ID-01 Interdisciplinary Project: Mapping Research Skills within Undergraduate Curricula

This interdisciplinary project was divided in to three parts:

- The *Overview Skills description* where the aim was to explicitly promote the embedded nature of research skills within undergraduate curricula to both prospective and current students, as well as staff;
- The *Research Skills Audit Tool* which allows module co-ordinators to audit where and how in the curriculum research skills are taught and assessed; and
- The *Research Skills Workshops and Linked Questionnaires* where the aim was to raise students' awareness of their own skills development and to engage them with opportunities to conduct research.

Research skills in this project are defined as combinations of the University's (revised) transferable skills (communication; interpersonal; learning; numeric; self-management; use of IT and problem-solving) and discipline-specific skills (cognitive, practical and technical). This aligns with the 'Employers' Criteria' recently outlined in the HEA's 'Student Employability Profiles' (2006).

The project overall has been successful in developing the three tools. The Research Skills Audit Tool in particular is proving to be of increasing interest to other disciplines outside of the core CETL areas, as well as to other HEIs. The Audit Tool is also likely to become embedded through the Pathfinder project within the University's procedures for departments undertaking Periodic Review.

Project Code: ID-01A **Discipline: Interdisciplinary Projects** **Project Title: Research Skills Mapping - Overview Skills Description**

Description: The project aim is to explicitly promote the embedded nature of research skills T&L within undergraduate curricula to both prospective and current students, as well as staff.

A **What is the perceived problem or challenge?**	B **Enabling Factors** What resources will facilitate the project?	C **Processes** How is this project going to be achieved?	D **Objectives** What is the end product or result of the project?	E **Evaluation Data** What methods can be used to demonstrate the success or impact of this project?	F **Unintended consequences** What have been the unintended consequences of enacting this project?
Student Perspective: Undergraduates are acquiring skills implicitly but are not always aware of the skills they have developed; they may not therefore be effectively articulating their strengths to potential employers. **Staff Perspective:** Promoting the benefits of studying at a research-intensive university could help maximise recruitment. Promoting the emphasis on research skills development will make more explicit the skills learning opportunities for students studying different degree programmes.	**Staffing** The Innovation Manager will lead the project. A Teaching Associate will be employed within Typography to develop the skills overview description with the Innovation Manager. **Institutional Processes** The 5-year cycle of periodic review can provide a useful focus for different teaching teams to evaluate their programmes.	A template will be developed that provides a qualitative overview of the research skills that students will acquire by studying at Reading. The aim will be to explicitly promote the embedded nature of research skills T&L within undergraduate curricula to both prospective and current students and staff. The template will be adapted from one developed at the University of Calgary (a 'research intensive' university). Mechanisms for disseminating the pilot through the University will include, for example, Faculty Boards for Teaching and Learning; the University Teaching and Learning Conference; School and Departmental presentations; and University Teaching and Learning publications (e.g. 'Teaching Matters').	**Student Perspective:** Prospective, current and graduate students will have an opportunity to explore degree programmes from a skills perspective through engaging with the overview skills descriptions. **Staff Perspective:** Staff will be able to better inform prospective and current students about the research skills learning opportunities within different degree programmes.	**Evaluation by staff:** Focus groups. Feedback from admissions tutors on how useful overview skills description is for marketing and recruitment (e.g. via pro-forma). **Evaluation by students (longer term):** Feedback on usefulness of overview skills description for thinking about the skills they're developing as they progress through their degree programme Feedback from students on whether or not the overview skills description has helped them to better articulate their skills to employers. **Evaluation of National Impact** Log of dissemination events and publications. Logging adoption of this methodology at other HEIs.	Could prove to be a useful resource for Open Days and/or for updating School websites.

Project Code: ID-01B **Discipline: Interdisciplinary Projects** **Project Title: Research Skills Mapping – Research Skills Audit Tool**

Description: The project allows module co-ordinators to audit where and how in the curriculum research skills are taught and assessed.

A **What is the perceived problem or challenge?**	B **Enabling Factors** What resources will facilitate the project?	C **Processes** How is this project going to be achieved?	D **Objectives** What is the end product or result of the project?	E **Evaluation Data** What methods can be used to demonstrate the success or impact of this project?	F **Unintended consequences** What have been the unintended consequences of enacting this project?
Student Perspective: Undergraduates are acquiring skills implicitly but are not always aware of the skills they have developed; they may not therefore be effectively articulating their strengths to potential employers. **Staff Perspective:** Increasing modular choice provides excellent educational opportunities but can make it difficult for programme co-ordinators to 'audit' research skills teaching, learning and assessment. Programme Co-ordinators need to know how and when research skills are being taught and assessed within a programme to facilitate effective and systematic curriculum development, e.g. by identifying both good practice as well as gaps in research skills teaching and learning provision. Quality Assurance audits (periodic review) benefit from a clear mapping of skills against the curriculum. There is no set guidance or methodology for doing this.	**Staffing** The Innovation Manager will lead the project. A Teaching Associate will be employed within Agriculture to work with the Innovation Manager to develop a research skills audit tool. The Archaeology Teaching Associate and the Undergraduate Learning Officer at MERL will be involved in piloting the research skills mapping methodologies. **Software** Access to specialist software developed at the University of the West of England, 'Profile', has been purchased for this project. **Institutional Processes** The 5-year cycle of periodic review can provide a useful focus for different teaching teams to evaluate their programmes.	A quick & easy to use 'off-the shelf' online resource will be developed for module co-ordinators to record information about the research skills T&L in their modules. 'Profile' software will allow programme directors to quickly collate data across modules to systematically generate programme research skills 'maps' for subsequent curriculum development review. Mechanisms for disseminating the pilot through the University will include, for example, Faculty Boards for Teaching and Learning; the University Teaching and Learning Conference; School and Departmental presentations; and University Teaching and Learning publications (e.g. 'Teaching Matters').	**Student Perspective:** Students will be more aware of the skills learning opportunities that exist within their degree through the generation of programme skills maps (as the final product of the research skills audit tool). **Staff Perspective:** Staff will be able to audit where and how in the curriculum research skills are taught and assessed in order to be able to identify good practice, skills T&L progression and potential gaps in skills T&L provision. The tool leads to the generation of discipline-specific skills lists, which can be used as the basis for discussions with employers re: skills expectations of graduates.	**Evaluation by staff:** Focus groups. Pro-forma for the research skills audit tool. Will seek feedback from staff on the usefulness of the skills audit tool for modular and programme review and change (via pro-forma). Feedback on the usefulness of the skills audit tool as a resource for preparing for Periodic Review. **Evaluation of National Impact** Log of dissemination events and publications. Logging adoption of any this tool at other HEIs.	Research skills audit tool as a resource to aid Schools/Departments in preparation for Periodic Review.

Project Code: ID-01C **Discipline: Interdisciplinary Projects** **Project Title: Research Skills Mapping – Research Skills Workshops & Linked Questionnaires**

Description: The project aims to raise students' awareness of their own skills development and to engage them with opportunities to conduct research.

A **What is the perceived problem or challenge?**	B **Enabling Factors** What resources will facilitate the project?	C **Processes** How is this project going to be achieved?	D **Objectives** What is the end product or result of the project?	E **Evaluation Data** What methods can be used to demonstrate the success or impact of this project?	F **Unintended consequences** What have been the unintended consequences of enacting this project?
Student Perspective: Undergraduates are acquiring skills implicitly but are not always aware of the skills they have developed; they may not therefore be effectively articulating their strengths to potential employers. **Staff Perspective:** Students are acquiring a range of research skills but are not always able to clearly articulate and evidence their skills learning/competencies. Students are not always aware of the research opportunities available to them and may not therefore be making the most of their degree programme. Students may not be aware of the research currently taking place in their own Department/School. Quality Assurance audits (periodic review) benefit from a clear mapping of skills against the curriculum however there is no set guidance or methodology for doing this.	**Staffing** The Innovation Manager will lead the project A Teaching Associate will be employed within Zoology to work with the Innovation Manager to develop the questionnaires and workshop structure. **Institutional Processes** The 5-year cycle of periodic review can provide a useful focus for different teaching teams to evaluate their programmes.	A series of research skills workshops and questionnaires will be implemented to investigate student perspectives of their skills competencies and to examine their understanding of research from year one to year three. The aim will be to raise students' awareness of their own skills learning and to engage them with opportunities to conduct research. Questionnaires will be designed as a longitudinal study for students to reflect on their skills learning & development as they progress through their degree programme. Mechanisms for disseminating the pilot through the University will include, for example, Faculty Boards for Teaching and Learning; the University Teaching and Learning Conference; School and Departmental presentations; and University Teaching and Learning publications (e.g. 'Teaching Matters').	**Student Perspective:** Students will have enhanced opportunities to reflect on their research skills development and to better articulate and evidence their skills competencies as part of the research skills workshops and linked questionnaires. **Staff Perspective:** Staff will be able to track students' perceptions of their own skills development and their understanding of research as they progress through their degree programmes.	**Evaluation by staff:** Focus groups. Analysis of data from student questionnaires. **Evaluation by students:** Feedback from skills workshops and questionnaires. **Evaluation of National Impact** Log of dissemination events and publications. Logging adoption of these methodologies at other HEIs.	The questionnaires and/or workshops could form part of a School's PDP activities, alongside existing PAR/PDP initiatives.

ID01 Interdisciplinary Project:

Mapping Research Skills within Undergraduate Curricula

1. Project Progress and Timeline

1.1 Timeline

Done	Project stage post	planned end date	actual date
	Project start: November 2005		
☒	Meeting with TAs and Fellows to discuss project aims	Nov 05	Nov 05
☒	Agree project plan and timetable with TAs and Fellows	Dec 05	Dec 05
☒	Design and develop methodologies for research skills mapping	July 06	July 06
☒	National dissemination of project (HEA events)	Dec 06	Dec 06
☒	Internal dissemination of project via CCMS conference	Jan 07	Jan 07
☒	International dissemination of project (Ireland)	Feb 07	Feb 07
☒	Complete redesign of research skills audit tool v.2 and send to UWE	Mar 07	Mar 07
☒	Complete pilot of the 3 methodologies (Agriculture, Typography, Zoology)	Apr 07	Apr 07
☒	Further dissemination of methodologies at Reading	Apr 07	Apr 07
☐	Complete pilot of v.2 skills audit tool by other disciplines at Reading	Dec 07	
☐	National dissemination of project (Science L&T conference)	June 07	
☐	Internal dissemination of project outcomes at UoR T&L Conference	July 07	

1.2 Enabling Factors: Estimate resources used in this L&T-enhancement project

Between December 2005 and April 2007 this project has taken approximately 25% of the (0.4 FTE) Innovation Manager's time. Three Teaching Associates (TAs) from Agriculture, Typography and Zoology have been working closely with the Innovation Manager to design, develop and pilot three methodologies for research skills mapping, namely i) the 'research skills audit tool', ii) the 'overview skills description' and iii) the 'research skills workshops and linked questionnaires'. The methodologies differ in their complexity and this is reflected in the level of TA resource that has been required to drive the project forward in each of these disciplines (see Table 1 below).

The CETL Fellows from each of the disciplinary areas have also been involved in this project and their estimated input is given in Table 1. The TA in Archaeology and the

Undergraduate Learning Officer in MERL were involved in piloting the research skills audit and their approximate investment of time is reflected in Table 1. As this is an ongoing project there will continue to be an investment of staff resources, which are also estimated within Table 1.

Table 1: Estimated staff time spent on the research skills mapping project 2006-7

CETL Staff	Estimated time spent on research skills mapping project to date
Innovation Manager	25% (of 0.4FTE)
TA Agriculture	20%
CETL Fellow Agriculture	2% (of 0.1 FTE)
TA Typography	5%
CETL Fellow Typography	2% (of 0.1 FTE)
TA Zoology	15%
CETL Fellows Zoology	5% (total of 0.1 FTE)
TA Archaeology	2%
Undergraduate Learning Officer MERL	2%

To develop the *research skills audit tool*, one of the methodologies developed, it was necessary to buy access to 'Profile' software from the University of the West of England (UWE); the cost for this was £200. There will also be a small, additional on-cost for using this software (to cover support costs), details of which will be sent to us in 2007.

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

There have been two main challenges with this project. The first centred on agreeing a definition of 'research skills' for the CETL-AURS. This led to the generation of an all-encompassing definition of research skills being classed as a combination of the University's transferable skills (communication, use of IT, numeracy, team-work, self-management, learning and interpersonal skills) and discipline-specific skills (namely cognitive, technical and practical skills). This definition has been successfully adopted by the different CETL disciplines for this project.

The second challenge in delivering this project centred on the amount of time required to design and develop each of the three methodologies to map research skills. In particular, the *research skills audit tool* developed in agriculture and the *research skills workshops and linked questionnaires* developed in zoology took a considerable amount of time to design and develop (in comparison with the *overview skills description* template developed in typography); however, all three methodologies were still developed by the July 2006 deadline. Furthermore, post-development of the *research skills audit tool* and the *research skills workshops and linked questionnaires* there has been the need for significant additional investments of time to both pilot these approaches within Agriculture and Zoology and to encourage other (non-core CETL) disciplines to engage with these initiatives at Reading. An unanticipated challenge in Zoology involved the scheduling of the research skills workshops within the Parts 1, 2 and 3 timetables; although this has been overcome for 2006-7 it is anticipated that this will need to be reviewed each year.

Given the relative ease with which *overview skills descriptions* can be generated once the template had been developed, the *Innovation Manager* had anticipated that Typography would have taken the opportunity to pilot this approach to mapping research skills for other programmes within the Department (e.g. in order to review its potential impact as a useful resource for admissions tutors). The aim in 2007 will therefore be to encourage this to take place and evaluating its utility prior to encouraging other non-CETL disciplines within the University to pilot this model. In addition, there is a plan to use the *overview skills description* within Career Management Skills (CMS) discussion sessions in Typography, which will be actively encouraged by the CETL-AURS.
There will continue to be a 'tick-over' investment of time to ensure the successful methodologies are widely disseminated across the University (and beyond) and to ensure we are systematically capturing data to demonstrate the impacts of these methodologies upon both students and staff. The next big challenge is to encourage more staff both from within and outside the core CETL disciplines at Reading to engage with this generic project and this will require input from the *Innovation Manager*, *CETL Project Officer* and the *Teaching Associates*.

2. Outputs and Evaluation

2.1 List the evaluation evidence/data collected

Date	Quantitative or qualitative?	Evaluation by	Description / Method
Oct 06	Qualitative	Module co-ordinators	Evaluation pro-forma of the research skills audit tool
Oct 06	Qualitative	Programme directors	Evaluation pro-forma of the research skills audit tool
Apr 07	Both	Pt 1& 2 Students 06/07	Research skills questionnaire data
Jun 07	Both	Pt 3 Students 06/07	Research skills questionnaire data

2.2 Summarise the key results from your data

The project has led to the development of three methodologies to 'map' research skills within undergraduate curricula.

The research skills audit tool (tutor focused) – Developed in Agriculture

Preliminary data show that the '*research skills audit tool*' has been effective in encouraging staff to reflect on the methods they use to teach and assess research skills. In particular, this tool has led to some staff making changes to their modules, e.g. in terms of redeveloping *Module Description Forms* to better articulate the research skills learning opportunities within their modules. Feedback from Programme Directors on the '*research skills audit tool'* has shown it to be a useful resource for collecting skills-data across modules (see section 3.2). This has led to the realisation that the tool is indeed a useful 'off-the-shelf' resource to aid staff in preparing for 'Periodic Review', and a number of non-CETL disciplines wishing to pilot this resource throughout 2007, including Classics, Social Work, Meteorology and Politics and International Relations.

The research skills workshops (Student self assessment) – Developed in Zoology
Preliminary qualitative feedback from Zoology undergraduates who have taken part in the *research skills workshops* and who have also completed the linked research skills questionnaires indicates the usefulness of this systematic approach in capturing data on students' perceptions of research. Furthermore qualitative feedback from these students shows that the linked nature of the questionnaires and workshops is an effective way of encouraging them to reflect on their own skills-learning and development. The longitudinal nature of this methodology (i.e. tailored workshops and questionnaires from Parts one to three), however, means that we will have to wait a further two years before we are able to conduct analyses of how individual students' perceptions of research and their skills development may have changed over the course of their degree programme.
The overview research skills description (recruitment focused) – Developed in Typography
The impact and utility of the 'overview skills description' has yet to be investigated, though the method was a core element of the way the University of Calgary re-defined and described its own programmes as a way of showing to applicants what it was like to study at a research-intensive university. If more disciplines adopt this methodology it will be possible to compare the usefulness as, for example, a resource for Visit/Open Days by admissions tutors.

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

Overall the project has been highly successful and has been disseminated on a number of levels both within the University and beyond. We set out to develop three methodologies to 'map' research skills within undergraduate curricula and we have achieved this on schedule. In particular, the *Innovation Manager* has benefited from working closely with the CETL-AURS *Teaching Associates*, whose dedication and enthusiasm has been instrumental in helping to drive this project forward in each of the core disciplinary areas. The *research skills audit tool* has been a particularly innovative development and has facilitated engagement of the CETL with a number of non-core CETL disciplines within the University. It has also facilitated dissemination (and potential future collaboration) with other HEIs, both nationally and internationally (e.g. the University of the West of England, University College Cork, Ireland, University of Adelaide, Australia) who have expressed an interest in this resource, along with the Enquiry-Based Learning CETL Alliance. The development of the *research skills workshops and linked questionnaires* took longer than anticipated, however, the end result will enable us to collect and analyse data that we believe will be of considerable interest to those within the CETL and beyond. The *overview skills description* also took longer than anticipated to finalise but this is likely due to the fractional nature of the TA appointment in this discipline.

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?

To date the *research skills audit tool* has been piloted by 21 staff within the School of Agriculture, Policy and Development across three degree programmes: BSc Rural

Environmental Science, BSc Agricultural Business Management and BSc Biotechnology. This has impacted on approximately 100 students altogether.
The tool has also been piloted by the *Undergraduate Learning Officer* in the MERL (as a resource to support the development of new museum-based modules) and by a limited number of staff in Archaeology (all will eventually be surveyed).
The *research skills workshops and linked questionnaires* have impacted on 28 Part one, 29 Part two and 33 Part three students to date. The *overview skills description* has currently involved input from four staff within the Department of Typography but has yet to be used as a 'mainstream' resource for Visit/Open Days.

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

The ***research skills audit tool*** has provided a quick, 'off-the-shelf' resource for academics to review and reflect upon research skills teaching, learning and assessment within their modules/programmes. Preliminary feedback indicates that staff have found this resource both practical and useful and this is borne out by the fact that some have already made changes to their modules as a result of using the tool. For example, 83% of staff who used the tool in Agriculture either agreed or strongly agreed that the audit tool was user-friendly; over 80% agreed or strongly agreed that it helped them reflect on their teaching and assessment methods and the information provided in the Module Description Forms (MDF), and that they would implement changes to their MDF as a direct result of using this resource. Indeed, several module coordinators indicated that the audit tool had led to them review the methods of assessment they were using and had raised questions regarding an apparent lack of formative assessment within their modules. We therefore believe that the *research skills audit tool* has been a success both in terms of its ability to quickly generate detailed research skills information within and across modules but also in terms of its use as a resource to support reflection on skills teaching and assessment. In addition, through effective dissemination across the University, colleagues from a wider range of disciplines outside the core CETL areas are now keen to use this tool, for example, as a resource to prepare for Periodic Review.
The ***research skills workshops and linked questionnaires*** now provide students with an opportunity each year to specifically reflect on their research skills learning and development; such opportunities for reflection were previously not available to them. In addition, (anonymous) data from these workshops and questionnaires will give staff insight into students' perceptions of research and will demonstrate if/how these perceptions changes of over time; this is something that in previous years was not captured in any systematic manner.
The ***overview skills description*** provides staff with a user-friendly template to illustrate, within one page of A4, the opportunities for a student to develop their research skills by studying a particular degree programme at Reading. We see this as being a particularly useful resource for admissions tutors, which in turn may aid student recruitment in certain areas. The Department of Typography have expressed an interest in making use of this resource for future Visit/Open Days and admissions-related events.

3.3 Summarise the unforeseen consequences of this project

The unintended consequences of this project are summarised in Table 2.

Research Skills Methodology	Unintended Consequences
Overview Skills Description	1. Could be a useful resource for distributing at Visit/Open Days. 2. Template may feed into Department/School website materials.
Research Skills Audit Tool	1. Can be used as an 'off-the-shelf' resource to prepare for Periodic Review. 2. Can be used for School/Departmental reviews of research skills teaching, learning and assessment.
Research Skills Workshops and Linked Questionnaires	1. Could form part of a Department/School's Personal Development Planning (PDP) activities, alongside existing University PAR/PDP initiatives.

4. Dissemination

4.1 Log dissemination activities relating to this L&T Project

Date	Main Audience	Type	Dissemination activity
July 06	UoR staff within core CETL disciplines	Information/ Action	Workshops for staff
Aug 06	UoR staff	Information	Presentation to CAS and CCMS staff
Aug 06	UoR staff	Action	Workshop for staff
Sept 06	UK Academics	Information	HEA Bioscience Reps. Forum presentation
Oct 06	UoR staff within core CETL disciplines	Awareness/ Action	Teaching and Learning Committee papers
Nov 06	UoR Staff	Awareness	Article in 'Teaching Matters'
Nov 06	UK Academics	Information	Article in the HEA Centre for Bioscience Bulletin
Dec 06	UK Academics	Information	HEA research event, London
Jan 07	UK Academics	Information	Publication in HEA journal (BEE-j)
Jan 07	UK Academics and UoR staff	Information	CCMS conference presentation
Jan 07	UK Academics	Information	Case study in new HEA linking T&R publication
Feb 07	UoR staff	Information	Faculty Boards for Teaching & Learning
Feb 07	International academics	Information	Presentation at University College Cork, Ireland
Feb 07	International academics	Information	Email exchange of methodologies with Uni. Adelaide
Feb 07	UK Academics	Information/ Action	Meeting with LearnHigher CETL (Uni Lincoln)
Mar 07	UK Academics	Information	CETL networking event, Warwick

June 07	UK Academics	Information	Presentations at the National Science L&T Conference
July 07	UoR staff	Information/ Action	Presentation at UoR T&L Conference

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

The project has led to the development of case studies ('research skills audit tool'), which have been published as part of a pedagogic research paper in a peer-reviewed education journal. There might be scope to conduct a (long-term) pedagogic study into the effectiveness of the research skills workshops/questionnaires as a methodology to collect data on students' perceptions of research and of their understanding of their own research skills development.

Project Developer's names:

Dr Anne Crook	CETL Innovation Manager
Dr Gillian Fraser	TA Agriculture
Dr Nick Paling	TA Zoology
Dr Eric Kindel	TA Typography
Dr Julian Park	CETL Fellow Agriculture
Dr Amanda Callaghan	CETL Fellow Zoology
Dr Graham Holloway	CETL Fellow Zoology
Professor Sue Walker	CETL Fellow Typography
Dr Laura Cripps	TA Archaeology
Rhi Smith	Undergraduate Learning Officer, MERL