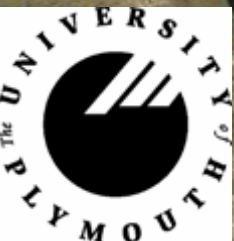


Bioscience student conceptions of experiential learning and the implications for skills development

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Experiential
Learning CETL
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Overview

- The EL CETL
- Experiential Learning Environments
- Benchmark statements
- Methodology
- Skill definition
- Results
- Discussion
- Conclusions/future work

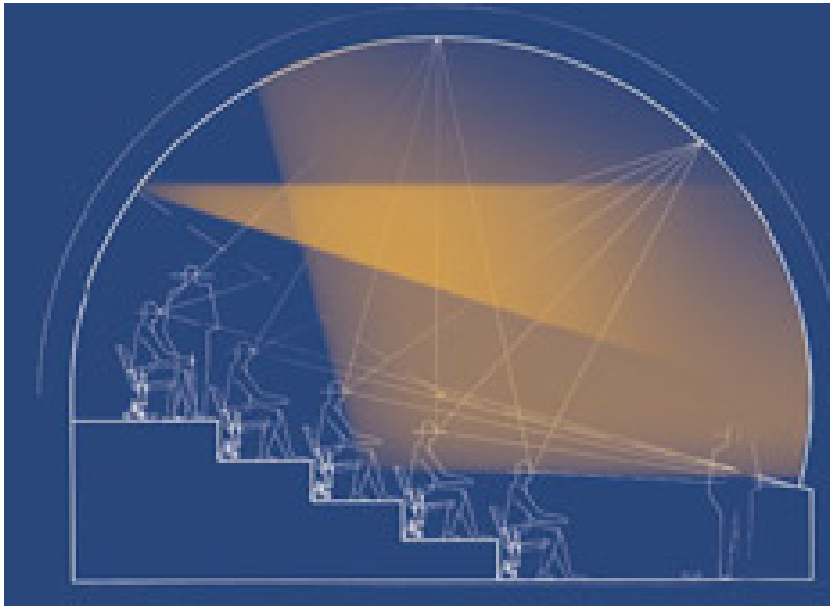
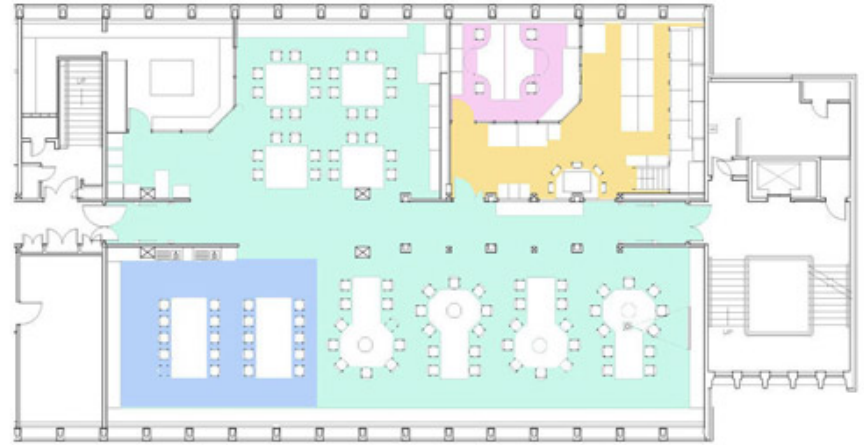


Research

- Conceptions survey across all EL CETL disciplines

Development

- Immersive vision theatre
- Lab +



Types of experiential learning environment



- **Fieldwork**
- **Labwork**
- **Work-based learning**



“The development and place of **skills** and capabilities in the curriculum have been major aspects of the higher education agenda for more than 10 years. During this time developments and shifts of emphasis have occurred, influenced by debates at both national and institutional level. There has been an increasing emphasis on **student experience**, focussing not only on the **development of academic and intellectual capabilities and subject knowledge**, but also on the **development of skills to equip students for employability.**” (Nobel, 1999).



‘Laboratory classes, fieldwork and computer sessions support learning in scientific approaches to discovery, practical experience, opportunities for acquisition of subject-specific and transferable skills, and reinforcement of the taught curriculum.’

‘Many of the degree schemes enable the development of general skills and competencies suitable for the world of work in which the focus is not biology.’

‘The specific graduate and key skills that should be developed in bioscience degree courses are subdivided into the following headings, intellectual, practical, communication, Numeracy, communications and information technology (C & IT), interpersonal and teamwork, self-management and professional development skills’

(Biosciences Benchmark Statement, 2002)



Methodology

- Initial phase of a three year longitudinal study which began in September 2006 with an open ended questionnaire to students.
- In Marine Biology (referred to as biology) we received a total of 60 responses from the students, 75-80% response rate. Staff questionnaire online with 50% response rate, around 17 in total. Results were analysed qualitatively and quantitatively.
- **Qualitative research:** main conceptions identified with reference to the development of skills
- **Quantitative research:** how the proportions of students and staff holding each conception vary.



Results (i) Skill definitions

Skill	Definition
Intellectual skills	Recognising and applying theories and concepts, analysing, summarising information critically, research, when a student is designing and planning an investigation.
Subject specific skills	Skills intrinsic to the area of study. e.g. agar plate preparation.
Dissemination and I.T. skills	Communicating about the subject to a wider audience, preparing, processing, interpreting data using qualitative and quantitative techniques and statistics, use of the computer and internet to solve problems, publishing reports.
Practical skills	Collection, analysis and interpretation of data in the field and lab.
Teamwork skills	When a student is able to work collectively inside and outside the classroom with fellow class mates. They are able to recognise and respect the views and opinions of fellow classmates
Employer related skills	When a student specifically mentions employment or refers to their future career prospects. They may refer to other skills listed here but in the context of being beneficial to an employer.
Miscellaneous/other	When the student does not refer to any skills



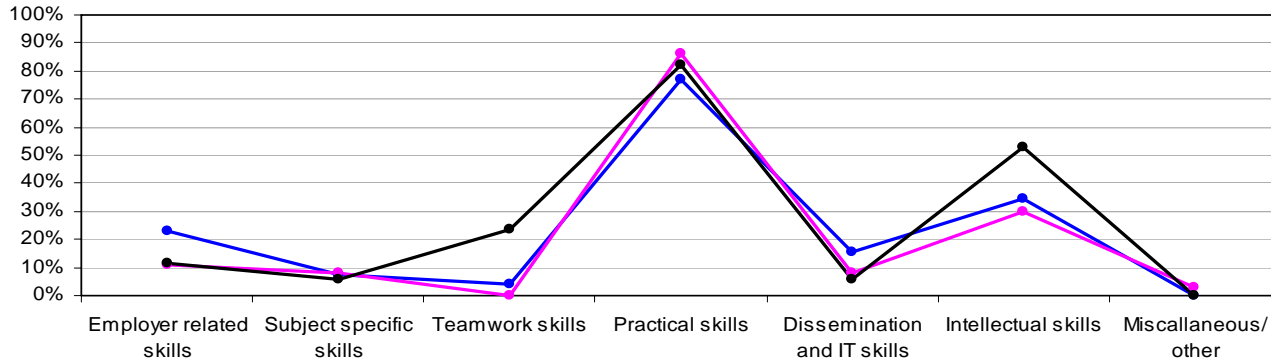
Results (ii) Qualitative

What do you think is the main purpose(s) of fieldwork?	Employer related skills	Subject specific skills	Teamwork skills	Practical skills	Dissemination and IT skills	Miscellaneous/ other	Intellectual skills
To gain skills and experience working in a team in the field, will be useful when I need to get a job, all the skills learnt will help me in my career	1		1				
To allow the student to practice skills for future work, and make it more interesting. All the material learnt in lectures will help when out in field for analysis skills	1						1
To gain hands on experience in the field which will enable more effective learning and skills which can be required in future employment.	1			1			

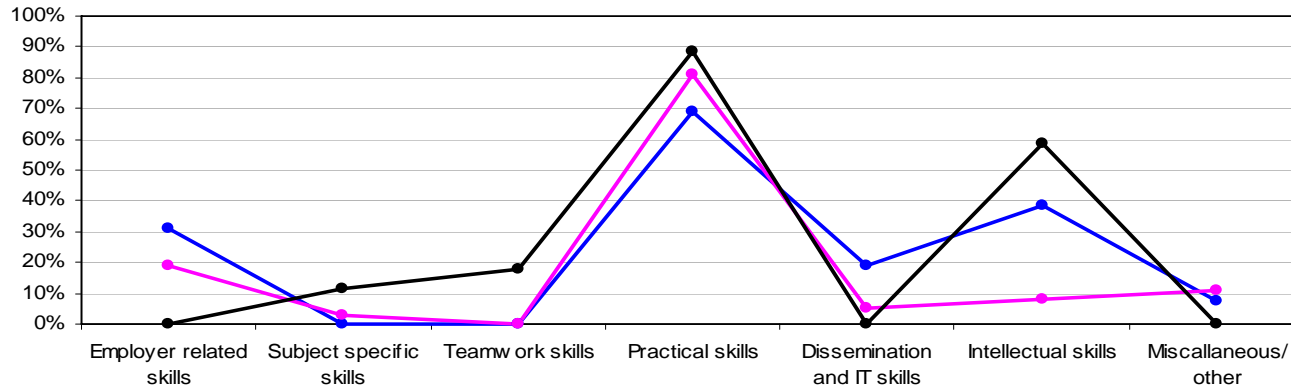


FIELDWORK

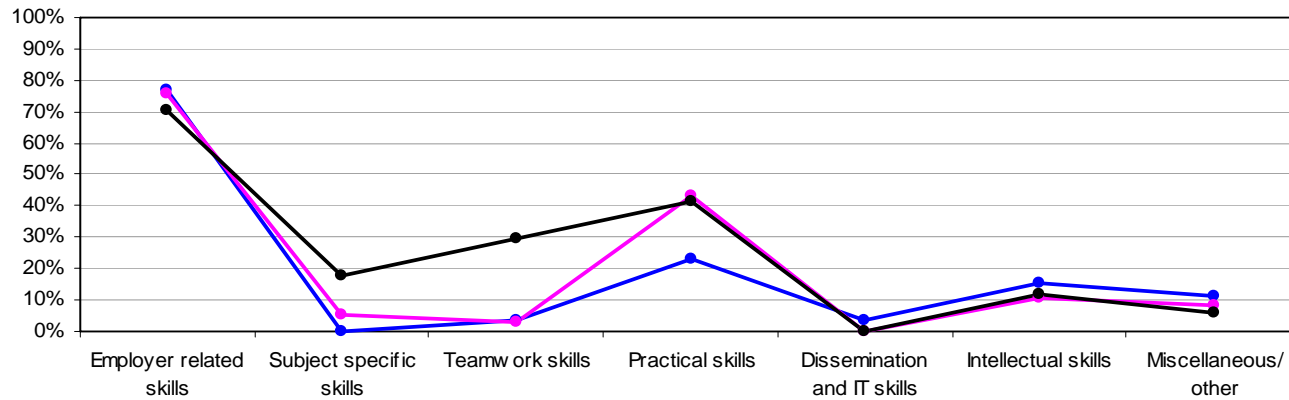
— Stage 1 — Stage 3 — Staff



LABWORK



WORK BASED LEARNING



Discussion

- The development of **practical skills** is important in all three learning environments, which is consistent in what the benchmark statement says.

‘Demonstrate ability in a range of appropriate practical techniques and skills relevant to research in biosciences. This will include the ability to place the work in context and to suggest lines of further investigation....’
(*Biosciences Benchmark Statement, 2002*)

- With focus being on the development and mastery of **practical** skills in the field and laboratory this suggests there will be many careers that involve working in a laboratory or in the field, opening up the employment opportunities. These results are consistent with what is said in the benchmark statement that:

“The Biosciences are essentially practical and experimental subjects. Consequently appropriate opportunities to participate in collecting data by undertaking experiments and practical investigation (e.g. fieldwork for field biologists and lab studies for most other groups) are integral to any scheme of study in that area.”

(*Biosciences Benchmark Statement, 2002*)



Conclusion/Future

- The CETL will enhance and extend an existing work based learning module aimed at Stage 2 bio-scientists.
- Investigation of skills development will be extended to the other CETL disciplines (environmental science, geography and geology).
- Students will be continually monitored as they progress through the academic stages. With the development of new work based learning modules and new field locations, will the students' skill development be more comprehensive?

