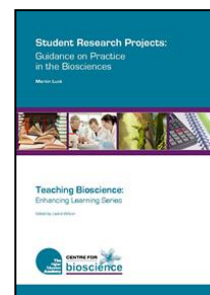


Resource List for Final Year Projects: Maximising the Learning

The UK Centre for Bioscience has compiled a select list of resources which is designed to complement the *Final Year Project* event and our 3rd Learning Guide written by Martin Luck, *Student Research Projects: Guidance on Practice in the Biosciences*. By no means is it intended to be a comprehensive list but rather a selection of resources and useful pointers to the literature in this area. For additional information, please refer to the related section on our website: www.bioscience.heacademy.ac.uk/resources/guides/studentres.aspx

Centre Publications and Support

We would highly recommend you consult the learning guide on **Student Research Projects** by **Martin Luck**, and references therein. This Guide is the third in the Teaching Bioscience Enhancing Learning Series published by the Centre for Bioscience. In the first three chapters Martin explores the value of student research in the biosciences, ways of implementing research projects for final year students, and project outcomes and assessment. The second section of the book features ten bioscience case studies which cover a range of formats of research project: conventional laboratory or field studies, group projects and a diversity of alternative forms involving data-mining and analysis, and commercial, communication and education-based investigations.



Further case studies to accompany the guide can be found at:

www.bioscience.heacademy.ac.uk/resources/guides/studentrescs.aspx

You may also find the following resources on linking teaching and research relevant:

www.bioscience.heacademy.ac.uk/resources/ltr/linkteachresearchcasestudies.aspx

Centre Funded Project Reports

Yeoman, K. (2010) The development of a science communication course for undergraduates. www.bioscience.heacademy.ac.uk/resources/projects/yeoman.aspx

Sparagano, O. (2002) Case study of a student conference on animal nutrition. www.bioscience.heacademy.ac.uk/resources/projects/sparagano.aspx

Bioscience Bulletin Articles

Lloyd, D. (2006) Final-year projects in science communication. Bioscience Bulletin 18, p11 available at www.bioscience.heacademy.ac.uk/ftp/newsletters/bulletin18p11.pdf

Smith, J. and Hawkins, J. (2008) Creating a bank of plant-based research projects for final year students. Bioscience Bulletin 24, p3 available at www.bioscience.heacademy.ac.uk/ftp/newsletters/bulletin24p3.pdf

Schubert, F.R. (2009) Capstone experiences to support school research events. Bioscience Bulletin 27, p4 available at www.bioscience.heacademy.ac.uk/ftp/newsletters/bulletin27p4.pdf

Peer-reviewed articles

Badge, J.L. and Badge, R.M. (2009) Online lab books for supervision of project students, *Bioscience Education*, 14-c1 available at www.bioscience.heacademy.ac.uk/journal/vol14/beej-14-c1.aspx

Finn, J.A. and Crook, A.C. (2003) Research skills training for undergraduate researchers: the pedagogical approach of the STARS project, *Bioscience Education E-journal*, **2**-1 available at www.bioscience.heacademy.ac.uk/journal/vol2/beej-2-1.aspx

Fraser, G.A., Crook, A.C. and Park J.R. (2007) A Tool for Mapping Research Skills in Undergraduate Curricula, *Bioscience Education E-journal*, **9**-1 available at www.bioscience.heacademy.ac.uk/journal/vol9/beej-9-1.aspx

Harland, J., Pitt, S. and Saunders, V. (2005) Factors Affecting Student Choice of the Undergraduate Research Project: Staff and Student Perceptions, *Bioscience Education E-journal*, **5**-3 available at www.bioscience.heacademy.ac.uk/journal/vol5/beej-5-3.aspx

Hollingsworth, M., Mahon, M. and Thomas, L. (2004) Web projects for Life Science students, *Bioscience Education E-journal*, **4**-5 available at www.bioscience.heacademy.ac.uk/journal/vol4/beej-4-5.aspx

Langan, M., Cullen, R. and Shuker, D. (2008) Student Learning Networks on Residential Field Courses: Does Size Matter? *Bioscience Education E-journal*, **11**-1 available at www.bioscience.heacademy.ac.uk/journal/vol11/beej-11-1.aspx

MacKenzie, J. and Ruxton, G. (2006) Supporting the Development of Undergraduates' Experimental Design Skills and Investigating their Perceptions of Project Work, *Bioscience Education E-journal*, **8**-2 available at www.bioscience.heacademy.ac.uk/journal/vol8/beej-8-2.aspx

Panizzon, D. and Boulton, A.J. (2004) Strategies for enhancing the learning of ecological research methods and statistics by tertiary environmental science students, *Bioscience Education E-journal*, **4**-1 available at www.bioscience.heacademy.ac.uk/journal/vol4/beej-4-1.aspx

Ryder, J. (2004) What can students learn from final year research projects? *Bioscience Education E-journal*, **4**-2 available at www.bioscience.heacademy.ac.uk/journal/vol4/beej-4-2.aspx

Sutcliffe, I.C. and Cummings, S.P. (2007) Making bioinformatics projects a meaningful experience in an undergraduate biotechnology or biomedical science programme, *Bioscience Education E-journal*, **10**-2 available at www.bioscience.heacademy.ac.uk/journal/vol10/beej-10-2.aspx

Yeoman, K.H. and Zamorski, B. (2008) Investigating the Impact on Skill Development of an Undergraduate Scientific Research Skills Course, *Bioscience Education E-journal*, **11**-5 available at www.bioscience.heacademy.ac.uk/journal/vol11/beej-11-5.aspx

Event reports

Reports from events about final year projects held in previous years at Durham, Cardiff and Manchester Universities:

www.bioscience.heacademy.ac.uk/events/dur05.aspx

www.bioscience.heacademy.ac.uk/events/finalcar.aspx

www.bioscience.heacademy.ac.uk/events/finalman.aspx

Reports from previous events on the theme of linking research and teaching may also be of interest:

www.bioscience.heacademy.ac.uk/events/gcal280208.aspx

www.bioscience.heacademy.ac.uk/events/napier07.aspx

www.bioscience.heacademy.ac.uk/events/york05.aspx

Other useful Centre publications

The Assessment Briefing brings together references and resources in specific areas of on assessment in the biosciences. This has sections specific to assessment of practical and field work as well as group work and problem based learning.

www.bioscience.heacademy.ac.uk/ftp/resources/briefing/assessment.aspx

Developing Problem Solving Skills in Bioscientists This report contains case studies with practical examples of introducing problem solving skills and tips on how to assess these skills. Of particular note is a case study by John Shuttleworth (University of Birmingham) which provides details of critical literature review and experimental design.

www.bioscience.heacademy.ac.uk/resources/problemsolving/

Useful External Publications and Project Outputs

Tatalovic, M. (2008) Student science publishing: an exploratory study of undergraduate science research journals and popular science magazines in the US and Europe. *Journal of Science Communication* 7, 3. <http://jcom.sissa.it/archive/07/03>

ENGAGE in research: The interactive resource and guide to scientific research for bioscience students www.engageinresearch.ac.uk

Surveys and Views on Student Research

Cowie, R.J. (2005) A snapshot of final year project provision in UK bioscience departments. Available at www.bioscience.heacademy.ac.uk/ftp/SIG/projectsurvey.pdf

Cowie, R.J. (2005) Project skills survey. Available at www.bioscience.heacademy.ac.uk/ftp/events/york05/projectskills.pdf

Student Research Publications in the Biosciences

Bioscience Horizons (UK and Ireland)

"Bioscience Horizons is a free online journal publishing the best undergraduate bioscience research from the UK and Republic of Ireland. The journal provides a forum for students, their supervisors and universities, to showcase high quality undergraduate research work, strengthening the link between teaching and research in higher education. All papers are written by students and based on final year research projects."

<http://biohorizons.oxfordjournals.org/>



Biolog-e (University of Leeds)

"Biolog-e was the first undergraduate journal to be established at the University of Leeds. The journal publishes representative examples of first class undergraduate bioscience research projects and student articles."

www.fbs.leeds.ac.uk/students/ejournal/Biolog-e/index.php

BURN (University of Nottingham)

"BURN is the showcase for undergraduates at Sutton Bonington presenting articles and scientific reports of student research from across the Bioscience divisions."

www.nottingham.ac.uk/burn/

Reinvention Journal (University of Warwick)

An online, peer-reviewed journal, dedicated to the publication of high-quality undergraduate student research. The journal welcomes academic articles from all disciplinary areas.

www2.warwick.ac.uk/fac/soc/sociology/rsw/undergrad/cetl/ejournal/about/

CETLs

CETL-AURS, Centre for Applied Undergraduate Research Skills

"The aim of CETL-AURS is to put scholarship and enquiry at the centre of the learning environment by integrating research-based learning into the undergraduate curriculum."

www.reading.ac.uk/cetl-aurs

Reinvention Centre for Undergraduate Research

"The main aim of the Reinvention Centre is to integrate research-based learning into the undergraduate curriculum. The purpose is not simply to teach undergraduates research skills but to enable undergraduates to become involved in research and integrated into the research cultures of their departments." www.warwick.ac.uk/go/reinvention

Research-led Teaching

Developing undergraduate research and inquiry by Alan Jenkins and Mick Healey (June 2009). This latest publication is based on the premise that all undergraduate students in all higher education institutions should experience learning through, and about, research and inquiry. There should be a move away from students as audience to individual academics' research towards students becoming stakeholders in a research community in which their experience of research mirrors that of their lecturers. <http://tiny.cc/3dcui>

The UK Centre for Bioscience also has further information on this issue at

www.bioscience.heacademy.ac.uk/resources/ltr/

The Research Informed Teaching Initiative at the University of Staffordshire provides another useful website with details including curriculum design and the research-teaching nexus with further links to other resources and institutes.

www.staffs.ac.uk/research/research_informed_teaching/