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**Our First Steps in
Enquiry-Based Learning
in Chemistry**

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Contents

- **Enquiry-Based Learning**
- **Project Aims**
- **“Down The Drain” Scenario Trial**
- **Future Work**
- **Acknowledgements**

Enquiry-Based Learning (EBL)

- **Broad umbrella term for learning approaches driven by a process of enquiry**
- **e.g. Problem-Based Learning, Case Studies (in conjunction with Industry?), Investigations, Individual / Group Projects, Research Activity**

Characteristics

- **Strongly student-centred.**
 - **students follow their own lines of enquiry**
- **Group work**
- **Involves active learning**
- **Promotes deeper learning**
- **Shift from tutor to facilitator**
- **Open-ended and ill-structured**
- **Based in the “real world”**

Types of EBL

Problem-Based Learning

A learning activity that is organised around achieving a shared goal in group work

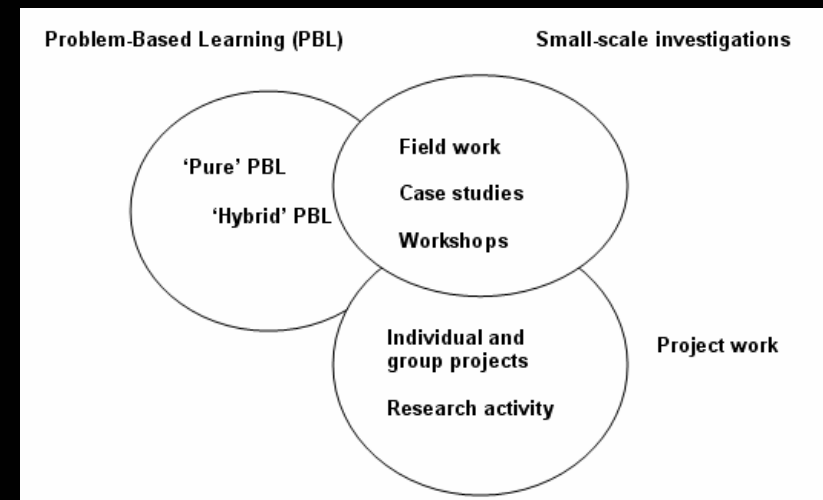
Project-Based Learning

Focuses on the endpoint (e.g. dissertation)

Small Scale Investigations

e.g. case studies

<http://www.aishe.org/readings/2005-2/chapter1.pdf>



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Project Aims

- **Examine student and staff expectations of learning**
- **Audit and evaluate current teaching practice within entire curriculum (lecture- and lab-based)**
- **Examine good practice in EBL**

- **Review Educational Literature on EBL, especially within Chemistry and Physical Sciences**
- **Additionally review student-centred learning approaches in HE**
- **Devise, pilot and monitor novel teaching approaches incorporating EBL, guided by Working Group**

Down The Drain Trial



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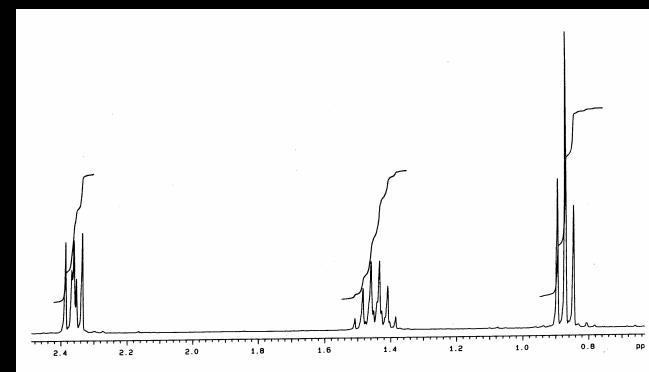
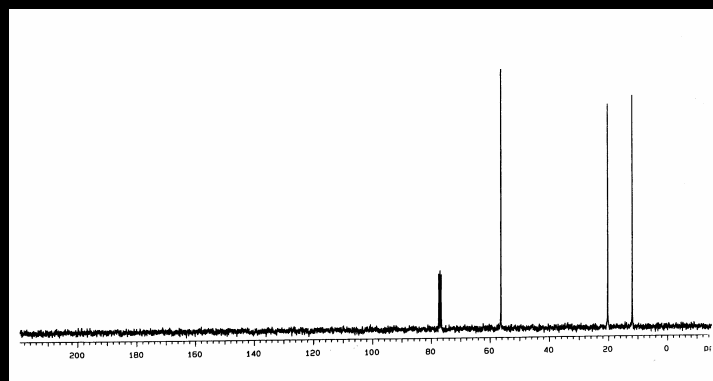
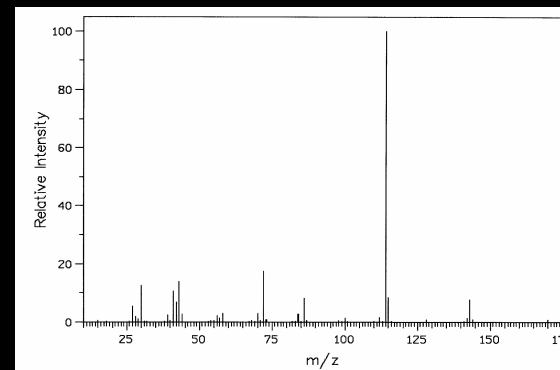
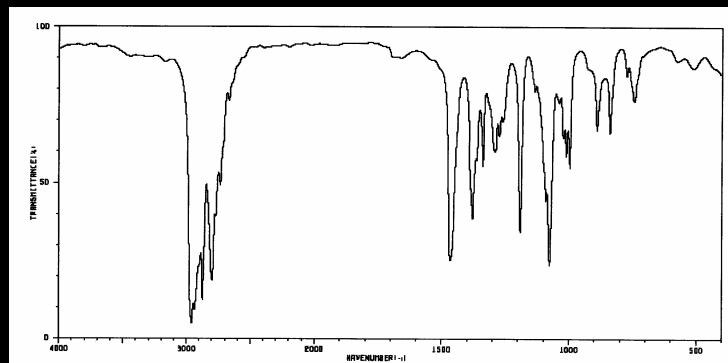
Scenario



- The Environmental Science Department has now completed the collection of samples from the river near the University of Rummidge
- 8 compounds have been analysed by ^{13}C , ^1H NMR, and IR spectroscopy and also by Mass Spectrometry
- An analysis report and subsequent briefing paper are requested

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Compound A



Facilitation and Assessment

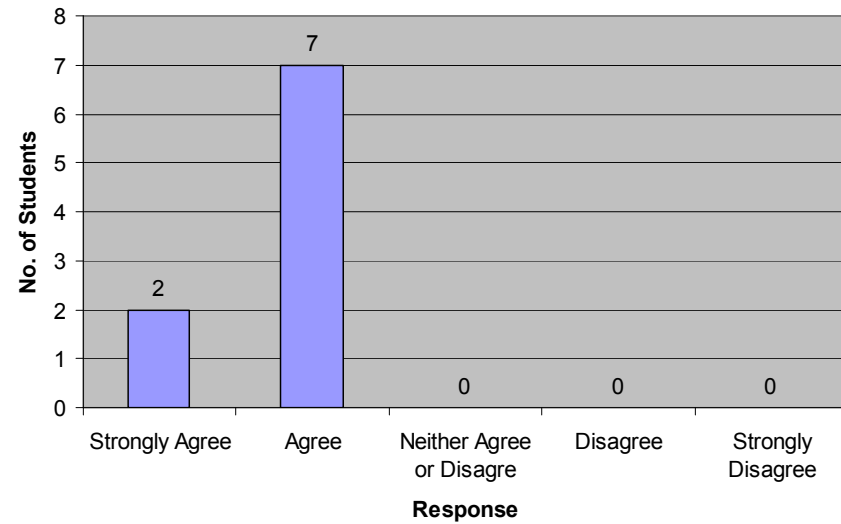
- Online facilitation for groups
- One week to complete exercise
- Each group produced online summary of how each technique worked and type of information produced by technique
- Individuals presented spectral interpretation and identification of unknowns on OHP

Evaluation

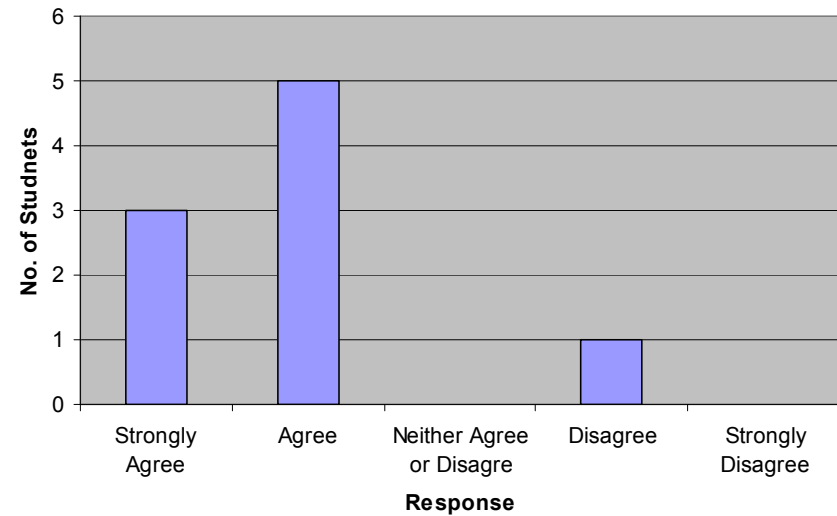
- “Divide and conquer” technique used
- Online Discussion Board not used as we had planned
- Students did not ask for any additional information
- Task completed remarkably well

Feedback

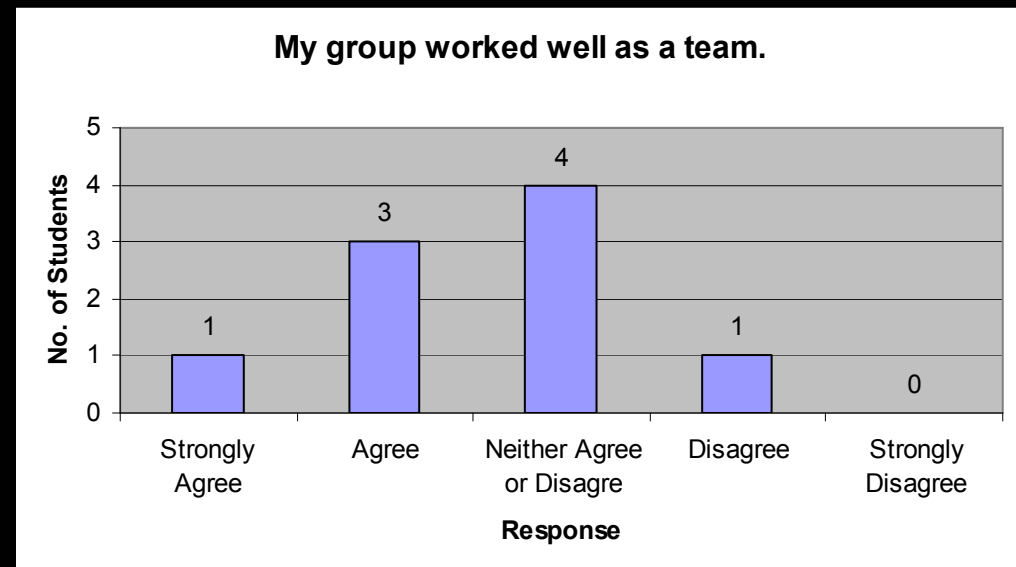
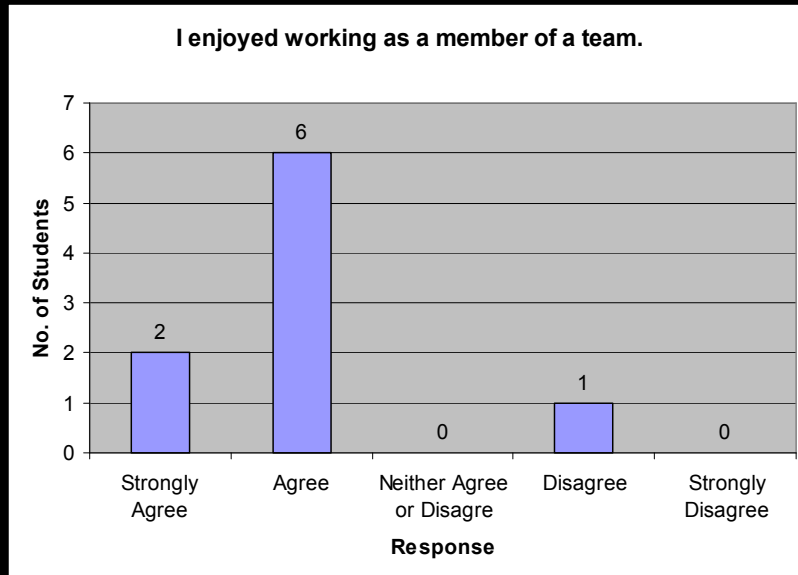
I felt that I understood the learning process in this activity



I enjoyed working in this way.

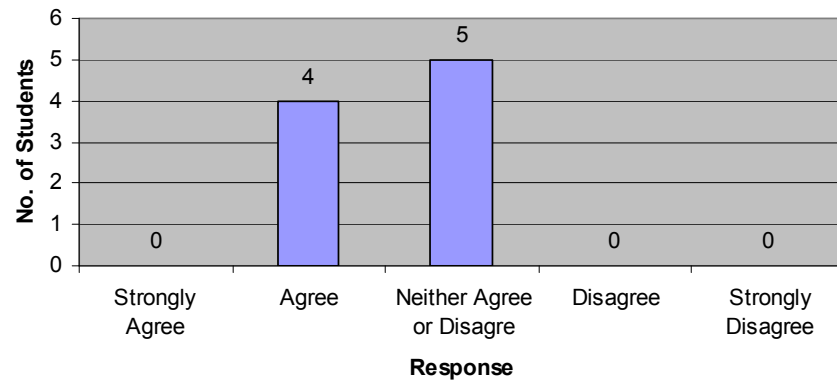


Feedback

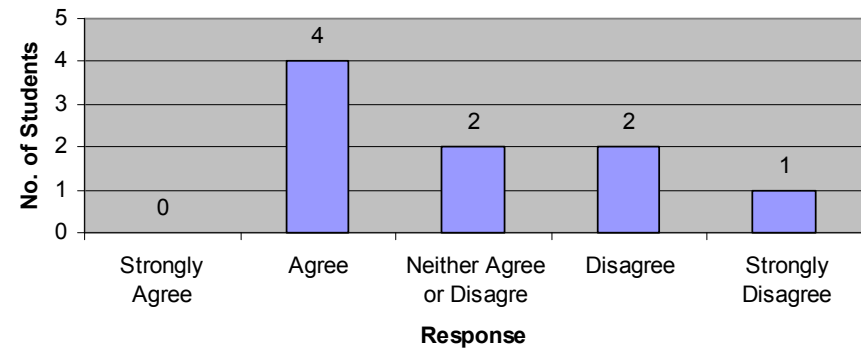


Feedback

The group appreciated my inputs.

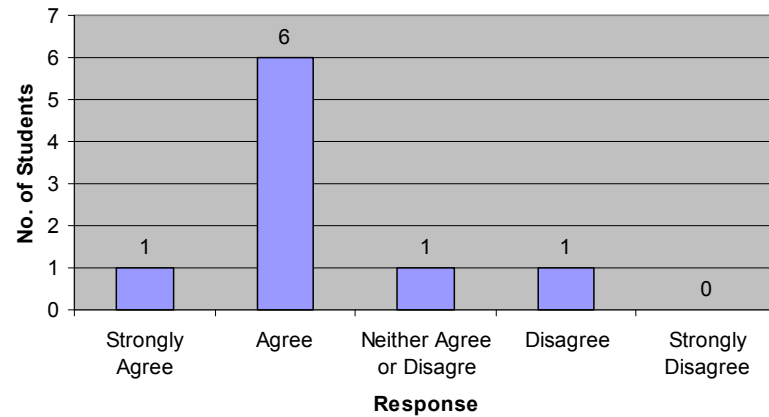


The group worked well to overcome any difficulties or problems we encountered.

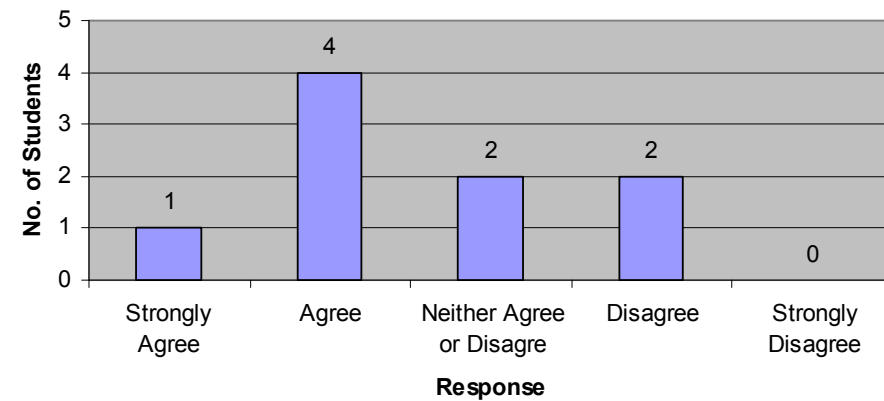


Feedback

I found the team members to be helpful in my learning.



The group was effective in developing shared goals.



Future Work

- **Introduce EBL in Induction activities**
- **Roll out Spectroscopy scenarios next Academic Year**
- **Devise more scenarios for use with other modules in different years of study**
- **Try to get industrial input to scenarios to ensure authenticity and appropriate forms of assessment**

Acknowledgements

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