Department of Geography
and Development Studies

University of Chester

Students as energy consultants: problem based learning activities in a final year Geography module.

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Wednesday 13th March

Towards Innovative Energy, Environment and Geography Teaching Workshop

Sustainable Futures

- Optional final year module in the Geography department

- Module has 4 blocks
  1. Theory and Concepts
  2. Applications and case studies
  3. **Projects (runs from January – April)**
  4. Presentations and Reports

Projects

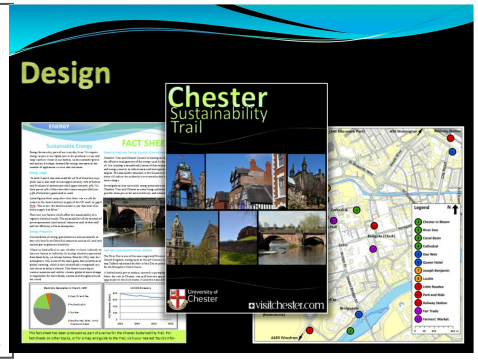
- Projects are established with external (to the University) and internal clients
- Students attend initial project briefings with clients
- Brainstorm plans and carry out project work
- Student groups attend support clinics with tutors every 2-3 weeks
- Present results and recommendations to clients at a mini-conference
- Student project reports sent to clients following assessment

Example Projects

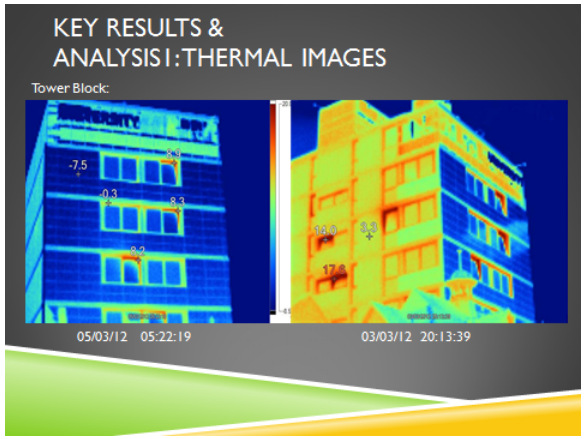
50% of projects are energy related

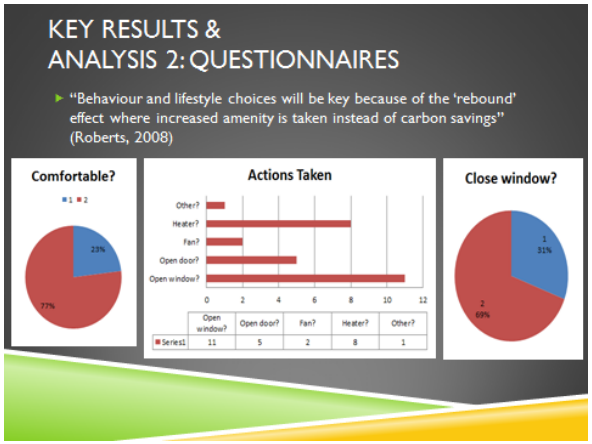
- Thermal imaging
- Behaviour change
- Heating Patterns in Student Accommodation
- Awareness raising – energy efficiency, insulation measures

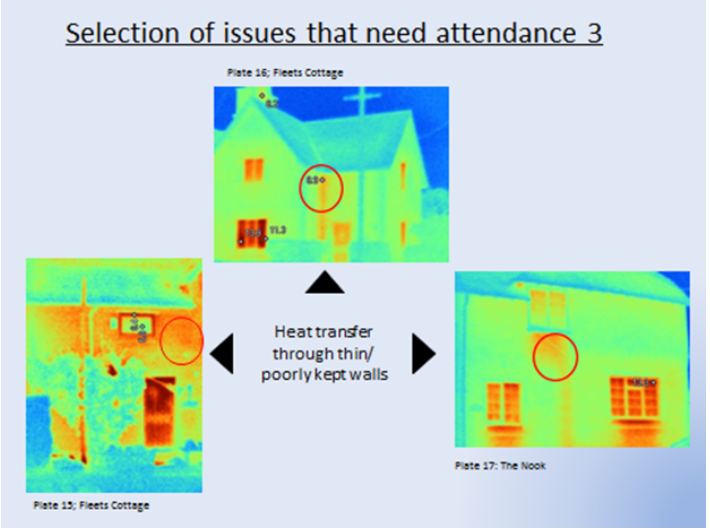
Other typical projects include: waste, awareness raising (Climate Change), travel patterns, vehicle usage

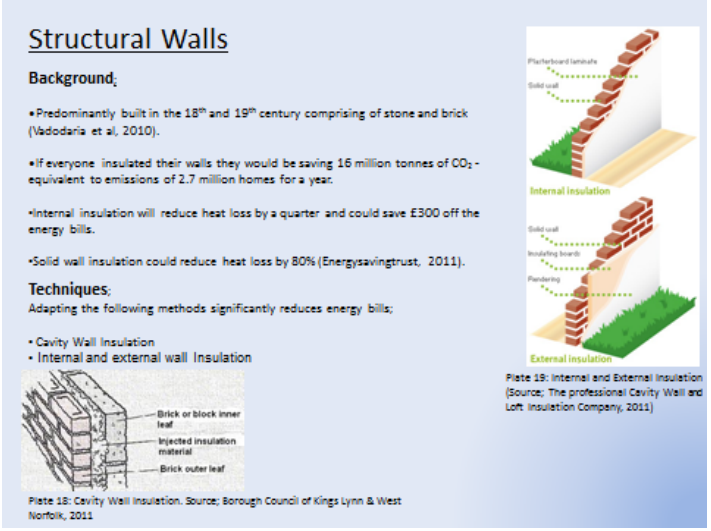


Thermal Imaging









Heating Patterns

Occupancy of University Houses (%)

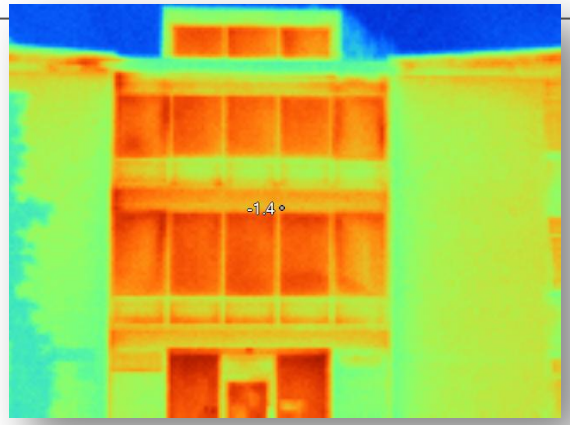
	9	10	11	12	13	14	15	16	17	18	19	20
Mon	45	32	41	64	32	36	36	36	36	59	41	55
Tues	55	41	36	41	18	18	23	36	50	55	59	64
Wed	55	41	50	64	55	59	55	68	73	77	73	77
Thurs	41	18	27	36	36	41	41	45	55	59	59	64
Fri	55	41	41	41	23	23	23	32	45	50	45	55
Sat	32	68	77	64	50	45	41	55	68	73	73	77
Sun	77	64	73	59	45	50	36	50	59	77	73	73

	21	22	23	0	1	2	3	4	5	6	7	8
Mon	73	68	77	73	77	77	68	68	68	68	68	68
Tues	73	73	82	91	95	95	100	100	100	100	100	100
Wed	68	73	77	77	77	77	68	68	68	68	68	68
Thurs	68	68	77	82	82	82	68	91	100	100	100	100
Fri	64	59	59	64	64	64	77	68	91	91	91	91
Sat	64	77	68	91	91	91	68	68	100	100	100	100
Sun	64	73	82	68	68	68	68	68	100	100	100	100

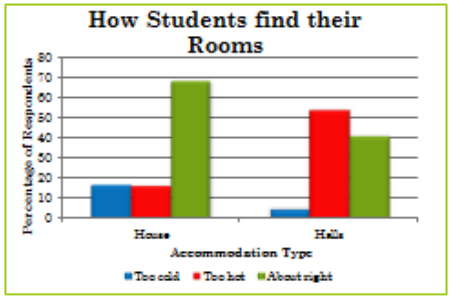
- The times of reduced occupancy tend to be:
  - Between 10:00am and 4:00pm (Monday – Friday)
  - Between 12:00pm and 5:00pm (Saturday and Sunday)

Key

Percentage	Colour
80-100%	
60-79%	
40-59%	
20-39%	
0-19%	



Question 3: How do you find your room?



The majority (68%) of those in houses find the temperature of their room about right for most of the time.

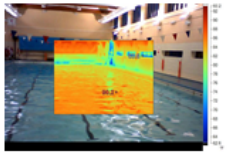
However, 54% of those in halls are too hot in their accommodation, with only 41% finding it about right.

A number of students in halls commented that they were unable to change the radiator in their room, leading them to become too hot.

Swimming Pool Cover

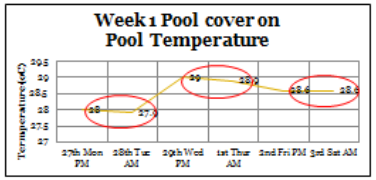
Sustainable swimming: Pool cover usage

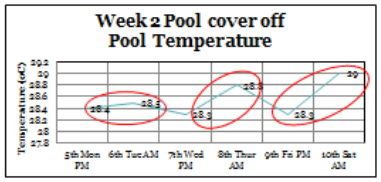
Josie Williams, Zoe Walden, Caroline O'Callaghan and Sarah Lowe



Pool Temperature

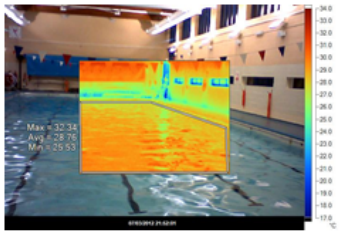
- The pool cover help maintain the temperature between 27-29.5degrees
- Only changed by 0.1 degrees when on
- Changed by 0.6 degrees when off
- Temperature rise when the cover is off
- This suggests that when the cover is left off the boiler works harder

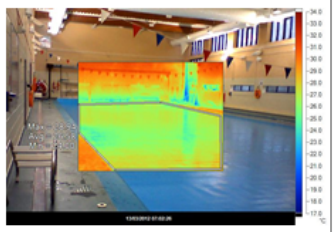




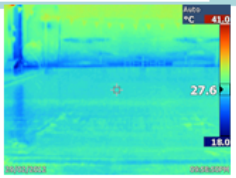
Thermal Imagery

- Infrared thermal imagery is a proven useful tool for assessing temperature fluxes quickly and efficiently (Chauvet, Cazin, Duru, & Prat, 2010)

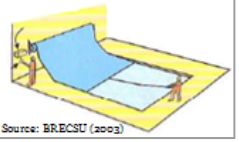




Interpretation



- Thermal imagery demonstrates the energy loss visually
  - Evaporation is shown to visually be reduced with pool cover on
  - Clear potential for reductions in energy waste
- Light fixtures appear to emit extensive heat
- Windows add to energy loss



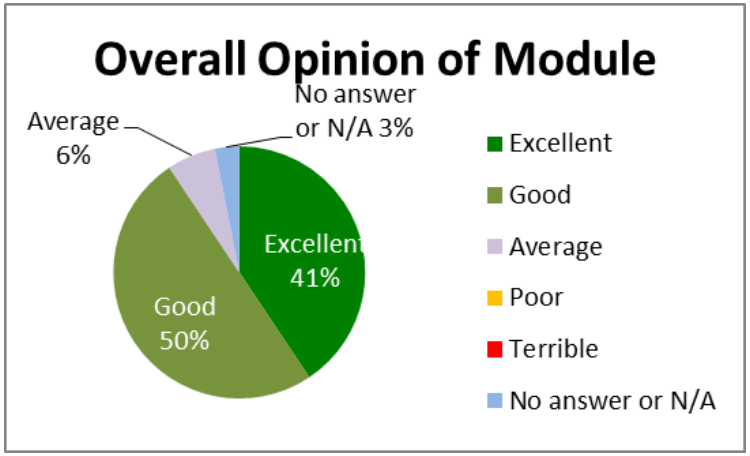
Source: BRECSU (2003)

Outcomes - Students

- Employability skills (presentation, communication negotiating projects)

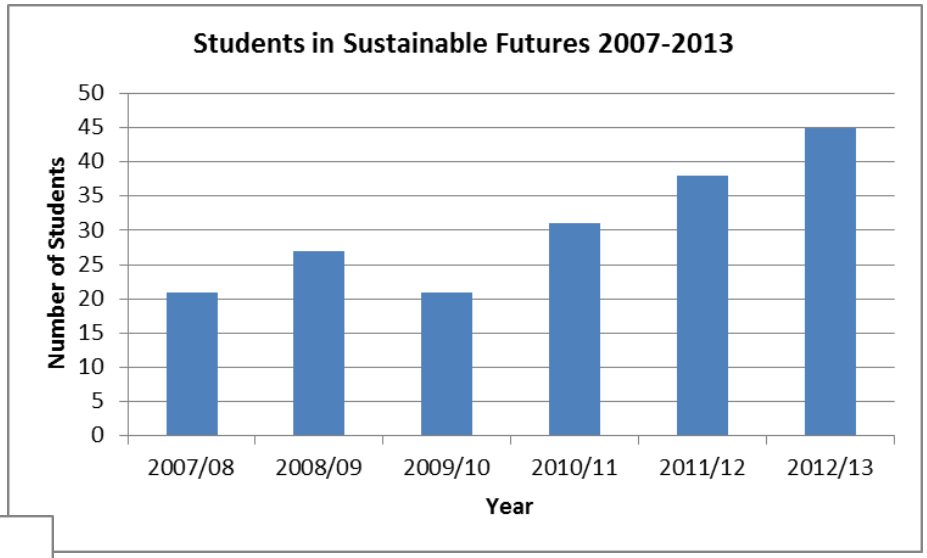
All previous examples are taken from student presentations.

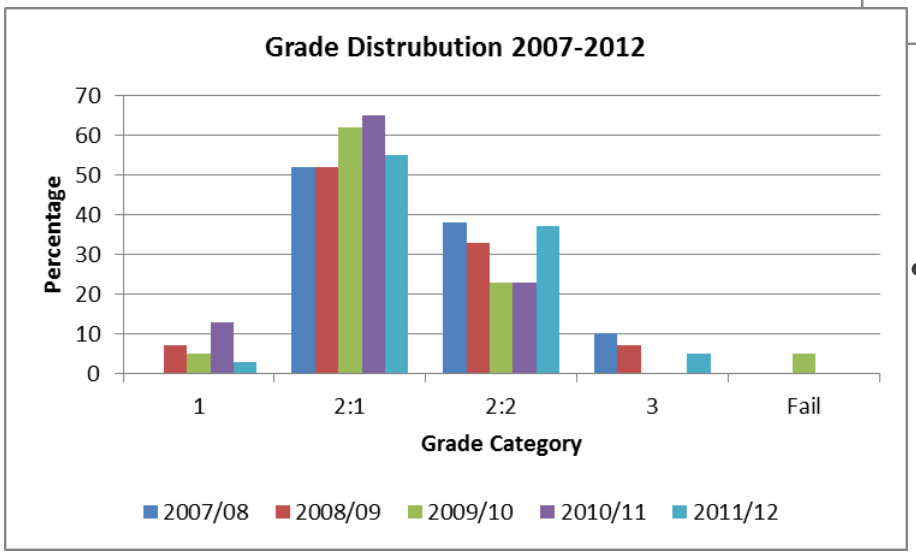
- Student feedback



Outcomes - Students

- Popular final year module





- Often one of the highest average module marks at final year

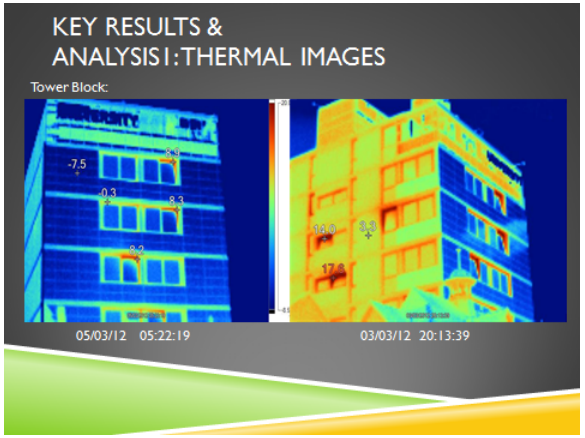
Clients

- Helpful in carrying out often exploratory work
- Collating evidence to inform changes
  - 2009 evidence from a project investigating the transport fleet led to changes in cars when the lease was updated
- See students in the outside community carrying out work

Clients

- “I was impressed by the commitment of all the students to their projects, the confidence in their own work that shone through in the presentations and their personal style - they looked good and were great ambassadors for the university. The work carried out on the tower cladding was as good as you'd get from consultants hired specifically, and paid munificently - I take my hat off to all of them.”

University Governor and member of Carbon Management Plan group who attended the 2012 presentations



Sourcing/managing Projects

- Networking in the local community: Local Authority Sustainability Commission, community groups
- Joint working relationships with local businesses
- Internal networking, especially Facilities Dept.
- Getting and maintaining contacts
- Project management
- ….. All take up staff time

Replication

- Nothing unique
- Any University with outreach in the local community/ business/public sector could replicate
- Plenty of willing customers!

Thank you

Any Questions?