

Sustainable Chemistry

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Course Context: Change

‘Traditional’ Chemistry Course

Dual Honours, Major Route

Major Curriculum Redesign:

- redevelop every module
- create Single Honours Route
- create new modules
- develop UG Masters (MChem)

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2nd Year Sustainable Chemistry v1

2013/14, full year.

No exam.

Focus on developing
transferrable skills
hand-in-hand with
chemistry knowledge.

Several aspects taught
through narratives.

Disjointed list of topics:

- polymer chemistry
- environmental chemistry
- industrial chemistry
- chemistry of gadgets

A Moment of Flippancy...

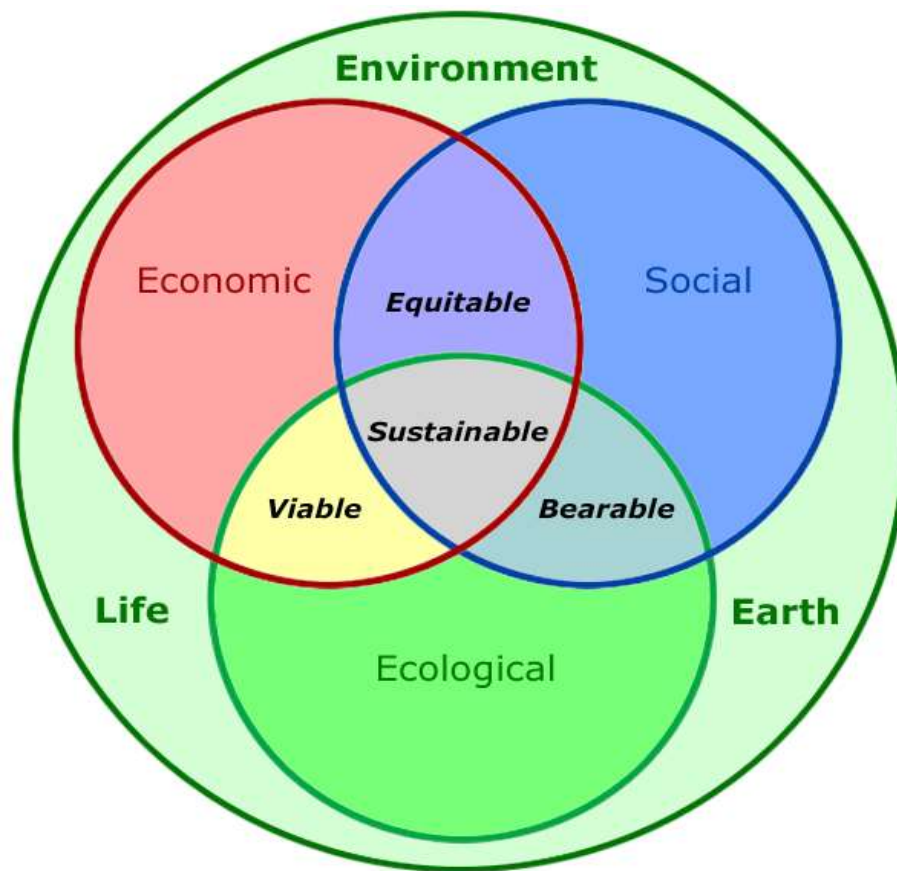
...and we called it
'Sustainable Chemistry'.

It was a 'theme' for the module.

Then we had no option but to
'do' Education for
Sustainable Development.



Chemistry Perspective





Foundations

Intro lecture on sustainability concepts

- thanks to Zoe Robinson and Phillipa Calver
- produced a toolkit of key issues.

Inclusion of relevant examples in other aspects

- biodegradable polymers
- environmental chemistry and life cycle analysis
 - focus on chemical perspective of a product
- 12 principles of green chemistry in the laboratory

Activities & Skills

Greening a 1st year laboratory experiment

Group work, experiment planning, delving into the 'economics' of the laboratory

Group and Individual Presentations

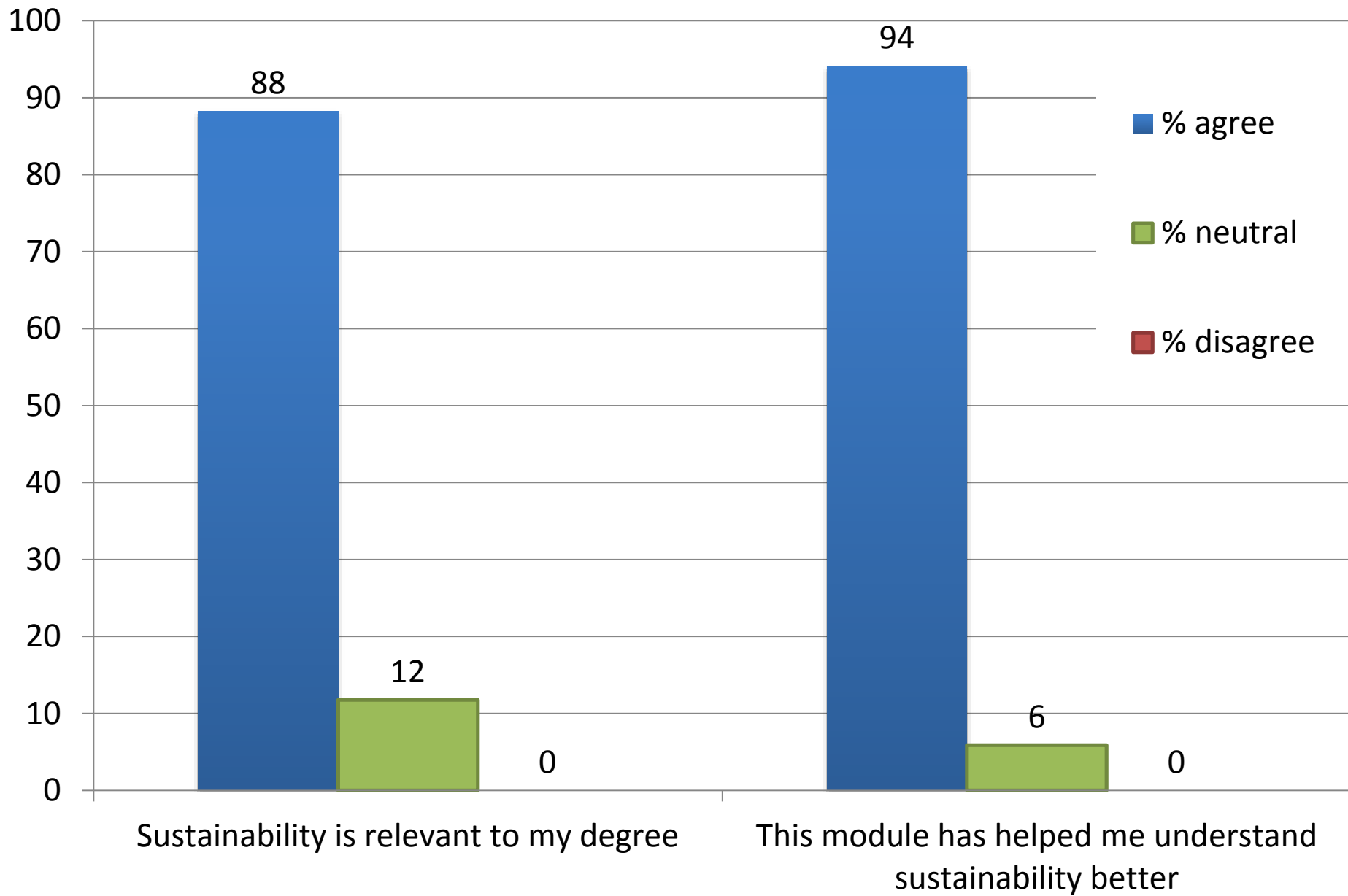
Group work, presentation skills (oral)

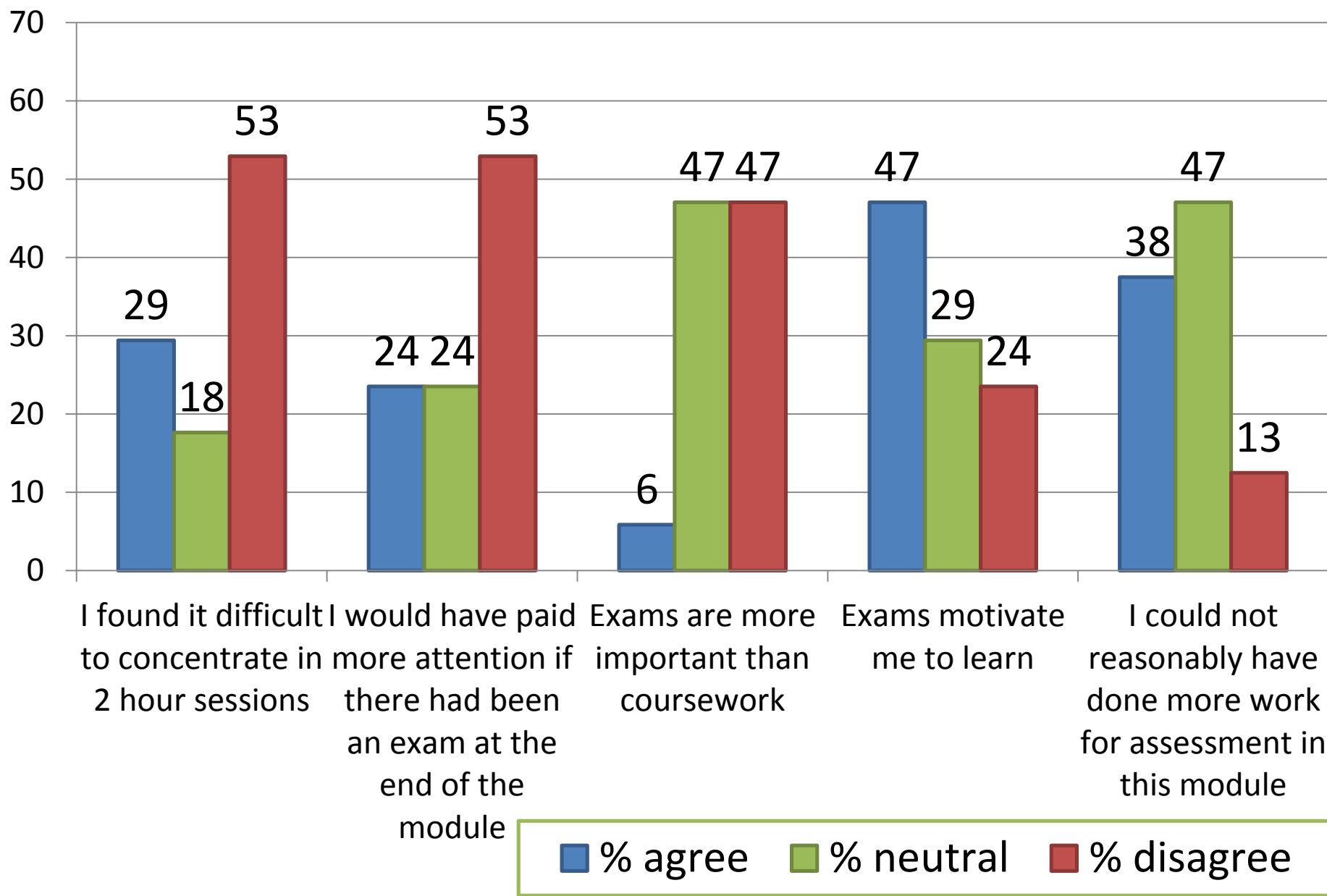
Life Cycle Analysis

Research skills (sources, referencing), writing (summarising)

Infographic, short written work, magazine article and poster

Presentation skills (written and graphical), writing (audience awareness)





Beyond 2nd Year (2013/14)

One Module IS NOT ENOUGH

- but access is a problem.

1st Year DKC Session

- skills with sustainability themes

1st Year Screencast

Presentations (15 %)

- last year 'any aspect' of chemistry.
- this year 'chemistry relating to sustainability or the environment'
- required scaffolding: intro lecture and DKC session



2014/15

One module becomes two!

No exams, focus on developing transferrable skills hand-in-hand with chemistry knowledge.

Sus. Chem. v2.0, 1st Year SH

Focus on sustainability and environmental issues related to chemistry.

‘Pump priming’ for the rest of the SH degree.

Industrial Chem. v1.5, 2nd Yr SH

Industrial topics with strong emphasis on sustainability...

- polymer chemistry
- chemistry of gadgets
- industrial processes



Lessons

Depressed students ('we're all gonna die')

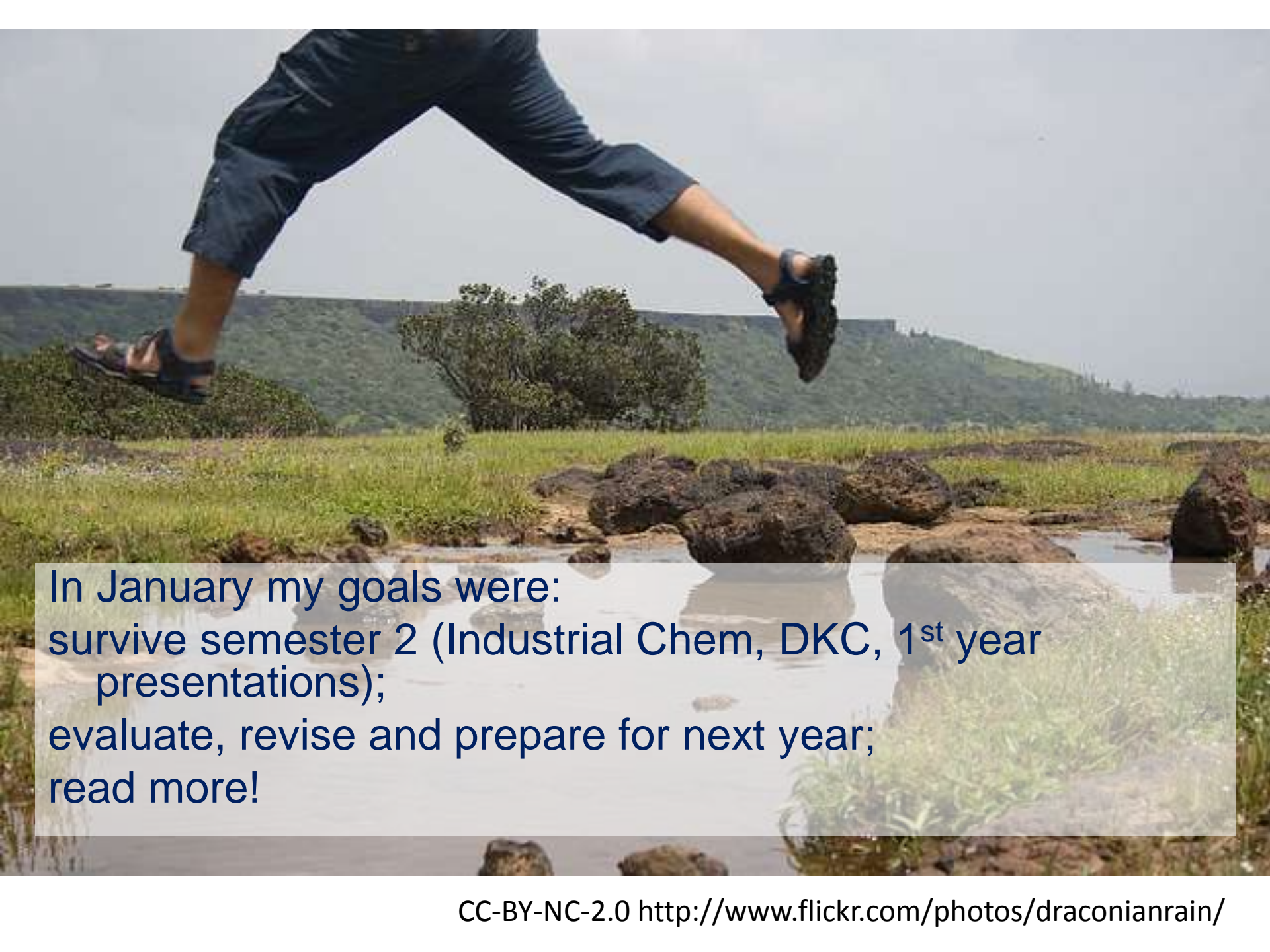
Extremely complex role of subject within sustainable development

- chemistry is both saint and sinner

Easy to consider the environment, harder to move deeper into issues

No exam, all coursework: rewarding but much harder work than 'standard' lecturing.

[hybrid of science comm. and teaching: must retain interest and attention]



In January my goals were:
survive semester 2 (Industrial Chem, DKC, 1st year presentations);
evaluate, revise and prepare for next year;
read more!



Now, the goals are:
reflect on evaluation (students and staff);
read A LOT more;
create more relevant narratives (holds attention better).



Acknowledgements

The Staff and Students of Chemistry at Keele

