Linking Teaching with Research in the Disciplines

Case studies for Courses and Course teams

Taking learning into the field

Contact details

Dr Julian Park
School of Agriculture, Policy and Development
The University of Reading

***Tel:* 01189316686**
Email: j.r.park@rdg.ac.uk

Classification Category:

- *Developing student appreciation of research in the discipline*

Context:

- **Course/unit/module title: Rural Environmental Science in Practice**
- **Course title: BSc Rural Environmental Science**
- **Level: 1**

What does the teacher do?

This core module is designed to introduce students to basic research techniques and research issues associated with Rural Environmental Sciences using existing research projects and themes in the School and via field visits to local research institutions. This concept is underpinned by the high research rating (5) of the School of Agriculture, Policy and Development from which the degree is co-ordinated, the availability of on-going research projects and the geographic position of the University of Reading which provides access to a number of high quality research institutes relevant to the degree subject. The actual background to activities that a given cohort of students pursue changes as different research projects are completed and new contracts won. This gives a dynamic background to the module which ensures students are being associated with the latest research projects.

Course aims

To develop students understanding of field experimentation, monitoring and lab techniques via research within the university and at other local institutions. Additionally the module aims to provide students with the knowledge of the career opportunities that are available to them.

Assessable outcomes: by the end of the module students will be able to

- Design and undertake environmentally related experiments and monitoring in the Rural Environment
- Describe the function of a number of environmentally oriented research organisations and the usefulness of the work they undertake
- Conduct a range of field and laboratory work in a professional and safe manner.

Assessment for the module is based around a field diary in which experiments and visits are written up and a presentation relating to one of the activities undertaken

Sessions: *Research activities*

As discussed the actual on-going research projects that provide the context each year do change, although the learning objectives will principally be the same. The outline given below is based on examples of the way recent research has been used to support learning.

Landscape Evaluation: The School has been involved in a number of projects relating to land use and landscape change. This year a recent research project relating to the Chilterns Area of Outstanding Natural Beauty has been used as the basis of a landscape oriented session. Full research report is available at http://www.english-nature.org.uk/about/teams/Pubs.asp?Id=5. Students are given an overview of the geographic area and we spend half a day driving around the area looking at key landscapes and habitats. Students are introduced to simple techniques for landscape evaluation and undertake a simple landscape evaluation with the aim of illustrating how each individual has a different perspective of landscape.

Experimental Design: In part I students are exposed to a number of issues associated with experimental design relating to research within the Department. This practical can be linked easily to an on-going research project where students can see plot layouts or experimental design features. For example, in the past students have explored the design of intercropping experiments, the design of a shelterbelt for research purposes, an agroforestry experiment and chalk grassland restoration.

Glasshouse and laboratory introduction: The School has been involved in a number of projects associated with assessing soil seedbanks. In this project students undertake soil seed bank sampling in a variety of habitats (woodland, arable, grass ley, flood meadow). Samples are analysed using wet sieving techniques and germination trials. The work is linked to existing research being undertaken in the School which is using these techniques. The project aims to expose first years to good practice in both the glasshouse and lab. This practical is available on the LTSN Compendium at http://bio.ltsn.ac.uk/imagebankuploads/compendium/

Ecological monitoring: This is been taught via links with the staff in the Centre of Agri-Environmental Research here at Reading. They have a number of projects involving the monitoring habitats and one of these sites is used to provide an introduction to invertebrate sampling methods. Students use a variety of sampling methods (Vortis suction sampling, pitfall traps, funnel extraction and bucket traps) to sample sites and then undertake sample analysis in subsequent weeks. The exercises are usually supported by the Centre research staff and students are provided with an introduction to the work of the Centre and a range of on-going projects.

Sessions: *Visits to Research Institutes*

The combination of visits varies from year to year but the following give some idea of the diversity of research visits that may be undertaken. Students are usually given a specific question or objective to pursue from the visit in relation to their field diaries.

Environmental Change: Students are taken on a field visit to Wytham Woods which is one of the Environmental Change Network Sites. It is also one of the Oxford University Field Stations. See http://www.ecn.ac.uk/sites/wytha.html . Wytham is an ancient semi-natural woodland, grassland and experimental farmland on Oxford Clay, Calcareous Grit and Coral Rag. Long-term records exist on many topics, especially on populations of oak tree insects, and on birds and small mammals. As well as the ECN monitoring students are exposed to a range of experiments relating to climatic change, habitat succession and plant -animal interactions. Several students have returned to Wytham later in their University careers when undertaking their final year dissertations.

Invasive Species: Students visit the Aquatic Weeds Research Station which is based close to Reading. Here they are given an overview of issues associated with aquatic weeds and the current research being undertaken in this area. They are given an insight into the current research being undertaken at the Centre. See http://www.iacr.bbsrc.ac.uk/pie/JonathanGrp/JonathanIndex.html

Forestry strategy and research: Students visit the Visit to Alice Holt Research Station to get an overview of forestry strategy and research in the UK. See http://www.forestry.gov.uk/forestry/HCOU-4U4HZM. The visit involves talking with leading forestry researchers. This is a day long visit with the afternoon including a visit to the Selbourne "hangers" which are important wooded areas in Hampshire.

Landscape and Habitat priorities and research: Students visit the English Nature regional office at Greenham Common. The students are given an overview of national EN priorities, research and targets before touring an important heathland restoration project on the old Greenham military base. See http://www.english-nature.org.uk/about/teams/Teams.asp

Protected Landscapes: Students visit the Warburg Nature Reserve near Henley where they are given a guided tour and overview of the site by the reserve warden. The reserve contains many important habitats such as ancient woodland, chalk grassland and coppice areas. It is also home to a number of nationally important species. Students get an insight into the on-going monitoring on the site and are exposed to research possibilities. see http://www.wildlifetrust.org.uk/berksbucksoxon/warburg.htm.

Hot tips and things to look out for:

In terms of research going on within the School it is important to identify projects which are not too complex in the first instance. Further, if current researcher are to be involved in the execution of the activity it is vital to ensure their explanations and any arranged session are given at the appropriate level for first year undergraduates. This usually means it is best to work with individuals and projects with which you are familiar or directly involved with yourself.

In terms of visiting research institutions the process can be a little hit and miss in the first place as sometimes the research contact may deliver inappropriate material at the wrong level. As tutor the decision is then whether to drop the visit or to try improve the visit in discussion with the collaborator.

Does it work?

Generally this module works very well. End of module evaluations suggest the students appreciate the exposure to on-going research in the School and enjoy visiting relevant research Institutions. They often comment how the research they see links with some of the more theoretical teaching they get in other modules. There are several other benefits worth highlighting:

1. Students get exposure to a variety of career possibilities which may be open to them on graduation
2. Students often base their final year research project on some aspect of the research they have seen being undertaken within the School or the Research Institutions. In fact it is common for a third year student to carry out their research in association with one of the institutes they visit
3. The tutor can also gain from regular contact with the wide range of researchers within the School and the associated Institutes. I would regard this as a very useful way of keeping in touch with the variety of research that is going on within the locality

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What problems/issues have arisen?

The module is quite time-consuming in terms of arrangements and can occur additional expense if regular coach travel is required. It is important to have several back-up sessions as some research visits have to be cancelled at the last minute. The biggest problems are associated with new sessions when either the researcher, or the Institution being visited are relatively unknown. However, having run the module for a number of years a large portfolio of potential activities has been accumulated.

Details of support material/course work/assessment methods *(perhaps attach as a separate file any details that you think would help others; e.g. the detailed instructions you give students)*

Assessment: is usually via a fieldwork diary. This is supposed to be more than just a report of what they have seen and should include evidence of extra reading (references) and reflection on the research they have been exposed to. Experiments and monitoring they undertake themselves as part of the module is written up in a more formal scientific manner within the diaries. Usually one of the sessions is linked to an oral presentation which will take place during the final week of term.

Relevant references

See websites quoted above
