

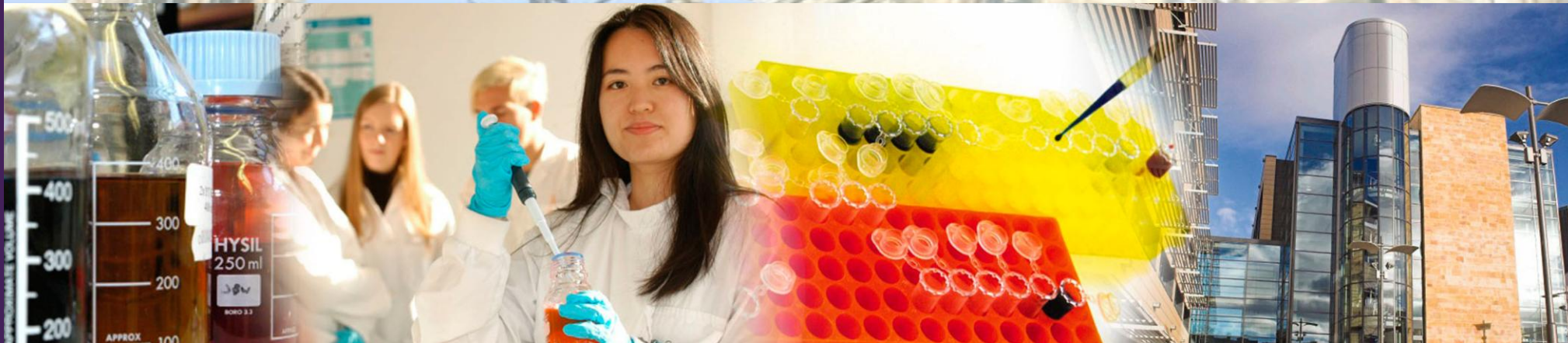


University of Glasgow | Faculty of Biomedical & Life Sciences

# Enquiry-based learning in a multi-disciplinary group

Anne Tierney

Biology Teaching Centre  
[a.tierney@bio.gla.ac.uk](mailto:a.tierney@bio.gla.ac.uk)





## Project

Enquiry based learning

Phases of the EBL project

Outcomes

## Developments

Exercises

Evaluation

## Why Enquiry Based Learning?

University of Glasgow Learning & Teaching Strategy  
2006-2010

- ‘Renowned internationally for enquiry-led learning in a knowledge culture that is shaped by the richness and diversity of our research environment’

### Advantages of using EBL

- Development of a wide range of abilities and skills
- Engagement with the subject/ out with the subject
- Deepening knowledge
- Student-centred
- Many resources (CEEBL, Kahn & O’Rourke, McMaster University)

## Summer Research – Phase 1

Four week full-time placement

Seven interns, from six  
faculties

Recruited from Years 1-3

Learning & Teaching Centre  
(LTC) facilitator

### Outputs

- Staff & Student Guide to EBL
- Website
- Posters

## EBL Developments – Phase 2

Two semester, part time

Six projects

Five interns participated on  
course simultaneously as  
student and developer

Two interns participated on  
course previously

Departmental/LTC contact

Staff recruited by various  
means

### Outputs

- Variety of EBL materials

## Guide

24 page booklet

Flip design

- Staff
- Students

Easy to read

Easily portable

List of other resources

## Website

Complementary to guide

More in-depth resources

## Posters

On campus

Highlight EBL

## Impact on the interns

Developed a close working relationship with one another

Increase in confidence

Related this experience to other areas of study

*'I had such a good experience working in a group and it really changed the way I work in a group now.'*

*'I found it really strange... sitting in a group and there were lecturers... and professors asking me questions... and I think, getting over that was a big, big thing.'*

*'I have adapted it a lot to my other studies. I'm taking my courses a lot more seriously.'*

## Project

Two interns working together

Development of a range of activities for first year students

Tie in with new group activity – Biological Molecule Poster

## Outcomes

Interactive lecture - ethics

Microscopy exercise (summer school)

Enzymes exercise

## Developments

### Interactive Lecture

- Interns worked with member of staff
- Incorporated questions to the audience into the lecture
- *Use of Personal Response Handsets in the future?*

### Microscopy exercise

- In depth instructions on use of microscope incorporated into pre-lab lecture
- Students decide the focus of their lab report
- Students begin to relate topics to one another

### Enzymes exercise

- Introduction to enzymes: Biological Molecule Poster
- Uses former knowledge of subject
- Creates a picture of gaps in students' knowledge

## Questionnaire & focus group

This exercise made the topic more interesting

– 96% of respondents agreed/strongly agreed

The exercise makes me want to find out more about the subject

– 59% of respondents agreed/strongly agreed

*‘You don’t usually get to hear what your classmates think, which was interesting.’*

*‘It made me think more in depth about the subject & what’s right rather than just accepting it.’*

## Observations

Demonstrators reported that students were more competent

- Using microscopes
- Making connections
- Making use of resources

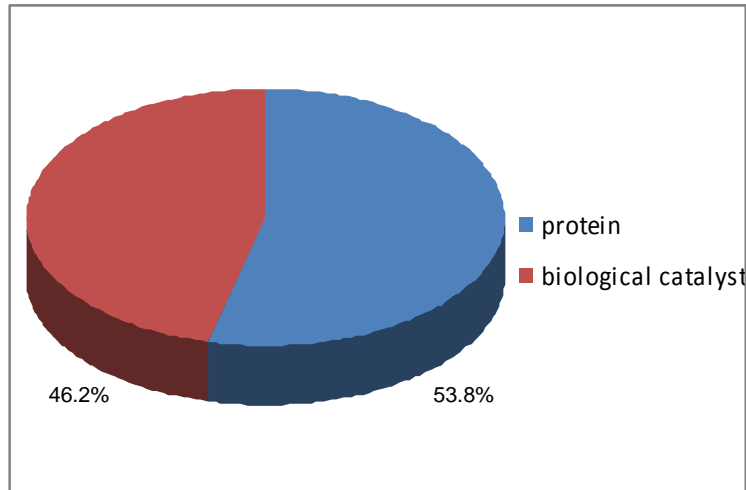
Lab reports were more interesting to mark

- Each one was unique
- Students followed a line of enquiry interesting to them
- Students' thought processes were incorporated into the reports
- Students justified their choices throughout the exercise
- Students co-operated with one another
- Students began to make connections outside the remit of the exercise

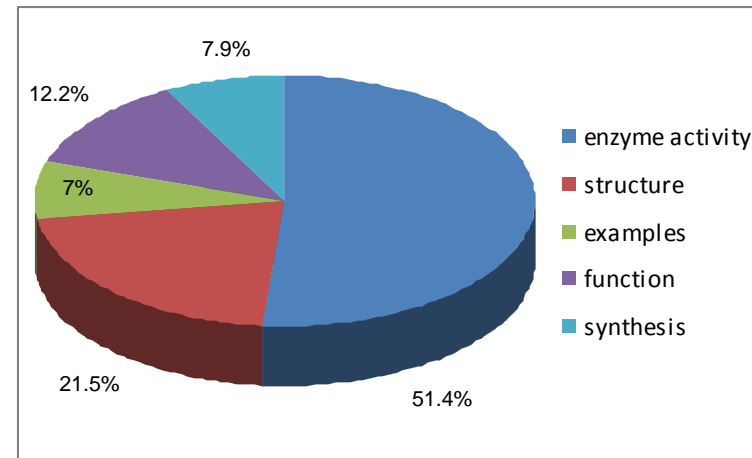
## Data analysis

553 students, 168 groups in 14 labs, 635 post its, 1280 discrete pieces of data

*What is an enzyme?*



*How much do you know about enzymes/proteins/biological catalysts?*



- Students focused on enzyme activity & structure (72.9%)
- Few gave examples (amylase was the most popular)
- Students were weak on function and synthesis

## Focus groups

One of the interns held two focus groups with students

- Students wanted to design their own enzyme experiments
  - *‘It would be difficult but it would be a challenge – it gets your ideas flowing and helps you understand more’*
  - *‘Get more in depth with competition for enzymes and inhibition’*
  - *‘I know at Honours you have to design your own project – it would be helpful to get into the mindset’*
- Students would like to be assigned molecules for the poster or choose from a list, and carry out experiments based on the molecule
  - *‘Then at least you know that the molecule has a level of significance that you can research to a certain level and produce a decent poster’*
  - *‘It would make the poster a whole lot more interesting... if a whole lab was dedicated to gathering poster results... you could have two weeks gathering results and it would make it more involved’*

## Enquiry-based learning

Working in the intern group was a positive experience

Group working

Working with students in other disciplines

Finding out similarities and differences between disciplines

Students benefit from exercises that give them freedom to make decisions

Allows students to go into a subject in more depth

Students and interns have more ownership of learning

Madeleine Bridges, Jacqueline Carroll, Alistair Hood, Daisy Hope, Elisabeth Storck, Kate Thomson & Jamie Wisbey

Jane Pritchard (University of Bath)

Level One Biology Team, University of Glasgow

HEA Centre for Bioscience

## Resources

**Beckett, D. & Hager, P.** (2000). Making Judgments as the Basis for Workplace Learning: Towards an Epistemology of Practice, *Int. J. of Lifelong Education*, 19:4, 300-311

**Centre for Excellence in Enquiry Based Learning, University of Manchester:** [www.campus.manchester.ac.uk/ceeb/eb/](http://www.campus.manchester.ac.uk/ceeb/eb/)

**Centre for Leadership in Learning: McMaster University, Canada** [www.mcmaster.ca/cll/inquiry/whats.unique.about.inquiry.htm](http://www.mcmaster.ca/cll/inquiry/whats.unique.about.inquiry.htm)

**Kahn, P. & O'Rourke, K.** (2005) 'Understanding Enquiry-Based Learning' Handbook of Enquiry and Problem-based Learning Irish Case Studies and International Perspectives, AISHE, Terry Barrett, Iain Mac Labhrainn and Helen Fallon (Eds), pp 1-12

**Lave, J. & Wenger, E.** (2002). "Legitimate peripheral participation in communities of practice" from: Lea, M. R. & Nicol, K. (eds) *Distributed Learning Social & Cultural Approaches to Practice*. London and New York: Routledge Falmer, 56-63