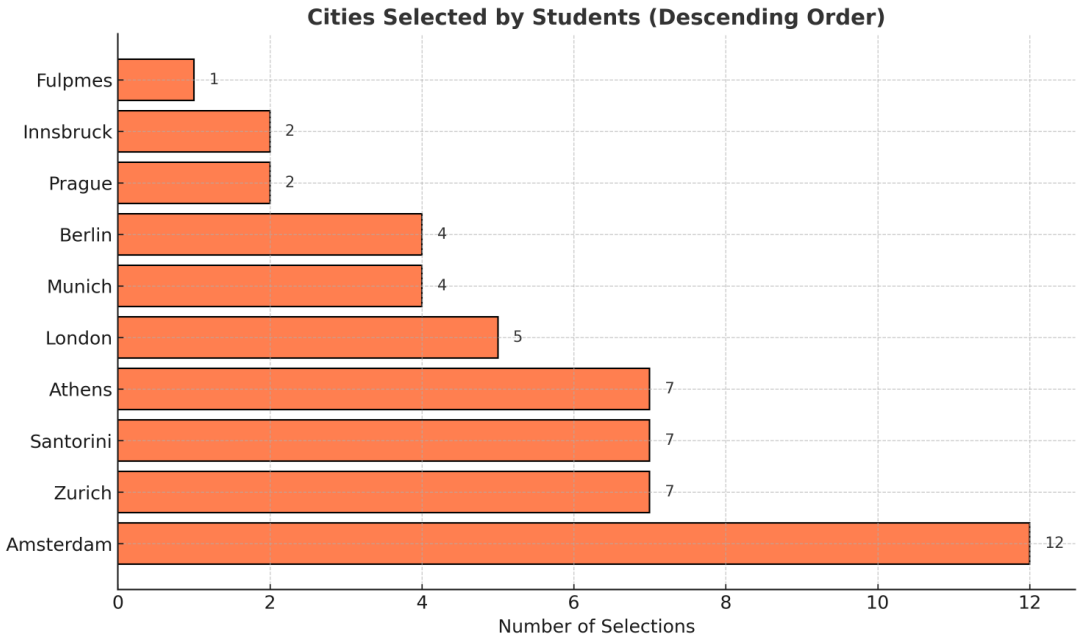




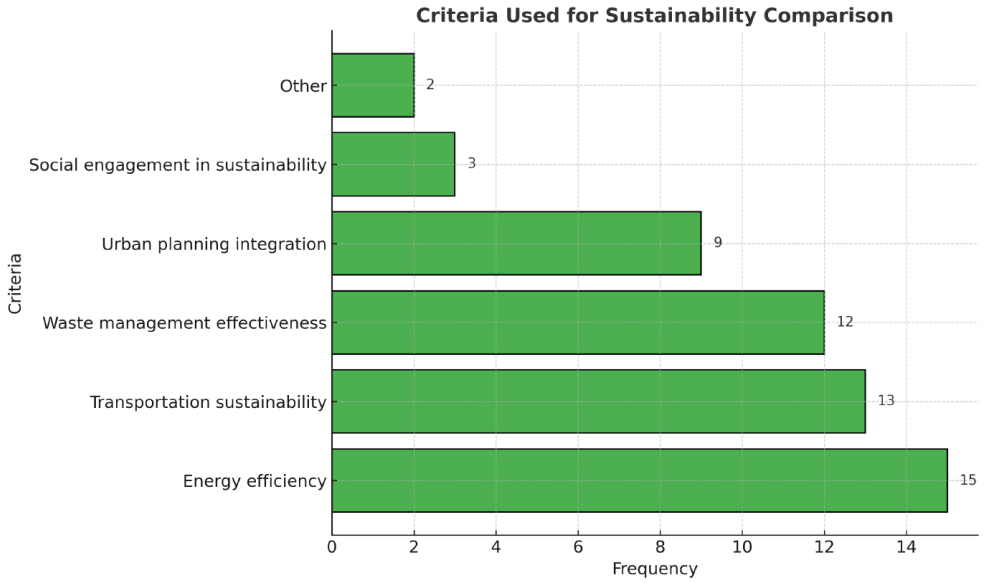

**PROJECTS: Construction methods; Delivery; Professional practice**

**What is different? Why? What trade-offs are visible? What could transfer to another context?**

# Case lens: Student Feedback

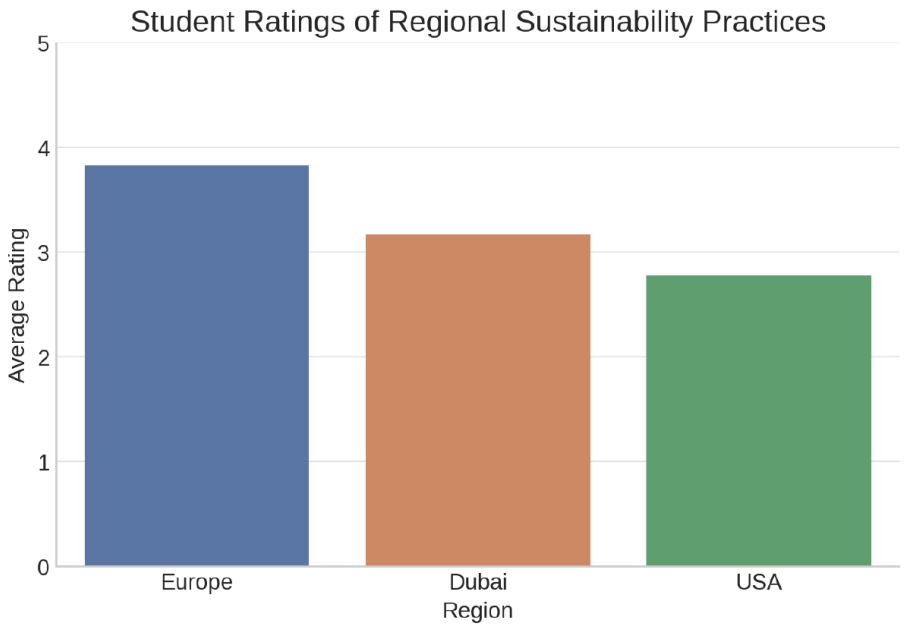


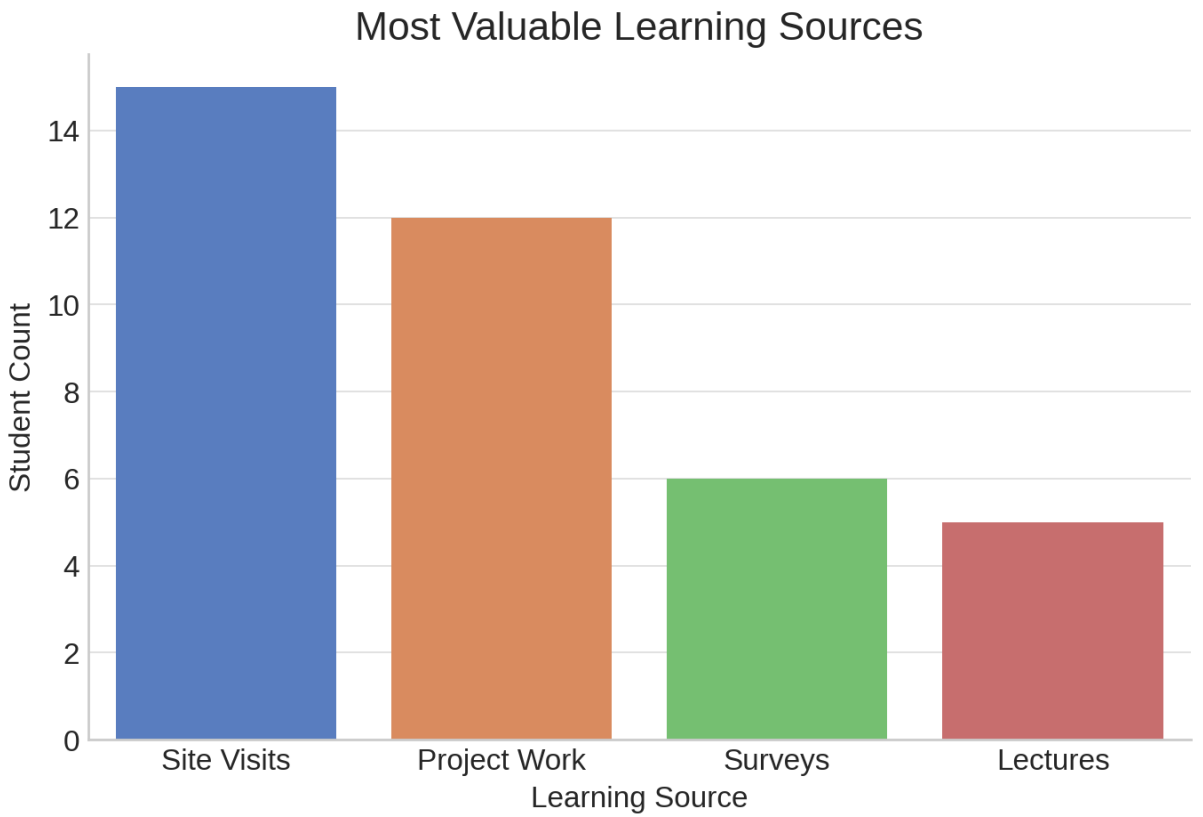

Selected European Cities for Comparison with Dubai




Criteria Employed by Students to Compare Sustainability Practices in Different Cities

# Case lens: Student Feedback



## Experience alone is not the pedagogy

*The learning architecture around the experience matters.*

**BEFORE**

**Prepare**

- ➢ Concept primer
- ➢ Learning questions
- ➢ Baseline reflection

**DURING**

**Engage**

- ❑ Site observation
- ❑ Practitioner dialogue
- ❑ Evidence capture

**AFTER**

**Integrate**

- ✓ Comparative analysis
- ✓ Structured reflection
- ✓ Application task

**Design question: Which of these elements could you reproduce locally, virtually, or through industry partnerships?**

# 4. Activity 3 : Build a simple sustainability learning framework

*Turn the group's best ideas into something usable.*

**1. Competency**

What should students understand or be able to do?

**2. Learning experience**

What authentic task, place, project or problem will they engage with?

**3. Reflection**

How will they make meaning from the experience?

**4. Evidence of learning**

How will they demonstrate learning or transfer it to practice?

**Constraint check: Is it inclusive? feasible? assessable? connected to real AEC practice?**

# Share, critique, refine

*Use peer feedback to strengthen the framework.*

**ENGAGEMENT**

Will students actively investigate or make decisions?

**AUTHENTICITY**

Is the learning connected to real AEC contexts?

**REFLECTION**

Is there a deliberate step for making meaning?

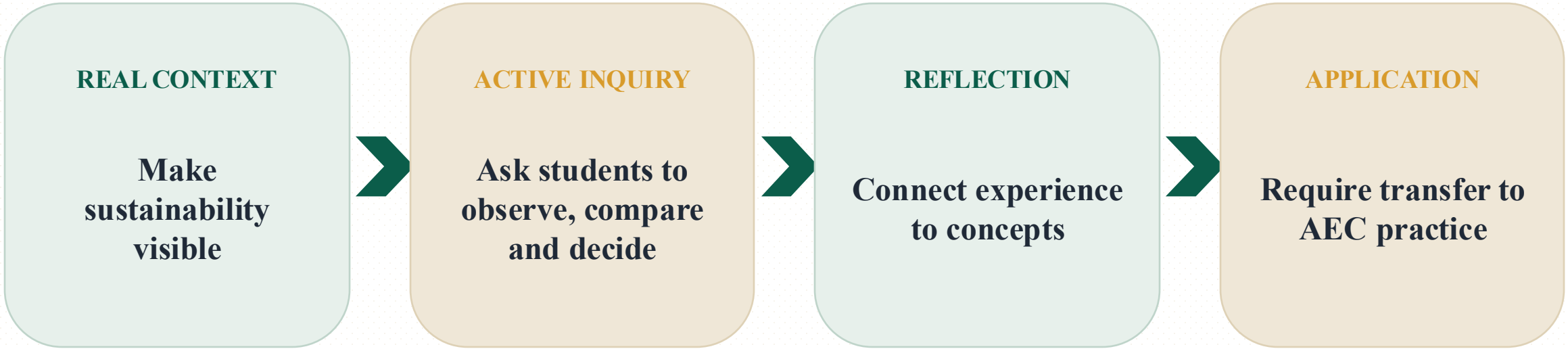
**TRANSFER**

Can students apply learning in a new project or context?

**Feedback protocol** **“One strength…” , “One question…” , “One change that could increase learning impact…”**

# Takeaway: A portable design pattern

*Study abroad is one route; the design principles can travel anywhere.*




**Closing reflection**

**What is one learner-centred sustainability teaching strategy you will implement or explore in the next academic year?**

# Thank You for Your Valuable Time

# Questions? / Discussion

# Activity 2: Compare and exchange

*Small groups: surface patterns, differences and high-impact ideas.*

1. **Which sustainability concepts appeared most often?**
2. **Which teaching approaches seem most likely to engage students?**
3. **Where does real-world context enter the learning?**
4. **What makes an approach feasible in your programme?**

**GROUP OUTPUT: one teaching practice you would recommend to another educator**