


# AG-02: ENGAGE, the Interactive Research Resource for Bioscience Students


This project aimed to develop a website that can help students to develop their research skills throughout their degree programme. Two existing websites, Guidance for Student Projects ([www.gsp.rdg.ac.uk](http://www.gsp.rdg.ac.uk), funded by the Higher Education Academy Centre for Bioscience) and Scientific Training by Assignment for Research Students ([www.stars.rdg.ac.uk](http://www.stars.rdg.ac.uk)) funded by University College Cork, Eire, were subjected to student focus groups and questionnaires to inform how best to update the websites. A clear student preference for a single website emerged. This project will amalgamate and re-develop the websites into *BioScience Skills Online*. The new website will aim to support students in the completion of high quality work relating to scientific investigation in the Biosciences and provide support for undergraduates throughout their degree programme by covering the basic principles of science through to publishing scientific research.


As the website is still to be launched (due July 07) it is too early to evaluate the impact of this new resource on undergraduate learning.


# **ENGAGE**


***The interactive research resource for bioscience students***


  
**Getting Started in Science**


  
**Reviewing Literature**


  
**Planning Your Research**

  
**Step-by-Step Statistics**

  
**Writing Scientifically**

  
**Presenting Science**

  
**Going Professional**

  
**How Do I ... ?**

<<<< Quick Links >>>>

ENTERSITE

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**Project Code:** AG-02      **Discipline:** School of Agriculture, Policy and Development      **Project Title:** BioScience Skills Online

**Description:** This project aims to develop a website which can help students to develop their research skills throughout their degree programme. Two existing websites, Guidance for Student Projects ([www.gsp.rdg.ac.uk](http://www.gsp.rdg.ac.uk)) and Scientific Training by Assignment for Research Students ([www.stars.rdg.ac.uk](http://www.stars.rdg.ac.uk)), were subjected to student focus groups and questionnaires to inform how best to update the websites. A clear student preference for a single website emerged. This project will amalgamate and re-develop the websites into *BioScience Skills Online*. The new website will aim to support students in the completion of high quality work relating to scientific investigation in the Biosciences and provide support for undergraduates throughout their degree programme by covering the basic principles of science through to publishing scientific research.

<p><b>A</b></p> <p><b>What is the perceived problem or challenge?</b></p>	<p><b>B</b></p> <p><b>Enabling Factors</b></p> <p>What resources will facilitate the project?</p>	<p><b>C</b></p> <p><b>Processes</b></p> <p>How is this project going to be achieved?</p>	<p><b>D</b></p> <p><b>Objectives</b></p> <p>What is the end product or result of the project?</p>	<p><b>E</b></p> <p><b>Evaluation Data</b></p> <p>What methods can be used to demonstrate the success or impact of this project?</p>	<p><b>F</b></p> <p><b>Unintended consequences</b></p> <p>What have been the unintended consequences of enacting this project?</p>
<p><b>The staff perspective Problem:</b> Staff often assume that bioscience students have a basic understanding of the scientific process and that they are knowledgeable about certain key aspects of research, e.g. literature reviews, data interpretation etc, or that they have been taught this in previous modules. These assumptions may be mistaken.</p> <p>There is a lack of lack of free online resources to facilitate the teaching of the scientific process.</p> <p><b>The student perspective Problem:</b> Bioscience students often enter University with little experience of research. The way they learn in secondary school is often vastly different to what takes place at University level.</p>	<p>A CETL-AURS <b>Teaching Associate</b> will lead on content development including written content, podcasting and interactive exercises, as well as maintaining the finalised resource.</p> <p>The Teaching Associate will be supported by the CETL-AURS Director and Agriculture Research Fellow.</p> <p>A <b>further part-time staff member</b> will be employed to populate the website and locate valuable resources.</p> <p>A <b>web designer</b> will be employed to ensure professional polish in the appearance of the website.</p> <p><b>Staff and students</b> will be approached individually to provide help with podcasts and video clips. Existing websites <a href="http://www.gsp.rdg.ac.uk">www.gsp.rdg.ac.uk</a> and <a href="http://www.stars.rdg.ac.uk">www.stars.rdg.ac.uk</a> will provide materials and worked examples.</p>	<p>A student review of two existing online resources will be undertaken.</p> <p>A development plan for an improved, combined resource will be made.</p> <p>The skeleton of the new website is decided, and information/resources from GSP and STARS will be used to populate <i>BioScience Skills Online</i> where appropriate. New material will be created from scratch by the Teaching Associate and a part-time colleague.</p>	<p><b>Student Perspective:</b> Bioscience undergraduates' knowledge of research and scientific processes will have been enhanced through use of the websites.</p> <p><b>Staff Perspective:</b> Effective teaching about the scientific process is increased through free staff access to downloadable materials in the form of written and interactive examples, podcasts and video clips.</p> <p><b>National Agenda</b> This CETL-funded resource will be made available to other HEIs.</p>	<p><b>Curriculum integration</b> The integration of the website into curricula will ensure the website is accessed and used by undergraduate students.</p> <p><b>Access statistics</b> Access statistics can be used to compare the 'hit' rate of BSS Online with GSP and STARS.</p> <p><b>Log dissemination</b> Conference papers and published papers referring to the site.</p> <p>Students using the website will be asked to evaluate the impacts on their learning.</p> <p>Do supervising staff feel that UG dissertation design is improving?</p>	<p>Staff have gained experience in new e learning techniques such as podcasting and video linking.</p>

# AG02: ENGAGE, the Interactive Research Resource for Bioscience Students

## 1. Project Progress and Timeline

### 1.1 Timeline

Done	Project stage post	planned end date	actual end date
	Start January 2006		
<input checked="" type="checkbox"/>	Confirm the content (sections) for the website	Jan 06	Jan 06
<input checked="" type="checkbox"/>	Initial template for the website	Mar 06	Apr 06
<input checked="" type="checkbox"/>	Employ developer	Jun 06	Jun 06
<input type="checkbox"/>	Develop content	Nov 06	
<input type="checkbox"/>	Employ web designer to build website	Jun 07	
<input type="checkbox"/>	Present the website at the Science T&L Conference	Jul 07	
<input type="checkbox"/>	Present the website at the University T&L Day	Jul 07	
<input type="checkbox"/>	Marketing campaign	Jul 07	

### 1.2 Enabling Factors: State the resources used in this L&T-enhancement project

The creation of the ENGAGE website has been managed by the *Teaching Associate (TA)* and supported by the Agriculture Research Fellow and the CETL-AURS Innovation Manager. The Teaching Associate has been the primary contact, developing written content, Podcasts, worked examples and interactive exercises. The TA will also be responsible for maintaining the final website (checking links are active etc.). Time allocated to ENGAGE to date: approximately 3 months at 20%, 6 months 40%, 6 months 60%.

A further part-time member of staff was employed for 6 months, 0.4FTE, to create a template website, help populate the website and locate valuable resources.

Black Book Services Ltd., a company who specialise in web design, were employed to further develop the layout and design of the finalised website and to add the existing content. They have currently spent 310 hours on the website and are due to complete it by June 2007.

Staff and students were approached individually to provide worked examples, interactive exercises and Podcasts. Podcasts take on average 30 minutes to prepare and complete, with approximately 12 hours of staff time contributed to date.

Two existing websites, (*Guidance for Student Projects* [www.gsp.rdg.ac.uk](http://www.gsp.rdg.ac.uk) and *Scientific Training by Assignment for Research Students* [www.stars.rdg.ac.uk](http://www.stars.rdg.ac.uk)) which were partly authored by project members Julian Park and Anne Crook, provided materials and worked examples.

### 1.3 Processes: What were the key challenges in delivering this project?

There were a number of challenges encountered during this project, including: **deciding to create a new website rather than upgrading an existing one.** Originally the existing websites GSP (*Guidance for Student Projects*, funded by the Higher Education Academy) and STARS (*Scientific Training by Assignment for Research Students*, funded by University College Cork, Eire) were to be upgraded. On discussion with students who reviewed the existing two resources, it was decided to create a single website. It was also

decided to expand the scope of the website to include all aspects of research that undergraduate students may be involved in, from the day they start University to the day they leave. This changed the focus of the website considerably.

**the scale of the new website.** Although the Agriculture Fellow and CETL-AURS Innovation Manager had been involved with creating and developing the GSP and STARS websites, these were considerably smaller, less detailed and less interactive than the new website. All those involved invariably underestimated the time, effort and resources required to develop and populate the website.

**checking and editing the content.** Editing was carried out in two stages. The initial content was written by the TA, passed to the TF to comment on and add to, then passed to the CETL-AURS Manager to further comment on and add to. The edited pages were passed back to the TA to implement the changes. This process was time-consuming, although the robustness of the editorial process has been a strength of the project. ENGAGE consists of approximately 300 web pages, each with extensive external links, photographs, podcasts, worked examples and exercises. Both the writing of the content and the review process has been very time consuming, involving three members of staff.

**developing the website content:**

**podcasts.** Podcasts were recorded by students and staff, and then edited into a useable format, requiring self-training in specialist software. Podcasts were supplied through the goodwill of colleagues and staff (Appendix 1).

**exercises.** Exercises (Appendix 2) were created to allow students to 'have a go'. Answers are also provided.

**worked examples.** Worked examples were created from scratch, requiring background reading around topics to ensure the examples were credible.

**finding links to external websites.** These needed to add value to particular topics/sections. The websites also had to be credible (from a reliable source) and non-conflicting (not repeating the information in ENGAGE).

**populating with visual images.** Picture research proved lengthy, finding images that were relevant to the particular topic/section, colourful and genuinely interesting (Appendix 3). In addition, checks had to be made to ensure the images were copy-right free or cleared and of high quality.

**agreeing on the design for the website.** It was essential to create a clean, professional look that would encourage students to delve deeper into the website. Professional advice from web-designers was taken at several stages.

**marketing** will be achieved in a number of ways, including presentations at conferences, dissemination via the HEA, Centre for Bioscience and discussion with colleagues at other institutes. In addition, advertising material e.g. fliers, mugs etc will be produced.

## 2. Outputs and Evaluation

### 2.1 List the evaluation evidence/data collected

Date	Quantitative or qualitative	Evaluation by	Description / Method
Oct 05	Qualitative	Students	Evaluation of existing websites
Dec 05	Quantitative	ITS	Hit numbers for existing GSP/STARS websites

Feb 07	Qualitative	Academic Staff	Feedback on proposed template for ENGAGE
Apr 07	Qualitative	Students	Feedback on ENGAGE
Apr 07	Qualitative	Academic Staff	Feedback on ENGAGE

## 2.2 Summarise the key results from your data

The qualitative feedback by students completed in Oct 05 of the existing GSP/STARS websites resulted in refocusing the direction of the project. The initial comments from students are valid – why visit two websites when one will do. The revised target date for completion of the website is now July 2007. After this time, the access statistics for GSP and STARS can be compared to that of ENGAGE. Students and staff will also be asked to evaluate the website before it ‘goes live’.

## 2.3 How would you, as the PI, summarise the success of this project?

This has turned out to be a much larger project than first envisaged and therefore the initial completion date of November 2006 has been revised accordingly. After a comprehensive search on the internet, it became clear there is a lack of credible information for students who want to undertake research, or need more advice on what research is and how to get started with their own research. However, the ENGAGE website does more than provide information. Through Podcasts, academics and students can give their point of view and advice on mistakes they’ve made and how not to make them again. Worked examples illustrate good practice and common mistakes. Exercises allow students the opportunity to practise some of the techniques outlined on the website. In addition, as well as providing basic information, students are encouraged to take control of their education and to be pro-active in relation to managing their own time). They are also encouraged to think about presenting their data at conferences and in peer-reviewed journals.

The website is being presented at the Science Teaching and Learning Conference 2007 and at the University Teaching and Learning Conference in July 2007 to increase awareness. Our intention is to launch a significant advertising campaign on completion of the website to market the site to students and academics throughout the UK and abroad. This will be done through HEA Bioscience and appropriate media advertising. Our target is to secure 10,000 hits in the first year of use.

## 3. Impact and Consequences

### 3.1 How many students (and at what level and in which programme areas) has this L&T enhancement project impacted on?

At this initial stage in the project, the potential impact of the website is difficult to gauge. Given the scope and access to the internet, a very large number of students have the potential to gain benefit from the website, both within the University and in the broader Higher Education sector. Within the School there are approximately 110 Undergraduates per year across all the degree programmes who will be encouraged to use the website as a credible reference tool from the next academic year. There has also been a great deal of interest from *module convenors* and *programme directors*, in terms of the teaching material that can be downloaded. Within the University, there are several Schools and

Departments that can equally benefit, particularly in relation to the statistics section, including Zoology, Horticulture and Bioscience.

### **3.2 Has this project positively contributed to the teaching environment and satisfaction of the academic staff delivering this provision?**

It will be easier to judge this once the site goes live. However, ENGAGE provides Podcasts, worked examples and exercises that are all available for download and to use in a teaching environment. It is anticipated that Staff within the School will benefit from the teaching resources that the website provides which may reduce the time spent on developing teaching materials, thereby allowing staff to concentrate on other aspects of their teaching and research.

### **3.3 Summarise the unforeseen consequences of this project**

The website has provided a chance to network with staff from other institutes and CETL's, including Andy Hagyard from the Learn Higher CETL (consortium of 16 Universities). The HEA Centre for Biosciences has been consulted on the design of the website. Finally, the *Teaching Associate* has gained new IT skills, including website design, software utilisation and Podcasting.

## **4. Dissemination**

### **4.1 Log dissemination activities relating to this L&T Project**

Date	Main Audience	Type	Dissemination activity
Jun-07	UK Academics	Information	Poster Presentation <i>Science Learning and Teaching Conference</i> (HEA hosted, at Keele)
Jun-07	UK Academics	Information	Paper: <i>Science Learning and Teaching Conference</i> (HEA hosted, at Keele)
Jul-07	UoR Academics	Information	Advertising of the ENGAGE website and its use in T&L in <i>Teaching Matters</i>
Jul-07	UoR Academics	Information	Paper: <i>University of Reading Teaching and Learning Conference</i>
Jul-07	UK Academics	Information	Nationwide marketing campaign for ENGAGE
Jul-07	UK Undergraduates	Information	Nationwide marketing campaign for ENGAGE
Aug-07	UoR Undergraduates	Information	Marketing to current students

### **4.2 Beyond this evaluation, do you see any scope for pedagogic research in this area of learning?**

There is potential scope for pedagogic research in terms of the use of e-sources in the learning process.

#### **Project Developer's names:**

Dr. Gillian Fraser, Dr. Julian Park, Dr. Anne Crook, Melissa Ercolin, Black Book Services Ltd.

## Appendix 1. An example of Podcast topics.

### Find out about the research that's going on in your department

Within your department there will be lecturers, researchers, technicians and postgraduate students, all of whom are likely to be actively involved in various forms of research. Why not find out more about the research they do - often you will find posters around your department which explain research areas, or you could look on your Department's web site for more information. If you're interested in something that's on-going you could then go and talk with the staff involved and they may be able to give you some advice.

#### Podcast

A final year student, discusses how he chose his research question based on work that was on-going in his department



### What motivates you?

Think about what interests you and how you prefer to work. You might, for example, really enjoy working out in the field and therefore prefer not to work in a laboratory environment. Similarly you may relish the opportunity to work in a laboratory and may not be too keen on fieldwork. Knowing how and where you prefer to work can inform your choice of research topic.

#### Podcast

Emma Surman, final year student discusses how she chose her final year research question based on her interests on her home farm



### Do you have a career preference?

You might already know the type of career you'd like to pursue once you've graduated, or what company/type of company you'd like to work for. For example, if you'd like to work for a pharmaceutical company, it may be beneficial to undertake research in this area if the opportunity arises. Be aware that it may not always be possible to tailor your research question to your career choice, but undertaking a project that will develop the kinds of skills required could be a useful compromise. Your research may put you in contact with potential employers and therefore be a stepping stone to your ideal job.

#### Podcast

Dr Glynn Percival, R A Bartlett Tree Research Laboratory, discussing the importance of gaining research experience



## Appendix 2. An example of an Exercise.

Introduction > Getting Started in Science > Hypotheses > From Research Question to Null Hypothesis

### From Research Question to Null Hypothesis

Here's a chance for you to have a go at developing some null hypotheses. Using the examples below, develop null hypotheses based on the research questions provided.

An experiment has been designed to investigate the effects of proposed climate change, in particular warmer spring temperatures, on the growth and development of lambs.

Answer



High levels of iron sulfate are thought to have a detrimental effects upon the population dynamics of water fleas (*Daphnia magna*). An experiment was designed to investigate the effects of high phosphorous concentration on female Daphnia egg production.

Answer



Dung beetle colonisation and activity is thought to be influenced by not only the quality of the dung, but also the size of the dung pat. An experiment was designed to investigate the relationship between beetle colonisation and the dung pat.

Answer





## Appendix 3. An example of the photographs used.

# ENGAGE


The interactive research resource for bioscience students

Getting Started | Reviewing Literature | Planning Research | Data Collection | Data Analysis | Presentation | Publishing | How


Introduction > Getting Started in Science > Choosing Your Research Topic

## Choosing Your Research Topic


Most research starts by thinking about a topic you're interested in. To maximise your options within your chosen subject area, try to keep topic as general as possible. Examples of research topics are:



Coral reefs



Cloning



Biodiversity

In many instances, you may not be given much of a choice about your research topic, particularly if you're preparing coursework (essays, posters, oral presentations, etc) or if you're conducting an experiment as part of your studies.

Depending on your university/department, you may be expected to come up with your own research topic for your final year research project (sometimes called a dissertation). Some students may have a specific interest and a clear idea of what they're going to research for their final year project. Don't panic if you haven't got a clue what area you want to concentrate your research on though! Your department/supervisor will have copies of [past dissertations](#) and looking through a good thesis will not only give you an idea about the types of research you can get involved with, but also help you see what's expected of you.

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