



CENTRE FOR

bioscience



Open Educational Resources in the Biosciences

Developing an Interactive Laboratory and Fieldwork Manual

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

biooer.jiscinvolve.org/

Supporting teaching in higher education to improve student learning across the Biosciences



Outline

- Open Educational Resources
 - What and why
- The OER programme
 - How it is being executed and what it means to the discipline community
- Issues and outcomes
 - Critical success factors for the *pilot*



What is OER?

- Educational resources designed for sharing *and* further development
 - IPR-cleared (Creative Commons SA licensed)
 - Easy to find (fully described and uploaded)
 - Easy to use (context and guidance available)
 - Quality assured (proven in teaching)
 - Re-purposable, and shared back again if possible
- Key established organisations:
 - OCW Consortium (MIT), Creative Commons, OpenLearn (OU)



Why OER?

- Overcoming issues of academic ownership
 - Creating *legally* free resources
 - Need to move away from culture of casual reuse of copyrighted resources
- Stop re-inventing the wheel at every institution
- Time savings – build on and enhance others' OERs
- Influencing institutional policy
- Individual and institutional recognition, nationally and internationally
- Skills development
- “Sunlight effect” – enhanced quality
 - Cecilia d'Oliveira, executive director OpenCourseWare



The OER programme

- Initiated by HEFCE/JISC and delivered by JISC/Academy
- Pilot project for further programmes (2010-)
 - Pilot phase £5.7m (April 2009-April 2010)
 - <£3m for 12 Subject Centres to run projects
- **Not buying rights to old resources!**
 - But opening up existing, valued content demonstrating various approaches
- Cultural change and sustainable processes
 - Content is an indicator of processes in place – a metric
 - Sustained release – institutional IPR policies updated
 - Benefits for academic profile, institutional profile, discipline profile **and their students**



Funded projects

- **Institutional, Subject and Individual strands**

- Coventry - Open Content Employability
- Exeter - Open Exeter
- Leeds Met - Unicycle
- Leicester University - OTTER
- Nottingham University - BERLiN
- Oxford University - Open Spires
- Staffordshire University - OpenStaffs

- York, Westminster, Oxford Brookes, Falmouth, Anglia Ruskin, UCL, UCLAN, Lincoln and Bradford



Funded projects

Subject strand

- SC LLAS (Southampton), ENG (Royal Holloway), PRS (Leeds), HCA (Durham) The HumBox Project
- SC ICS (Ulster) Open Educational Repository in Support of Computer Science
- SC Engineering (Loughborough) Open Educational Resources Pilot
- SC UKCME (Liverpool) CORE-Materials: Collaborative Open Resource Environment – for Materials
- SC Economics (Bristol) TRUE: Teaching Resources for Undergraduate Economics
- SC Physical Sciences (Hull/Liverpool) Skills for Scientists
- SC GEES (Plymouth) C-change in GEES: Open licensing of climate change and sustainability resources in the Geography, Earth and Environmental Sciences
- SC ADM (Brighton) Open Educational Resources in Art, Design and Media
- SC MSOR (Nottingham Trent) FETLAR (Finding electronic teaching learning and assessment resources)
- **SC Bioscience (Leeds) ‘An Interactive Laboratory and Fieldwork Manual for the Biosciences’**
 - SC UKCLE (Warwick) Simulation Learning Resources
 - SC HSAP (KCL) Public Health Open Resources in the University Sector (PHORUS)
 - SC C-SAP (Southampton) Evaluating the practice of collective endeavour in opening up key resources for learning and teaching in the social sciences
 - SC MEDEV (Newcastle) Organising Open Educational Resources (OOER)



Our work

- Ten project ‘consortia’ with Bioscience
 - Nottingham: Biodiversity components
 - Oxford: iCases – Influenza outbreak
 - DeMontfort: Virtual Analytical Laboratory
 - OU: Biochemistry virtual laboratories
 - Bath: Cancer Biology
 - UCL: Virtual museum zoology
 - Glasgow: Virtual Ecology
 - Gloucestershire: Java based Rocky Shore simulation
 - Leeds: Medical Microbiology resources
 - Manchester: Genetic Analysis scenarios



Our work

- Contributing existing resources which need reworking for open release
- Output into JorumOpen where possible (exc. Service-based res.)
- Resolving IPR using creative commons UK licences (e.g. BY-NC-SA)
- Sharing good practice through network for others to benefit



Nottingham: Biodiversity components (eXe - html)

- An aerial survey of mammals in Kruger National Park (fieldwork regarded as 'exotic' and 'expensive')
- Surveys of a set of gravestones in North Yorkshire (and therefore an example of sampling sessile populations, alongside more general information on lichens)
- A more theoretical unit that examines biodiversity indices and models.



Oxford: iCases – Influenza outbreak (Quandary)

- opportunity to interact with experimental data in a realistic context, with limited time and money, to resolve a complex situation typical in biomedical sciences.



DeMontfort: Virtual Analytical Laboratory (Flash/FLV)

- An on-line resource designed to help bioscience students to build their confidence in the laboratory and gain essential laboratory skills, from pipetting, microscopy and basic microbiological techniques.
- Designed for mobile learning



OU: Biochemistry Virtual Laboratories (C++)

- Three virtual laboratories developed as components of a level-3 course Molecular and Cell Biology (S377).
- Each laboratory is supplemented with background reading material from the parent course, to provide a complete self-contained teaching package.



University of Bath: Cancer Biology (Flash, PPT)

- An interactive online e-learning tutorial on cancer biology, designed to help conceptualise complex cellular processes in DNA replication, damage and repair.
- Supported by formative quizzes, references and printer-ready notes



UCL: Virtual museum of zoology (eXe - html)

- A series of web books and associated quizzes outlining the diversity of the animal kingdom from an evolutionary perspective
- Includes an extensive image collection



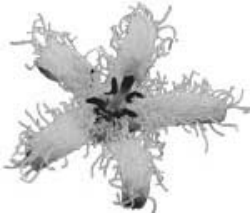
Glasgow: Virtual Ecology (PPT, mp4)

- A collection of resources designed to supplement lecture and field courses in ecology by providing a level of detail that goes beyond what can be presented in a lecture or learnt at a single field site in the short space of time available on a field course.



Gloucestershire: Virtual Rocky Shore (Java, html)

- Addresses the design of manipulative experiments
- Simulation of grazing snails on a rocky shore, allowing an open, enquiry-based approach to experimental design.
- The simulation allows data to be rapidly collected and analysed in a short space of time.



Leeds: Medical Microbiology resources (PPT, Articulate, QTIXML)

- Set of resources designed to support mainly first-year modules, and comprises the teaching of core knowledge with respect to microbiology.
- They consist primarily of Articulate presentations and Articulate Engage interactions demonstrating both theoretical and practical aspects of common Undergraduate modules.



Manchester: Genetic Analysis scenarios (SBLi)

- A set of scenarios designed to support an undergraduate course in Genetics.
- In the scenarios the student plays the role of a genetics researcher, and performs simulated experiments to reinforce concepts taught in lectures.



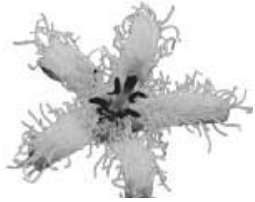
JorumOpen

- <http://open.jorum.ac.uk/>
- JISC-funded/supported repository
- Free for ALL to access, search and download from
- Free for UK HE to upload to (log in via federated access management)
- Records exposed to Google

[Possibly demo]

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Essentials of Medical Microbiology III - Part 2 of 2	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-01-28)
Essentials of Medical Microbiology III - Part 1 of 2	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-01-28)
Essentials of Medical Microbiology II - Part 3 of 4	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-03-05)
Essentials of Medical Microbiology I - Part 1 of 2	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-03-05)
Cure the deer or die - a microbiological dilemma!	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-02-11)
Essentials of Medical Microbiology II - Part 1 of 4	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-01-27)
Human microbiota in disease	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-01-27)
Essentials of Medical Microbiology I - Part 2 of 2	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-03-05)
Essentials of Medical Microbiology II - Part 2 of 4	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-03-05)
Essentials of Medical Microbiology II - Part 4 of 4	Dr John Heritage and Dr Sue Bickerdike, University of Leeds (2010-03-05)

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Benefits for you

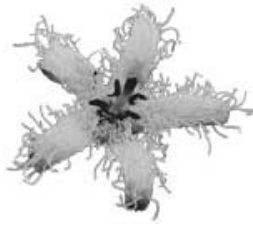
Easy access via our website to 200+ high quality learning and teaching resources that are:

- Specifically aimed at supporting laboratory and fieldwork
- IPR-cleared
- Accessible
- Designed and built to be as open as possible
- Accompanied with guidance on how to use, re-use and re-purpose for your own requirements
- Sustainable (min 5 yr)

Direct continued support from service-based OERs (SBLi, iCases).

Indirect support and advice through information produced as part of this pilot project in the form of a wiki, written to offer guidance on the steps required to create and publish your own OER.

Avoid needless duplication across the discipline.



Open Educational Resources Project (Subject strand) - Mozilla Firefox

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http://www.bioscience.heacademy.ac.uk/resources/oer/

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• V.E.R.B. - Evolutionary History
• Virtual Rocky Shore

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The UK Centre for Bioscience is taking part in a pilot programme for the release of Open Educational Resources (OER) following a successful bid for £250,000 from HEFCE/JISC as part of the subject strand. This is part of a wider programme on £5.7m to encourage and enable the open sharing of educational resources.

What are we seeking to achieve?

By working in partnership with the Academy, professional bodies and institutions we will identify the issues and problems for developing OER in the Biosciences. We have selected a broad sample of learning and teaching materials which we believe are representative of the types of resource available to support practical work in many Bioscience disciplines, which also illustrate a range of approaches. These will become 'An Interactive Laboratory and Fieldwork Manual for the Biosciences' and made available through links on our project site and numerous services including the forthcoming JorumOpen. Although these are targeted towards level 1 practical classes we expect components to be useful for various levels.

The Centre will use its networks and contacts to promote the use of OER and explore the issues of the potential adopters to inform the post-pilot programme.

What are Open Educational Resources?

Open Educational Resources are resources for learning and teaching which are specifically designed with a different and distinct purpose; to *encourage* re-use, re-mixing and re-purposing.

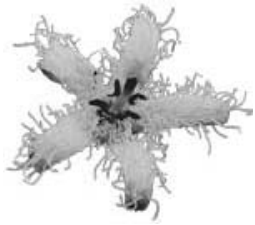
It has long been recognised that it is good to share learning and teaching materials. Not only does this save time and effort but it enables these resources to be appreciated by a wider audience. This inevitably leads to suggestions for development and the quality of the resource can be improved. However, this does not occur in most cases; the popular practice of sharing existing institutional resources in HE is limited by a number of factors typified by the following questions.

- **Has it been tailored for my course?** Many modules will have content similar to others outside the institution but the context of the delivery is different so the resource does not appear integrated to other learning materials.
- **Can I trust the quality of the content?** Many resources have not been properly documented - they can be provided for sharing with little history leading to less confidence in their use.
- **Has it been kept up-to-date?** Typically resources are passed around (once permission has been granted) but no mechanism for providing a reliable update is considered.
- **Is it easy to find?** The traditional email list or personal contact may find resources. Websites often give a limited description of the resource leading to a failure in the search engines to find them.
- **Is there a benefit for providing the materials?** Learning and teaching resources, especially computer based ones, are expensive to develop. Small (and more specialised) courses can find it hard to justify, especially in the current economic climate.
- **Are the Intellectual Property Rights cleared for use or re-purposing?** This is not often apparent and potential users have been concerned about the risk.

The OER approach is growing internationally as a means to share and re-use resources for learning and teaching efficiently. 'Resources' in this context are all types of course material: software, assessments, booklets, full course materials, videos, images - anything that can be used or re-purposed and re-used. As a subject centre we often hear

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http://www.bioscience.heacademy.ac.uk/resources/oer/projectpartners_Biodiversity.aspx

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10 years supporting teaching in higher education to improve student learning across the Biosciences

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Resources:

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- Virtual Biochemistry Laboratories
- V.E.R.B. - Evolutionary History
- Virtual Rocky Shore

Open Educational Resources (OER) Project Partners

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Biodiversity Resources

Kevin Caley - Biodiversity Consortium

The resources below form part of the Biodiversity Consortium's "...World" suite. They examine an aerial survey of mammals in Kruger National Park (fieldwork regarded as 'exotic' and 'expensive'), surveys of a set of gravestones in North Yorkshire (and therefore an example of sampling sessile populations, alongside more general information on lichens) and a more theoretical unit that examines biodiversity indices and models.

Whilst elements of these could be used in conjunction with fieldcourse / lab work, their main aim is to provide tools for understanding the methodologies behind biodiversity analysis, and are therefore applicable to a wide variety of areas.

If you have any feedback regarding these resources, please let us know using the Comments form at the bottom of the page.

OER Resources in JorumOpen

Biodiversity Consortium : Measuring Ecological Diversity 1 : full version
Biodiversity Consortium : Measuring Ecological Diversity 2 : Components of Ecological Diversity
Biodiversity Consortium : Measuring Ecological Diversity 3 : Measuring Abundance and Diversity
Biodiversity Consortium : Measuring Ecological Diversity 4 : Sampling Spatial Diversity
Biodiversity Consortium Kruger World 1 Raw Data
Biodiversity Consortium_KrugerWorld_ORP_1_raw_data
Kruger World
Kruger World 3 : Overview
Kruger World 4 : Mammals
Kruger World 5 : Field Guide
Kruger World 6 : Surveying the Mammals of Kruger
Lichen World 1 : Lichen Biology
Lichen World 2 : Lichen Biology and Surveying
Lichen World 3 : Raw Data


The above resources are also mirrored at: http://ibis.nott.ac.uk/oer_biodiversity_units.html.

The Biodiversity Consortium has a long record of producing online tutorials in biology, stretching back to 1992, when it was originally set up. At its height, the consortium consisted of 50 member institutes in the UK, as well as some international partners in its later reincarnations. After a period of four years absence, we are attempting to revitalise the Biodiversity Consortium by releasing select material to the OER, and thus raise our profile. In 1997-2000... under the guise of the Virtual School of Biodiversity in the University of Nottingham... we were among the first, if not the first, establishment to lead an

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These resources are also accessible directly in:



ImageBank

start

Open Educational R... OER resources Microsoft PowerPol... Christopher Taylor [... Adobe Photoshop

20:48



HOW you can contribute

- Download and use the resources in your own teaching
- Build on and enhance the resources and share your enhancements back to the community
- Give either us or the creators constructive feedback or information on how you've used them
- Create your own OER and upload for others to benefit
- Promote OER amongst your colleagues



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