Enquiry Based Learning For Biology

What are the aims of this project?

The aim of this project is to promote learner autonomy by applying enquiry-based learning (EBL) approaches to modules in the biology course. This project will build on preliminary development of modules in plant biotechnology and sociobiology.

Specific objectives are:

- Analysis of module materials to identify areas for development.
- Preparation of an evaluation strategy.
- Involvement with external industry experts to enhance employability.
- Linking research and learning.
- Training PhD students to support EBL groups.

The outcome will be EBL-based modules that are fully developed and evaluated such that EBL approaches can be disseminated more widely through Bioscience and SHU.

What is the background / rationale?

Traditional teaching in Biosciences follows a lecture-based approach, which is tutor-centric and doesn't emphasise learner autonomy. In contrast, Biosciences lecturers possess strong research backgrounds that are based on understanding and building new knowledge through enquiry-based approaches. To maximise the transfer of these skills and develop learner autonomy it seems natural to move towards enquiry-based approaches for module delivery. Expected outcomes are that students will learn biology in a deeper and more coherent manner, promoting quality learning and the acquisition of stronger transferable skills. The EBL expertise developed in these modules will be transferable to a wide range of modules across Biosciences and more widely in SHU.

What are the benefits to student learning?

Student development depends on their ability to construct understanding through analysis and investigation. EBL provides an opportunity to embed such training into science modules. Students will benefit from a more engaging form of learning, which will draw on key strengths of tutors with research expertise. An immediate benefit for students will be improved preparation for their final year project, which depends heavily on learner autonomy; these new EBL-based modules will act as stepping stones. Ultimately, the EBL approach will enhance employability through enhancement of key skills such as research, problem solving, group work,

presentation, and application of knowledge. The modules also include direct links with potential employers in research and industry.

Studies highlight the value of EBL in research-informed teaching, and could thus be an effective means of meeting the SHU aspiration to integrate research into teaching. Therefore, it is important to build our capacity in EBL and thereby derive benefits from available research expertise.

How will this project be evaluated?

Evaluation is a key element of the modules in their early stages, to refine the specific modules and to learn more general lessons about how to implement EBL. The development of a detailed evaluation strategy is part of this proposal, but it will focus on:

- Student feedback; questionnaires, focus groups, comparison of assignment quality with similar modules, how well the learning supports subsequent modules.
- Tutor evaluation; reflection on individual sessions, assignments, student engagement, student progress.
- Comparison to other studies; analysis of the literature.
- Effect on project module.
- Skills directly applicable to employment from biotech industry to teaching.
- Development from 'A' Level to post graduation.

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