Linking disciplinary research with teaching at Napier University:

case studies of practice

NAPIER UNIVERSITY
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Foreword

The case studies of practice contained in this compendium reflect the wide-ranging approaches that staff at Napier University are employing to link disciplinary research with teaching. They provide a rich resource which staff can use to gain ideas for use within their own context and to benefit from the experience of others in implementing them.

The case studies were collected in the context of the QAA Enhancement Theme: Research-Teaching Linkages – Enhancing Graduate Attributes (see Linda Juleff's national perspective on page 1) and form part of the numerous activities undertaken by Napier University in support of the theme (see Karen Thomson's summary on the Napier perspective on page 3). The case studies were compiled using an original template designed for this purpose by Professor Mick Healey of the University of Gloucestershire who kindly allowed us to amend it to gather additional information of particular interest within the Napier University, and the Scottish, contexts (see page 7 for pro forma). The University is grateful to him for this and for his stimulating Preface to this compendium (see page vii). I should like to thank all of the convenors of the School Learning, Teaching & Assessment Committees and School Research & Knowledge Transfer Committees who helped in the collection of the case studies. Thanks are also due, of course, to the contributors themselves.

Finally, I would like to express my gratitude to Linda Juleff, Karen Thomson and Shirley Earl for their work on the theme, and to Margaret Nairn for editing this compendium.

Dr. Peter Easy
Senior Vice Principal, Academic Development

Preface

> …universities should treat learning as not yet wholly solved problems and hence always in research mode
>
> (Humboldt, 1810 translated 1970, quoted by Elton, 2005, p.110)

Linking research and teaching is a topic of great international interest, particularly in Australasia, Europe and North America. In a world where research income is becoming increasingly concentrated in fewer universities and the boundaries between further and higher education are becoming more permeable, questions as to the role and nature of higher education are frequently being voiced. For many in universities a key feature of *higher* education is that teaching takes place within a research environment. This is not a new view, as is indicated by the above quote from Humboldt which was written at the founding of the University of Berlin in the early nineteenth century, but it is a view that is being challenged by some policy makers who advocate 'teaching only' universities. If we are to convince politicians that research needs to underpin higher education we need to show convincing evidence that students benefit from studying in a research environment. This compendium of case studies makes an important contribution to this endeavour.

During the last decade there has been an attempt to tease out what research-teaching linkages mean and how students may benefit from this nexus. As Paul Ramsden (2001, p.4) states: 'I believe that the main hope for realising a genuinely student-centred undergraduate education lies in re-engineering the teaching-research nexus'. There are four main ways in which the nexus operates (Jenkins and Healey, 2005):

1. learning about others' research
2. learning to do research – research methods
3. learning in research mode – enquiry based
4. pedagogic research – enquiring and reflecting on learning.

This compendium of case studies is concerned with the first three ways. They all involve linking discipline-based research with teaching and can involve *all* staff teaching in higher education. I am particularly interested in the third method whereby students are involved in producing knowledge and not just consuming it. There is growing evidence of the effectiveness of involving undergraduates in 'research', when appropriately designed, in enhancing the quality of student learning.

Research need not be restricted to RAE type discovery research. At Napier, as in my own University, there is much interest in applying research in professional and

in community-based contexts. To allow for this broader perspective we include Boyer's (1990) scholarships of discovery, integration and application (engagement) in our working definition of undergraduate research which

> describes student engagement from induction to graduation, individually and in groups, in research and inquiry into disciplinary, professional and community-based problems and issues, including involvement in knowledge exchange activities
>
> (Childs *et al*., 2007)

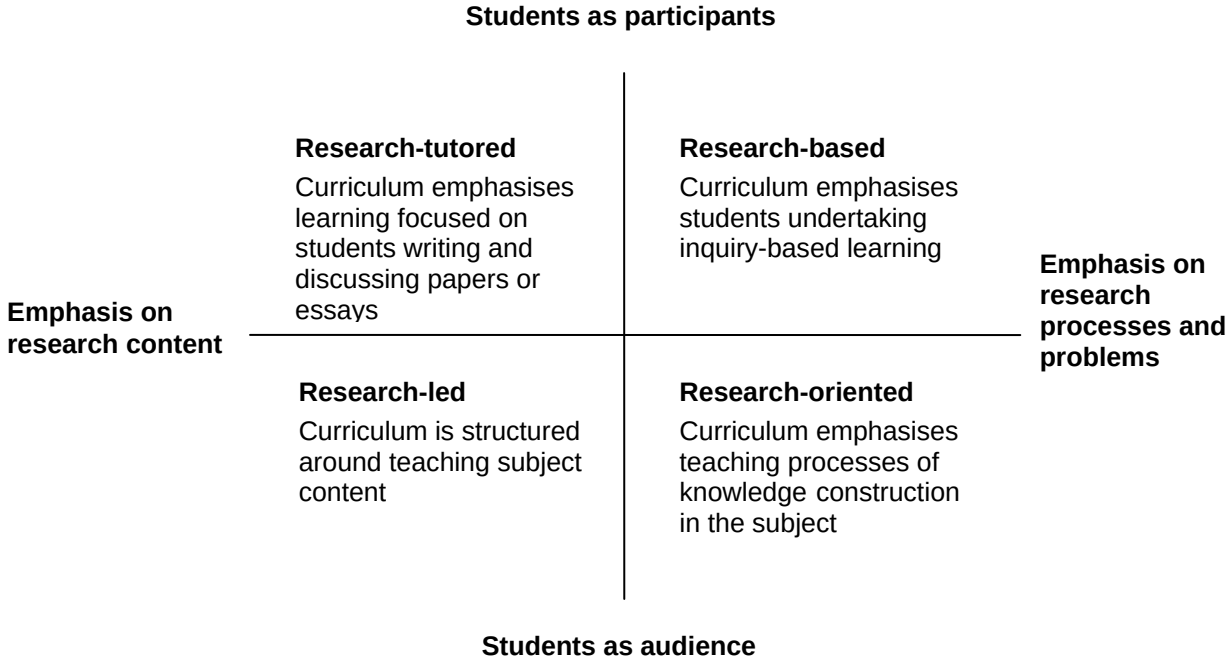
I have found the framework developed by Griffiths (2004) effective in supporting staff/faculty to examine both their current courses and institutional policies and practices and in adapting innovations from elsewhere. According to Griffiths teaching can be:

- research-led: where students learn about research findings, the curriculum content is dominated by faculty research interests and information transmission is the main teaching mode

- research-oriented: where students learn about research processes, the curriculum emphasises as much the processes by which knowledge is produced as learning knowledge that has been achieved and faculty try to engender a research ethos through their teaching

- research-based: where students learn as researchers, the curriculum is largely designed around inquiry-based activities and the division of roles between teacher and student is minimised.

These differences may be expressed diagrammatically using two axes (Figure 1). One classifies approaches to linking teaching and research according to the extent to which they are teacher-focused and students are treated as the audience, or student-focused and treat students as participants, while the second axis classifies the approach as emphasising research content or research processes and problems. Griffith's three categories map reasonably onto three of the quadrants. I describe the fourth category as 'research-tutored' where students learn in small group discussions with a teacher about research findings. Institutions, departments and individual staff have used the diagram in mapping their practices in linking research and teaching and identifying areas for development.



Source: Healey (2005, p.70)

Figure 1 Curriculum design and the research-teaching nexus

This compendium of case studies at the course level adds to those already published (eg Jenkins *et al*., 2007), those on many subject-centre websites and those being collected by other Scottish HEIs as part of the QAA Scotland Enhancement Theme on Research-Teaching Linkages. I commend them to you not only as examples of interesting practices but also to stimulate you to think about how you can develop linkages which will benefit your students' learning.

Professor Mick Healey
University of Gloucestershire

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Jenkins, A., Healey, M., & Zetter, R., (2007). *Linking teaching and research in departments and disciplines*. York: The Higher Education Academy. Available at www.heacademy.ac.uk/ourwork/research/teaching [accessed December 2007]

Ramsden, P., (2001). Strategic management of teaching and learning. **In** Rust C., (ed.) *Improving student learning strategically*. Oxford: Oxford Centre for Staff and Learning Development, pp.1–10

The QAA Research-Teaching Linkages: Enhancing Graduate Attributes enhancement theme – the national perspective

The Scottish Higher Education Enhancement Committee (SHEEC) initiated work on the Research-Teaching Linkages enhancement theme in March 2006. Following a consultation across the Scottish Higher Education sector a scoping paper for the theme was produced which formed the basis for the early discussions of the Steering Group appointed in July 2006. During 2006/07 a range of resources relating to the theme was collected, which can be accessed via the enhancement themes website at www.enhancementthemes.ac.uk/themes/ResearchTeaching/default.asp [accessed December 2007].

As a result of this information gathering process, it was decided to augment the title of the theme to better capture its focus on enhancing the learning experience of students on taught programmes of study. The result was the re-naming of the theme as 'Research-Teaching Linkages: Enhancing Graduate Attributes'.

The principal focus of the theme is, therefore, to identify the ways in which research strategies and activities can be used to support students as learners. In particular the theme is investigating the ways in which students can be encouraged to develop research-related graduate attributes, such as the ability to use appropriate techniques of analysis and inquiry, which are increasingly necessary for their future careers. A full list of graduate attributes can be found on the theme website above.

In seeking to develop these attributes, issues of curriculum development, learning, teaching and assessment strategies, and the general learning environment inevitably arise, and indeed these are reflected in the case studies included in this compendium. There is much debate across the sector regarding how and when the various skills and attributes should be introduced to students within a taught programme framework, and the extent to which students at different levels can be encouraged to engage with, and to undertake, research.

It should be noted at this point that a wide definition of what is meant by the term 'research' has been adopted by the theme which includes: practice and/or consultancy led research; research of local economic significance; contributions to the work of associated research institutes or other universities; and various types of practice-based and applied research including performances, creative works, and industrial or professional secondments. There is also an emphasis on the wide-ranging and inclusive nature of research which goes well beyond the confines of the Research Assessment Exercise (RAE) and includes all of the forms of research and scholarship in which Napier staff habitually engage.

This definition reflects in part the differences in practice across disciplines, the capturing of which is seen as an important part of this theme. To this end, the work of the theme is being carried forward both at institutional level and at subject level through the commissioning of both a sector-wide project and nine subject-based projects in the following areas of arts and social sciences, business and management, engineering and the built environment, creative and cultural practice, health and social care, information and mathematical sciences, life sciences, medicine, dentistry and veterinary medicine, and physical sciences. This compendium of case studies represents part of Napier's contribution to the sector-wide project and contributes to the first seven of these projects which span the University's principal subject based activities.

Work on the theme will be continuing into 2008 with reporting of the outcomes from both the sector-wide and the discipline-based projects. This will be followed by a series of dissemination events to give universities across Scotland the chance to enhance their current practice in this area. The examples of good practice contained in this compendium already go some way towards this process as far as Napier is concerned. We hope that these case studies will encourage staff to think about the ways in which they can enhance their own practice, but equally the outcomes of the QAA theme will provide further opportunities in this regard.

Dr. Linda Juleff
QAA Steering Group representative, Napier University

The QAA Research-Teaching Linkages: Enhancing Graduate Attributes enhancement theme – the Napier University perspective

Within the spirit of QAA Scotland Enhancement Themes, Napier University's response to Research-Teaching Linkages: Enhancing Graduate Attributes has been essentially pragmatic. As with any theme, the title is a convenient shorthand which can sometimes be misunderstood or dismissed against a perception of an ever increasing series of demands on staff. However there are many facets within the practices at Napier University which are consistent with, and show good practice in respect of this theme. The institutional approach to this theme at Napier therefore has been one of awareness raising and practical engagement both at strategic level and at the teaching, learning and assessment interface with students.

Against this background of practical engagement the theme was outlined at a strategic level at the beginning of 2007 to both the University's Learning, Teaching and Assessment Committee and the Research and Knowledge Transfer Committee in order to brief both research focused and LTA focused members of the University's management team. In May 2007 the theme was further discussed at a different management level through meetings of Faculty Convenors of LTA and RKT committees and on 24 May 2007 a workshop was given on RTL at the University's Management Forum (Vice Principals, Deans, Heads of Schools and Associate Deans) again, with briefing to a further layer in the University's organisation.

While this was working its way through the matrix structure, there were opportunities for all staff to attend two events as part of the staff development programme. The first event was on 26 April 2007 when Professor Mick Healey ran a workshop to explore the breadth and richness of research teaching linkages and the many ways they are being, and can be incorporated into, the curriculum. The second event took place on 20 June 2007 with Dr. Simon Barrie, a guest of the QAA from Sydney, who made explicit the link between research-teaching linkages and graduate attributes and the interesting and wide debates which are associated with 'research-mindedness'.

In June and July 2007 case studies from staff exemplifying the active and explicit use of research-teaching linkages in their work to enhance graduate attributes were gathered and these are presented within this compendium. The vision is for this compendium to be used as a source of ideas, a resource for members of staff who may like to implement some of the methods highlighted and a realistic view of the practicalities of using these methods within the learning, teaching and assessment environment.

In September 2007 a University-wide Oxford Union style debate was held, well attended by both teaching staff and research staff. The motion was

> that this house believes the link between research and teaching should be an integral part of every Napier student's experience.

Overwhelmingly the house voted in favour of the motion and the whole exercise elicited much lively discussion in the area of research-teaching linkages and its relationship to the desirable attributes we wish to foster in our students.

At the time of writing the work continues. The president of Napier University Students' Association has been consulted in order to work on pulling together views from our students' perspectives about their experiences of the links between research and teaching in the programmes they studied and whether there is anything which they feel would have enriched the experience for them which could have a positive impact on future curricular developments.

The Staff Conference in January 2008 is devoted to this theme and will feature keynote presentations from Professor Andrea Nolan, University of Glasgow, who is the chairman of the steering committee and Professor Mick Healey, University of Gloucestershire, who is an adviser to the theme and has published widely on research-teaching linkages. The conference is open to all members of staff and will feature workshops from the contributors of some of the case studies from this compendium, along with poster presentations and papers giving participants the opportunities to explore relevant activity within the University.

Further information about the day can be found on the website developed in association with the conference. This includes details about the theme, summaries of individual inputs and a PDF version of this compendium available at www2.napier.ac.uk/ed/staffconference/jan2008/publications.htm

The link between teaching and research is very much consistent with ongoing good practice within the University and through further dissemination of the ongoing work across Scotland this theme is likely to become further embedded in our practice and seen as a mainstream part of everyday teaching, learning and assessment activity.

Dr. Karen Thomson
QAA RTL Institutional Contact, Napier University

List of contributors and case study titles

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Case study pro forma

Linking Disciplinary Research with Teaching

Case studies for Napier University Compendium

First consider this:
While the understanding of how to link research/knowledge transfer and teaching is still developing, we think this 'classification' may help you describe your practice to others:

1. Developing student appreciation of research/knowledge transfer in the discipline.
2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).
3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).
4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').
5. Giving students first-hand experience of research based knowledge transfer (whether commercial or pro-bono) (eg as an 'intern', as work-based learning, as a consultant assistant, or as a laboratory assistant).
6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

While we hope you may want to complete all sections in the pro-forma, we only 'require' you to complete sections 1 to 6 below: and then you are automatically included in the prize draw for the £50 voucher for your faculty (but we hope you will also complete the rest!). **Note: it is section 6 that is most important and for entry to the prize draw needs to be a minimum of 500 words**.

1. Title of case study *(such that it conveys to others the central aspects)*

2. Contact details

***Name and school/centre**:*	***Tel:*** ***Fax:*** ***Email:***

3. Classification category *(please choose one or more of the classifications above which best reflects your example – eg 1. Developing student appreciation)*

4. Context

- **Course/unit/module title**:
- **Course title**:
- **Level and trimester/year introduced**:

5. Graduate attributes developed *(please tick all that apply)*

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

6. What does the researcher/teacher do? (*eg content, teaching and learning methods, assessment etc) Please ensure this section is written such that staff elsewhere can take the central elements from your practice. Write it like a 'good' cook book! There is no word limit to this section, but for entry to the prize draw this section needs to be between 500 and 800 words in length.*

7. Things to look out for and tips *(What is the key advice you would give someone who has decided to adapt this method?)*

8. Does it work? *(Student, employer, peer review/response/reaction? What does evaluation and/or research reveal as to its impact?)*

9. What problems/issues have arisen?

10. Areas to be developed/enhanced

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

12. Relevant references *(to published articles/websites by you or others that describe this method – optional)*

Please return to Linda Juleff, School of Accounting, Economics and Statistics, Craiglockhart, or email l.juleff@napier.ac.uk by no later than Monday 18 June. Thank you.

Bringing theory into practice: locating staff research in the undergraduate classroom

Dr. Chris Atton, School of Creative Industries
Email: c.atton@napier.ac.uk

Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Module title**: Alternative and Radical Media
- **Course title**: taught on BA(Hons) Journalism; BA(Hons) Cultural and Media Studies; BA(Hons) Publishing Media
- **Level and trimester/year introduced**: final year undergraduate, introduced in trimester 2, 2002.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry.

What does the researcher/teacher do?

Preamble

When this module first began in 2002, it was, to the author's knowledge, the first university course in the world to introduce students to a wide range of media produced by amateurs; citizen journalism, fanzines, personal websites, independent record production, blogs and other forms of non-professional cultural and political production. The rationale behind the module was to introduce students to what was, when it began, still an

emerging field. The module leader (who also delivers all the classes) is an internationally recognised researcher in the field.

As a final year, undergraduate module, and in common with most modules at this level, it requires a high level of theoretical and critical understanding from students. At the same time it forms part of a suite of options for degree programmes that balance vocational and theoretical knowledge; it is important, therefore, to encourage students to appreciate the linkage between the two. It is a very popular option module; it attracts the greatest number of students of all option modules in the school. Students are drawn from degrees in journalism, publishing media, and cultural and media studies. It is necessary, therefore, to design the module so that no students – whatever their academic knowledge and vocational skills – are excluded.

Method

How is this coming-together of theory and practice achieved? It begins by bringing contemporary research into the classroom through lectures that highlight current developments in the field (such as the use of social networking sites like MySpace and Facebook for amateur reviews of popular culture) and critical debates (are the reviewers on MySpace journalists? Who is publishing whom?).

The key to these lectures is to begin with practice. This means starting with observations and descriptions of a practice, then how theory might help us understand this; or rather, theories – for a multi-perspectival approach presents two advantages. First, it enables students to appreciate that there might be no overarching, totalising theory to explain the world (or even a small part of the world); second, it shows students that real-world practices might be explained in very different ways. Together, the two help develop critical understanding of practices and theories, and how knowledge is created and renewed, with all the provisionality that implies.

Tutorials then become fora for examinations of these various perspectives. When tutorials are mixed (that is, when they contain students from different degree programmes) the opportunities for interchange, comparison and perspective are significantly increased. However, even when a tutorial contains students from a single degree programme, diversity of approach is still possible. Journalism, for instance, in addition to attracting students who hope to become professional journalists, also attracts students interested in production and management, those who wish to put journalism at the service of a cause (‘democracy’ or a more specific cause such as politics or environmentalism) as well as those who find the subject intrinsically interesting.

This approach is achieved by closely linking lecture content and tutorial participation. In short, the knowledge presented in each lecture is explored in tutorial work that is driven both by group discussion and by individual student

presentations. Student contributions are then fed into subsequent lectures. The following example presents the method in more detail.

Example: Alternative news on the internet

Lecture 1: Introduction to alternative news practices
A case study of Indymedia (a web-based international alternative news network) is presented, based on the lecturer's own research (for example, Atton, 2003a, 2003b and 2004). This highlights:

- methods of organisation (collective, egalitarian)
- dominant news themes (social movements, global protest, critiques of the mass media)
- styles of writing and sourcing (first-person narratives, participants as actors in the stories)
- editorial practices ('open publishing', anti-hierarchical).

Tutorial 1: Alternative news in context
To prepare for the tutorial, each student is given one of these themes to explore. They are expected to visit the Indymedia site to gather evidence of their own, with which they can add detail to the general features outlined in the lecture. According to their target degree, they must also draw on knowledge previously gained in other modules. For example, a journalism student might draw on their studies of sourcing in mainstream journalism (such as Stuart Hall's notion of primary definers); a publishing student might examine questions of authority and expertise in the editing process. They are encouraged to bring their existing theoretical knowledge to bear on the theme.

The tutorial explores each of the four themes in a group discussion, using the students' prepared work.

Lecture 2: Alternative news in theory
This second lecture brings together the main points from the students' own tutorial work. This enables students from different tutorial groups to learn about the issues raised. It also reinforces the multi-perspectival approach to the subject across the range of student disciplines.

The lecture goes on to introduce 'new' theory to the study of Indymedia. This includes work by theorists that only some students might have encountered (for example, journalism students are unlikely to have read Foucault) or theorists they might have encountered in another context (for example, Bourdieu's work on cultural production might have been explored only for its literary applications). Other theorists will not have been encountered by any of the students (such as Melucci's work on new social movements).

The key here is for the lecturer to be familiar enough with the intellectual trajectory of all the programmes from which students are drawn for this module. There are three advantages to this strategy. This enables links to be made with students' core subject studies, which gives the students confidence to explore what is for most (if not all) of them a new subject area. To demonstrate familiarity with students' existing knowledge also engages the students: they know that the lecturer is interested enough in them to have learned about their earlier work. Finally, the strategy avoids the intellectual fragmentation that can at times be the unintended outcome of a modular system.

Tutorial 2: Alternative news critiqued
Tutorial participation is part of the assessment scheme for this module. This is achieved through individual tutorial papers. In the second tutorial of the cycle two students present their papers, each on a different theme chosen from the four presented in the first lecture. (Each student on the module will have been allocated a slot for their paper in the first week of the trimester.) Students in this tutorial will have been expected to prepare for their papers from the beginning of this cycle (that is, from the first lecture).

Each student has fifteen minutes to explore the theme through the lens of relevant theory. They are expected to use theory to deepen their understanding of one aspect of Indymedia's practice (for example, organisation or news sourcing) and to offer a critique of both practice and theory (what questions does theory raise about a practice's ethics, effectiveness or ideology? How effective is theory in explaining what is going on in the practice?). After each presenter there is time for brief questions or observations from the rest of the students.

Lecture 3: New topic
The opening section of this lecture is used to summarise the key learning points from the students' experience of the above process. These are organised under the following headings:

- What empirical knowledge did we start with?
- How did our own research enhance this knowledge (empirically and theoretically)?
- What did 'new' theory add to our understanding?
- How were we able to develop critiques?

The lecture then introduces a new topic and the cycle begins again.

Things to look out for and tips

Ensure that during the theoretical exposition in lecture 2 connections are regularly made back to the practices described in lecture 1, and to the student work from tutorial 1. Without this being done explicitly, students from

the more vocational programmes might well not perceive the relevance to 'their' intellectual trajectory.

Does it work?

In bringing theory to practice, the module shows students how theory in action can lead to a richer understanding of the variety and the provisionality of processes of media production and reception. This is an important intervention, as many of the students taking the module have been equipped with strong empiricist outlooks (such as the journalist's mantra 'the facts speak for themselves') where practice is based on a limited set of options in the 'real world' and where opportunities for reflective practice (praxis) are limited. On the other hand, students studying cultural and media studies are used to theorising and conceptualising, but less skilled in bringing those theories to media practices and practitioners themselves.

The study of alternative media is a contested field (conceptually, definitionally and normatively). The dynamic nature of the field has at least two major benefits for students: first, it exposes them to debates surrounding the provisionality of knowledge and the positioning of the researcher (self-reflexivity). Second, it gives them permission to make decisions on and develop their own position – some of the best work submitted for the module has made modest but important contributions to the field of study. In one case, a student who took the module developed her work in her final-year dissertation. She produced original data that formed the basis of a refereed paper with the module leader (Atton and Wickenden, 2005). This is the first instance of an undergraduate student in the school publishing their work in an international, scholarly journal.

Student feedback on an earlier version of this approach indicated that they would value more time for reading and discussion (the first version had only one lecture and one tutorial). The model described here is in response to students' critiques. Since then, student feedback has been universally positive. The following are representative comments made on module feedback forms:

- 'tutorial sessions were very useful – gave opportunity for in-depth discussion'
- 'classes and assignments allowed for a wide range of perspectives to be considered'
- 'in allowing for the formulation of considered opinion, Chris is to be congratulated'
- 'the most well-organised and academic of my modules'
- 'intellectually stimulating, the classes are never anything other than a pleasure'.

Students frequently emphasise the value of linkage between theory and practice, and research and teaching.

What problems/issues have arisen?

Differing levels of theoretical knowledge across programmes: Cultural and Media Studies is a theory-rich programme compared with Publishing Media, where theory is explored only in isolated areas (such as management). This means that students on less theory-rich programmes will need more support in the first tutorial to identify and explore relevant readings. It is important to highlight this early on in the module, to encourage students to prepare in advance of the cycle in which their paper will be given.

Areas to be developed/enhanced

As research in the field continues to develop, so strategies need to be developed that capture developments without sacrificing depth for breadth.

Details of support material/course work/assessment methods

These are available from Chris Atton.

Relevant references

Atton, C., (2003a). Indymedia and 'Enduring Freedom': an exploration of sources, perspectives and news in an alternative internet project. **In** Chitty N., Rush, R. R. & Semati, M., (eds.) *Studies in terrorism: media scholarship and the enigma of terror*. Penang: Southbound Press, pp.147–164

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Preparing students for the Honours project

Dr. Maire Brennan, School of Health & Social Sciences
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Classification Category

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

Context

- **Course/unit/module title**: PS42038 Preparation for the Honours project
- **Course title**: BA (Hons) Psychology & Sociology and BA (Hons) Social Sciences
- **Level and trimester/year introduced**: level 11, trimester 1, 2006/07.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge

- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

In 2006/07 we introduced a new 15-credit, level 4 module for trimester 1 of year 4, which is designed to prepare students for the independent research they will undertake as required in the Honours project. In the preparatory module, students are taken through the early stages of formulation of a research question, choice of research design, searching appropriate literature and the development of the detailed proposal for data collection and analysis.

The introduction of the preparatory module in the first trimester of year 4 is designed to allow students to develop their proposal for their Honours project in a supported environment. Small group teaching allows students to be combined into areas of research, under the supervision of a member of staff (a Project Support Tutor) who shares those interests and is knowledgeable about the proposed methodology. The module is designed to bring students through the early stage of formulation of a research question, review of literature, design of data collection and methods of analysis.

The aims of the module are:

- To provide final year students with academic guidance and support in framing research proposals, identifying appropriate data collection and analytical techniques relevant to a piece of extended individual research.
- To mentor students through the initial stages of research, including the use of secondary sources, data collection and analysis and pilot studies.

To achieve these aims, students have a range of support available. For the first five weeks, whole group teaching sessions cover some basics such as review of research paradigms in the social sciences; what is required in the Honours project including what makes a good project; developing research skills including basic skills such as time and project management; concept mapping; framing a research question; reviewing literature for research; presenting a research plan.

In this group, they work with a Project Support Tutor who meets the group once a week from week 5 until week 12 to help with the development of the research. The focus of these workshops is on the research methodology, the development of an appropriate research question, the development of the literature review, the planning of the data collection and techniques for data analysis for the project. In these classes, students have the opportunity to discuss their project proposal with a member of staff and with a small number of other students.

Three assessment instruments are used:

1. **Outline project proposal** (20%): covers key points relevant to the initial formulation of a research question.

2. **Critical analysis of the literature** (30%): the purpose of this assignment is to help prepare for the literature review that will be a substantial chapter of the final project in trimester 2. It is assessed independently of the literature review in the Honours project. The assignment is in three parts:

Part A Information seeking
This part is a description of the processes undertaken to locate sources.

Part B Annotated bibliography
Covers at least 20 key sources that are relevant to the topic with an appropriate balance of summary, assessment and reflection.

Part C Critical appraisal of the sources
Finally, a narrative to draw the sources together to indicate:

- the key theorists and principal authors relevant to the research area
- the main theoretical debates or opposing views in the area
- the recent and current empirical work related to the research area
- the methodological approaches that are commonly used
- the debates on methodology
- the main conclusions about the research undertaken by others
- the areas that have been identified as needing further research.

3. **Presentation of research proposal** (50%): for the final assignment, students make a formal presentation of the research proposal to a group of peers and lecturers. The main item of assessment is a 15 minute presentation of the research proposal using PowerPoint®. In addition, students submit documentation to cover a concept map of the research topic, a work plan of the work to be undertaken in trimester 2 and a Faculty Application for Ethical Approval.

This module leads directly into the 30-credit module where students undertake an independent piece of research, which was developed in the first trimester. The Project Supervisor, who was assigned to the students in week 6 of trimester 1 takes over full responsibility for the project at this stage.

Things to look out for and tips

It is important that Project Support Tutors are matched to the *methodological* approaches of the students in their groups as this is the key area we are hoping to have an impact on. Students can also benefit from peer support in

the small group as they can assist each other in locating sources, identifying appropriate research methods and techniques for data analysis.

Does it work?

It is difficult to assess the impact as we have had only one presentation. Students varied in their evaluations, depending on the group they were in and the contributions of the other members of their group. Overall, the evaluations were very positive from those who attended regularly.

Staff who acted as Project Support Tutors considered that the module had helped those students who attended regularly, but at times found it difficult as they could not provide the specialist advice that a Project Supervisor would give. This was a new role and some areas of overlap were inevitable.

What problems/issues have arisen?

Matching students to Project Support Tutors was difficult as there was an uneven number seeking assistance with methodological areas. In addition, some students changed their projects radically and had to be re-assigned, making some groups larger than was ideal.

There were some problems in the transition to the Project Supervisors at the end of the module. Some students continued to seek help from the Project Support Tutors.

Areas to be developed/enhanced

- Clarity about the role of the Project Support Tutor and the interface between them and Project Supervisors.
- Assigning of students to Project Support Tutors.
- Next session, we are going to run workshops from week 2 to ensure that the early weeks are more interactive and students have an opportunity to focus on their research proposals and develop realistic research questions.

Details of support material/course work/assessment methods

A Module Handbook is available from Maire Brennan.

Using posters in a Psychology module

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Classification category

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

Context

- **Course/unit/module title**: PS32027 Practicals in Psychology
- **Course title**: BA (Hons) Psychology
- **Level and trimester/year introduced**: level 9, over trimesters 1 and 2, introduced 2004/05.

Graduate attributes developed

At undergraduate level:

- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to deploy techniques of analysis and enquiry
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

What does the researcher/teacher do?

In the third year of the degree programme, BA (Hons) Psychology students undertake a 30-credit module, Practicals in Psychology. To complete the module, they are required to undertake a range of investigative research techniques, analyse primary data and present results either in the form of a report or a presentation.

This case study relates to the assessment of the cognitive psychology practical where the students submit a poster with their findings and present this poster to a member of staff in a short presentation. The data on which

the results are based are collected by the student as part of a research group. The analysis is undertaken as a group activity but the final presentation of results and completion of the poster is the responsibility of the individual student.

Things to look out for and tips

It provides students with a very personal learning experience. They often put the posters up in their own rooms afterwards!

Does it work?

Student feedback is very positive about the frustrations and high points in preparing the poster.

What problems/issues have arisen?

Mainly about the logistics of organising the student conference and, for the students, some additional cost in having the A0 poster printed.

Details of support material/course work/assessment methods

Guidelines to students and other information is available from Maire Brennan.

Application of research to teaching practice

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Classification category

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: Strategic and International HRM
- **Course title**: as above
- **Level and trimester/year introduced**: trimester 1, 2006.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments.

What does the researcher/teacher do?

In level 4, in a specialist module titled Strategic and International HRM, Norma uses a chapter from her book[1] to form the basis of a three-hour tutorial where the students analyse a case study, answer questions and report back in a plenary session.

This shows the students an example of how research conducted by the lecturer is closely linked to the module content and is directly relevant to the module aims and objectives. This helps students gain added value from the lecturer's knowledge and expertise in the area.

The students have to answer questions based on either a book chapter or a journal article. The questions are designed to examine the students' knowledge and understanding of the topic area and also asks them to provide a critique of the methodology used. Students have to consider how the use of in-depth interviews in this particular context might have influenced the results obtained and consider the strengths and weaknesses of this approach. They are also asked to consider what other method the researchers might have utilised. Students are encouraged to ask the

lecturer/writer of the chapter questions about the research design, process, respondent reactions and limitations to help frame their responses.

Students find this a very useful exercise. They are year 4 students who are currently conducting research themselves for their dissertation so value the opportunity to consider different methodological approaches and see an example of one in practice and the strengths and weaknesses of this in-depth interview approach.

Things to look out for and tips

Be prepared for honest feedback from the students about how the approach could be improved.

Does it work?

Feedback is always very positive.

What problems/issues have arisen?

No problems but students are always very interested in how the research projects came about and how much research we do and how we find time to do it – it opens up lots of fruitful discussion.

Areas to be developed/enhanced

As I am an active researcher I try to use my work for at least one tutorial each trimester to show the students how what we do in the research area feeds into our teaching. This is not always easy depending on recent publications and teaching commitments.

Details of support material/course work/assessment methods

As this is a tutorial exercise, I do not have detailed guidelines and have alluded to the questions posed in an earlier section. These questions change according to the piece of research I am referring to.

Relevant references

[1] D'Annunzio-Green, N. The hotel expatriate in Russia, competencies for cross-cultural adjustment. **In** D'Annunzio-Green, N., Maxwell, G. A., & Watson S., (eds.) (2002) *Human resource management, international perspectives in hospitality and tourism*, London: Continuum

Valuing the link between teaching and research: under and postgraduate case study applications

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Classification category

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

Context

- **Course/unit/module title**:
  BSc (Hons) Estate Management – Planning and Development 3 (level 3)
  MSc Property and Construction Management (Property Asset Management)
  MSc Property Management and Investment (ditto)
- **Level and trimester/year introduced**: both under and postgraduate initiatives introduced in 2000.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge

- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

The review of 'what the researcher/teacher does' relates to the following modules:

- Planning and Development (an undergraduate level 4 module)
- Property Asset Management (a postgraduate level 7 module).

The first module is based on research undertaken as part of the European Commission's (EC) Environment and Climate Programme (Frameworks 4 and 5). The teaching of the second module draws on research carried out for the Royal Institution of Chartered Surveyors (RICS), the British Know-How Fund (BKHF) and Overseas Development Agency (ODA) into property asset management. Both modules draw on an extensive body of literature. Taken from the recommended reading for the modules, the teaching and learning strategies for each module have been designed to meet the appropriate under and postgraduate outcomes.

Both modules adopt the scholarship model of teaching and learning, where teaching and research are linked together because they are synergistic in promoting knowledge and applying such understanding to activities aimed at advanced learning. What both modules do is provide an opportunity for the pedagogy of research-led teaching to link teaching with research and connect this to learning, that is to learning which is promoted as much by the students as the academic staff who are responsible for the module. Here the research and taught components of the modules are led as much by the students as academic members of staff (see Table 1). This is because the research – data searching, information processing and communication of knowledge and understanding – is led as much by the students as academic staff and what is taught – by students *and* academic staff alike – promotes learning which is seen to be of equal benefit to all concerned.

Table 1 Research-led teaching strategies
Planning and Development (level 4), Property Asset Management (level 7)

Research-based teaching material provided by academic staff Research-based teaching information provided by academic staff In-depth case study examples provided by external experts In-depth case studies provided by external experts and forming loosely structured coursework assessments, aimed at data collection and synthesis through complex analysis, problem solving and critical evaluation	Individual student-led seminars requiring data collection, complex analysis aimed at problem, critical evaluation and synthesis Group-based seminars requiring the aforesaid, critical review of research forming the basis of the teaching material and reflection on the learning experiences Group-based reflection on learning outcomes, subject-based knowledge and understanding Class-based reflection on learning outcomes, subject based knowledge and understanding

In taking this form, the link between research and teaching is seen to be valuable because it provides:

- the resource base needed to specify the learning outcomes of the modules, the curricula forming the teaching material, assessment mechanisms and teaching and learning strategy

- the types of subject-specific understanding/knowledge and transferable skills

- the modules are designed to develop, by being synergistic, drawing on experiential learning at previous levels in an integrative framework of teaching and research.
  The main vehicle for this is the student-led seminars

- the teaching material needed to develop an in-depth knowledge and critical understanding of the subject supported by a reflective knowledge
  This is mainly achieved through the use of student-led seminars set up to critically evaluate the material from the learner's point of view

- the opportunity to develop high level transferable skills – in advanced problem-solving and critical evaluation – that in turn promote the enterprise, autonomy and lifelong learning which students need as graduates
  These are promoted by the use of problem solving skills, critical

evaluation and interpersonal skills needed to demonstrate such attributes

- the possibility of a constructive alignment between the learning, teaching and assessment of the modules – *the alignment between what can be demonstrated to be learnt, taught and assessed as standard measures shared across the students and academic staff engaged on the module*

- the option for this type of research-led teaching to complement more traditionally taught 'research methodology' modules and pave the way for 'dissertation-based' learning.
  The fact the research-led teaching gives the students prior experience of autonomous learning and how to develop such attributes as a lifelong learner, is seen to ease the path to dissertation-based learning.

Table 2 provides a summary of the information obtained from the interviews. It divides the students' experiences of research-led teaching into two columns: learning outcomes, skills, knowledge and understanding, and measures them in terms of how they cut across three levels of experience: low, middle and high. This evaluative framework is designed to gather information on the transformation of the student learning resulting from the typical experiences of high, middle and low quality research-led teaching.

Table 2 Student experience of research-led teaching skills learning

Learning outcomes	**Skills, knowledge and understanding**
High	data collection, complex analysis aimed at problem solving, critical evaluation and *synthesis and reflection* technical, procedural, theoretical, practical and *research-led*, subject based, transferable and *lifelong*
Middle	data collection, complex analysis aimed at *advanced problem solving and critical evaluation**,*** technical, procedural theoretical and *practical* subject-based and *transferable*
Low	data collection, complex analysis technical, procedural and theoretical

From Table 2, it is clear that the lowest value the students place on the link between research and teaching is that research-led teaching helps develop skills in data collection and complex analysis, this in turn being connected with technical, procedural and theoretical learning outcomes at the required level of subject-based knowledge and understanding. This also indicates that in addition, research-led teaching assists with the development of advanced problem solving and critical analysis. This itself provides a route to high level skill development in synthesis and reflection, the significance of

this lying in the fact that such skills provide evidence of technical, procedural, theoretical and practical learning outcomes which *are not taught but research-led*; that is to say providing a level of knowledge and understanding which is not only subject based, or transferable, but lifelong in terms of the attributes they engender in graduates.

Reflecting on some of the students' comments, the following is evident:

- students value the link between teaching and research, see the relationship as complementary and synergistic in nature, because research-led teaching allows them to participate in a meaningful exchange of learning experiences

- as much of the research is student-led, this type of teaching is seen as being valuable for the collegiate relations that develop, based on equal measures of mutual respect and trust, between staff and students

- the link between research and teaching is also valued because research-led teaching allows connections to be made that not only rely on the exchange of ideas, but a dialogue that in turn leads to the development of the skills which are not only needed to undertake complex analysis of given problems, but to also solve them through critical evaluation, synthesis and reflection

- the weight which high and middle range student experiences put on research-led teaching is seen to rest with the ability it has to constructively align what is learnt (as evidenced through individual, group and class-based seminars on subject-related matters) with what is taught (either by the students or staff) and what is assessed (in terms of the in-depth case studies forming the object of exams and coursework)

- there is also some evidence to suggest that the students with high-level experiences perceive research-led teaching as a measure providing the experiential learning needed to transfer high-level skills on to other, more heavily weighted student-led modules. Here there is evidence to suggest their experience of research-led teaching in not just positive on the modules in question, but progressive in terms of the bearing that learning has on the students' programme of studies

- while the aforesaid is of particular value and weighted heavily for those achieving high levels of skill development, knowledge and understanding similar, if not somewhat more limited, benefits are also recognised as having a bearing on the experiences of those students achieving either middle, or lower quality learning from the modules.

From this we can see that research-led teaching places particular weight on meaningful exchange, based on equal measures of mutual respect and trust between staff and students. That is to say, a meaningful exchange based on equal measures of respect and trust which has a bearing on the learning experiences needed to transfer high level skills to other, more heavily weighted student-led modules. As such it is evident that the students' experience of research-led teaching is both positive and progressive in the manner in which it has a bearing on high quality learning.

Underlying this there is evidence to suggest the students' experience of research-led teaching is such that learning is no longer seen as a passive activity, but an active process of 'learning by doing', something the student does and actively participates in, rather than has done to them. The experience is such that students tend to develop a view of learning as something which is highly iterative, where subjects are critically reviewed, reflected upon and constantly redefined in the interests of better knowledge and greater understanding.

Things to look out for and tips

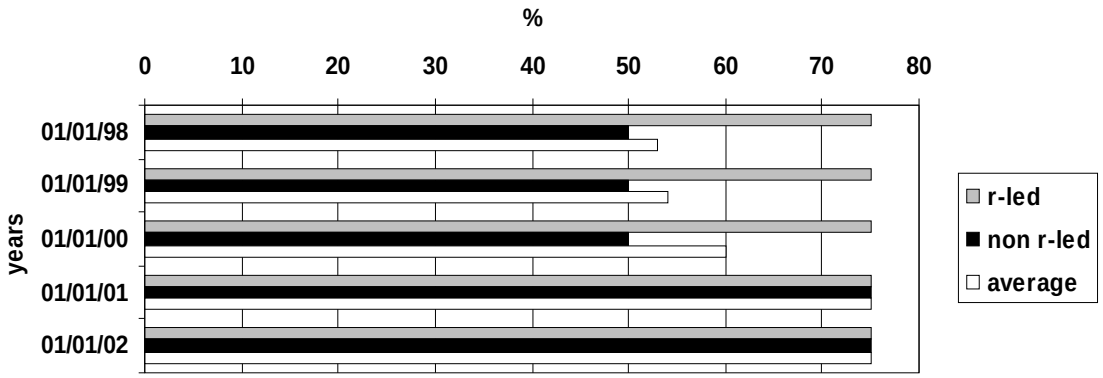
The success of the exercise is largely dependent on how well the students draw on the key references and use these as a framework to make sense of the underlying issues. It is all too easy for some students to miss the underlying message and to be unclear as to what the seminars are meant to achieve. It is useful to draw upon interim measures that check the use of the learning material and allow the students to outline what they propose to speak about during their presentations.

It is also common for the students to feel uncomfortable about criticising their colleagues and some tactful references to 'constructive criticism' are sometimes needed. In addition it is sometimes necessary to encourage the students to critically engage with the presentations made by other groups and reflect on what it means for their own contributions. For this exchange to be effective and for the students to effectively collaborate in the learning exercise, it is necessary to set out the terms of reference for the seminars and not only reiterate the object of the exercise, but the specific learning outcomes in terms of skill development, knowledge and understanding.

Does it work?

Figure 1 below shows the how students value the link between teaching and research in terms of the evidence drawn from their questionnaire returns on the two modules in question. As can be seen, over the five years in question, the students have been approximately 75–100% satisfied with the research-led teaching modules. Looked at against the index of all other modules on the two programmes, it is also noticeable the students' experience of research-led teaching is perceived to be more highly satisfactory than other modules for 1998/99 and the same for 2000/02. While this merely suggests

the students' experience of research-led teaching is only marginally more satisfactory for the first three years of operation and not 'out-of-line' with taught modules of a more traditional type, it is not able to indicate whether the value of linking teaching and research has any particular weight, or if the connection to research-led teaching has a particular bearing on the students' learning.



Source: Deakin (2006)

Figure 1 Student satisfaction with research-led teaching: 1998–2002

Clearly the questionnaire returns are too crude a measure to indicate the particular weight the students put on the research-led teaching, or what bearing it has on the learning experience. This is the object of the student interviews. These have been carried out as part of a module review process and take the form of semi-structured interviews designed to indicate whether the students place any weight on research-led teaching and if this learning experience is seen to be of particular value. In instances where the answer to the aforesaid has been 'yes', the exercise has gone on to clarify whether the link between teaching and research is of particular weight because the students' experience of research-led teaching is positive. The information gained from the interviews in question is qualitative in nature and takes the form of verbal statements by the students about their learning experiences. However, the statements are useful because they provide an indication of how the students weight such experiences and the bearing they have upon their learning. This is because they provide evidence of how students value the link between teaching and research and the positive connection research-led teaching has to progress knowledge and understanding by providing high quality learning at advanced levels.

What problems/issues have arisen?

The problems relate to the introduction of a novel teaching and learning technique into a standardised modular descriptor that focuses on teaching and not research as the main instrument of learning. This means you have to spend quite a bit of time explaining what research-led teaching is to the

students, how it differs from the other modules and what this means in terms of 'learning' activities, outcomes assessments etc. Furthermore, this is something the academic feels obliged to keep reiterating for the first four to five weeks of the module. The lecturer also needs to verse them in the style of learning – problem-based, open, discursive, participatory and so on – and again make sure they understand the object of the exercise is not to arrive at a 'pre-determined' answer, but to use reason and critical judgement in arriving at a set of conclusions and recommendations for further action. All this needs to be standardised as a requirement of research-led teaching modules.

You also have to deal with the anxieties they hold about their peers. These modules surface at advanced levels of learning and they have had three to four years to judge their peers and are wary about entering into participatory exercises with them. They need to be given the confidence to participate in open discussions and start to plan their own workloads before they can begin to start learning and become confident in using research as a means of venturing into what might best be referred to as 'self-taught learning exercises'.

Areas to be developed/enhanced

- introduction into research-led teaching and induction into the techniques, their value etc
- enhance student participation in the exercises by making sure they are engaging
- exploiting the students' enthusiasm for such learning experiences and capitalising on this
- using the technique for formative group-based assessment in class and some type of summative evaluation of their personal learning in the exam.

Details of support material/course work/assessment methods

Two examples of using teaching and learning processes that stimulate research processes are available from the LINK Good Practice Resource Database at
www.brookes.ac.uk/schools/planning/LTRC/outputs/EETP-html/EETP25.htm
[accessed December 2007].
and
www.brookes.ac.uk/schools/planning/LTRC/outputs/EETP-html/EETP27.htm
[accessed December 2007].

Relevant references

Deakin, M., (2004). Valuing the link between research and teaching: making the connection worthwhile. *CEBE Newsupdate*. **9**, pp.22–24

Deakin, M., (2006). Research-led teaching: a review of two initiatives in valuing the link between teaching and research, *Journal for Education in the Built Environment*. **1**(1), pp.73–93

Helping students make sense of qualitative data at postgraduate level

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Classification category

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

Context

- **Course title**: MSc HRM; PhD workshops
- **Level and trimester/year introduced**: Masters/Doctoral.

Graduate attributes developed

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

This three-hour workshop (can be extended to one day) is aimed at Masters and Doctoral-level students and focuses on learning some key techniques involved in thematically organising and analysing qualitative (textual) data.

It starts with group discussion about the key characteristics of qualitative research and the variety of research positions that can underpin these. Followed by tutor input about the broad phases involved in qualitative analysis, case studies are drawn from the tutor's own research to describe and explain typical coding procedures and the more specific protocols of template analysis (King, 2004). Students are then provided with background information to a recent study looking at the nature and implications of changes taking place in human resource management (HR) functions within large UK organisations. They are then given a two-page excerpt from one interview transcript, asked to read this, jotting down interesting issues/themes, and to discuss these in pairs then attempt to put together an initial template. This exercise centres round pulling out interesting issues and prioritising themes, judging what are higher-order (foreground) themes

or sub-themes (background) and labelling of these into codes. The template is then placed on a flip chart and students asked to justify this to the class, reflecting on how they arrived at the themes and the classification of these.

A second transcript is provided, and this time students are asked to apply their template to the narrative, and to reflect on the problems and issues they face in doing so and the processes involved in modifying and applying templates. They learn that this is not a routine exercise – some codes are created and used at the start, others follow. It means inserting new themes, deleting unwanted ones, changing scope of themes and changing high-order classification of themes.

Reflective practice is treated as being core to the learning processes involved, and a plenary session involves class discussion about how the processes involved in template analysis will vary depending upon the analyst's research position and students discuss what this means in regard to their own research project The session finishes by asking individuals to jot down the learning gained from the workshop and to answer the question 'What is your research position and how will this shape the kind of assertions you can make from your qualitative analysis?'

Things to look out for and tips

The tutor needs to talk through the background and findings of the study from which the transcripts are drawn in order to bring this 'alive', and to ground this in the students' own experiences in order to increase the relevance of the material with which they will be working. For example, the material used here draws on a study that explores the impact of increasingly business-oriented HR functions upon the importance given by senior managers to employee wellbeing at the workplace. Students are first asked to think about their experiences in dealing with Personnel/HR functions, before the tutor describes the case material.

Does it work?

Both peer review and student responses have been positive. In the past, I have spent more time talking through the process and used very short examples – the workshop described here allows for more explicit development of technical skills in data analysis which has been identified as an important training requirement for management researchers at postgraduate level. The ESRC Research Report outlines training needs for qualitative management research, Cassell *et al*. (2005).

What problems/issues have arisen?

Students who are more comfortable with quantitative methods can find it difficult coping with large unstructured texts and tempted to foreclose too early in their development of a template. They need to be reminded that the coding and write-up of qualitative research means a search for meaning/structure rather than a multiplicity of 'evidence'.

Details of support material/course work/assessment methods

- Handout that explains the context of the case examples
- Excerpts from two transcripts (2–3 pages long)
- Set of PowerPoint® slides
- Flip chart, paper and pens.

Relevant references

Crabtree, B. F., & Miller, W. L., (1999). Using codes and code manuals: a template organizing style of interpretation. **In** Crabtree, B. F., & Miller, W. L., (eds.) *Doing qualitative research*. 2nd edition. Newbury Park, California: Sage

King, N., (2004). Using templates in the qualitative analysis of text. **In** Cassell, C., & Symon, G., (eds.) *Essential guide to qualitative methods in organizational research*. London: Sage

Matthew, B. M., & Huberman, A. M., (1994). *Qualitative data analysis: an expanded source book*. London: Sage

Francis, H., (2006). A critical discourse perspective on managers' experiences of HRM, *Qualitative Research in Organizations and Management: an International Journal*. **1**(2), pp.65–82

Cassell, C., Buehring, A., Symon, G., Johnson, P., & Bishop, V., (2005) *Benchmarking good practice in qualitative management research*. Available in PDF format at www.esrcsocietytoday.ac.uk/ESRCInfoCentre/index.aspx [accessed December 2007].

Using relevant research data to get students interested in data analysis

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

Context

- **Course/unit/module title**: various; as part of any module where students are learning how to analyse data.
- **Course title**: Various eg statistics, data analysis.
- **Level and trimester/year introduced**: various; for example, for 3rd year sports and exercise science students, for MSc Business Management students, even for 1st year business students.

Graduate attributes developed

At undergraduate level:

- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills.

At Master's level:

- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

- This involves the use of relevant data sets, and accompanying experiment or survey design information, for students to use in practical classes or as assignments.

- The data has been gathered by the teacher as part of her research, or gathered by the lecturer's postgraduate students for their dissertations. In the latter case the appropriate permissions must be sought.

- All data must be anonymised to comply with the Data Protection Act.

- At lower levels, the teacher selects a series of research questions in which the students have to analyse the data to provide answers. The students have to decide which variables in the data will address the research questions and then analyse, and report on the results, appropriately.

- At higher levels, the teacher provides the students with the aim of the survey or experiment and requires the students to first write their own specific research questions to address this aim. They must then demonstrate how the research questions are answerable from data that has been gathered.

- The format that the data is presented to the student can vary, depending on the aims of the module. For instance, it can be useful to first provide the students with a sample of completed questionnaires from the research and get them to construct an appropriate spreadsheet or SPSS file in which to enter the data. Alternatively, the data can be provided already in electronic format, though not necessarily the one that is most useful for analysis or that students are used to so that students have to work out how to cope with the mismatch (this is best done in a team situation).

- Careful choice of data is needed so that the students involved:

    - are interested in the research and really want to know what the data is saying
    - have a good understanding of the background context so that they know whether the results being obtained make sense: in practice, the students often know more about the context than the teacher and interesting and inspiring discussions can arise about what the results mean
    - can see how they can transfer the techniques and skills gained to their own research.

- It is useful to leave in some problematic data rather than providing a 'cleaned' data set. The extent to which students are guided through the clean-up process will depend on the stage they are at. The students

can then experience some typical problems that can arise with real data in a controlled fashion.

- If possible, the actual researcher who gathered the data should talk to the students about the research before they embark on the assignment or practical classes – this increases motivation and bonding with the data.

- If the data set is used for practical classes rather than an assignment, it is best, if possible, to stick to the same data set for several weeks, addressing several different statistical techniques. This isn't always possible, and a different data set may be needed for some topics.

- Data from a different research project can be provided for analysis in an assignment following the use of the research data in classes. Students often have initial difficulty transferring what they have learned from analysing one set of data to another if the questionnaire or experiment is very different. Supporting this skill transfer can reap great rewards when the students, later in their programmes, have to analyse their own research data.

- Extracts from any journal article or dissertation report on the data can help inspire the students.

Things to look out for and tips

Keep an eye out for data sets that could be useful whenever you help a student, colleague or external agency with some research and remember to ask them if you could use their data with other students. They don't have to be large sets: small pieces of action research that you do with a set of students one year can be very interesting to their successors the next year, provided no one can be identified from the data. Gathering a good store of different data sets is invaluable.

Does it work?

Students are very positive about the experience. Their eyes can light up as the researcher talks to them about the project and commitment to the analysis exercises is greatly enhanced.

Students get really interested in finding out what the data is saying, as they know it is 'real', relevant, and up-to-date knowledge. The evidence is only by observation but is consistent over many classes and years of students.

The transition from straightforward data that students normally meet in class to the messy complicated data they often meet in real life, can be very difficult, and this controlled situation can be invaluable training for handling their own research data.

What problems/issues have arisen?

Teachers may find themselves receiving emails from past students, now scattered all over the world, who start doing some research for their employer and want some advice. This is usually a pleasure and not a problem, so long as it doesn't get out of hand!

Areas to be developed/enhanced

Consolidating the learning (apart from the statistical learning) that students are gaining by providing a reflective exercise at the end that will require students to articulate things to be considered when analysing a real data set.

Enhancing student engagement through inclusion of topical research in face-to-face teaching

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: Creative Engineering; Engineering Applications (Mech); Renewable Energy and Sustainability; Honours projects
- **Course title**: B.Eng Mechanical Engineering; B.Eng Engineering with Management; B.Eng Energy and Environmental Engineering
- **Level and trimester/year introduced**: Creative Engineering – SCQF level 7, trimester 1 (all 1st years)
  Engineering Applications (Mech), Renewable Energy and Sustainability – SCQF level 9, trimester 1 (~30)
  Honours projects SCQF level 10, trimesters 1 and 2 (numbers variable, but approximately 8 per year).

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge

- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

I believe that it is possible to develop all of the above attributes through embedding research in one's teaching and this is done to a greater or lesser extent throughout all modules. A number of the attributes given above are more likely to be developed by certain students during their Honours projects.

At level 7, when knowledge of concepts and principles are low, my focus is reference to examples of applications in order to engage students in the subject area and to encourage reflection on the value of experimental work and stimulate creative thinking. For example, I have used work done on solar air heaters and pebble beds in greenhouses to support and complement mathematical calculations relating to energy applications and to illustrate the real-life issue of using technology to assist with the problem of a short growing season. I also aim to use and reinforce what is learnt in the Professional Skills module within my Engineering Applications teaching by asking students to find and evaluate relevant background materials for their reports and to cite such sources properly.

At level 9 more in-depth technical research work is required for the Group Assignment module, with the additional challenge of team working.

My teaching in later years of programmes is informed by on-going research work, and five out of eight Honours projects I have supervised this year have been related to my research.

At all levels, I believe that my own enthusiasm for my subject naturally leads to sharing what I have learnt through research within my teaching, and is a key element of inspiring students to learn.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

I am involved only at a peripheral level with MSc students but believe that for able students, embedding research in teaching and in projects proposed and/or undertaken can develop these attributes.

What does the researcher/teacher do?

In short, at risk of sounding somewhat pompous, my primary aim is to try and inspire and engage. Perhaps I am fortunate in that the majority of my students are enthusiastic about their subject area and that in the rapidly growing field of renewable energy there are an increasing number of new developments in technology and practice. My own research is primarily aimed at renewables applications at higher latitudes (ie Scotland) making it of immediate relevance to the majority of our home/EU students. I am therefore able to draw on case studies from my own recent work, for example two of my papers from earlier this year – 'Modelling the outlet temperature of a PV-driven solar air heater' (Grassie, 2007a) and 'Predicted annual thermal output of a PV-driven transpired plate solar air heater' (Grassie, 2007b) and from those of others in Napier and elsewhere, to enhance content and relevance of teaching material. The above mentioned papers show direct relevance of applications for energy efficiency and implementation for Europe. Additional papers with colleagues include Henderson *et al.* (2004) 'Estimating the performance of a PV-driven fan in a solar air heating system' and are again of direct relevance to core course material.

The receipt of a DTI SMART award has led to the development of a now commercially available novel solar water heater design (Solar Twin).

I also use visits based around real applications. For example, every year I take a group of students on a Solar Masterclass Weekend in conjunction with environmental science staff and students from Glasgow Caledonian University and architectural technology staff and students from the Mackintosh School of Art. In this multi-disciplinary environment students evaluate practical scenarios and consider how their knowledge, including that of current research, may be successfully applied. This venture is supported by the Scottish Solar Energy Group (www.sseg.org.uk/ [accessed December 2007]).

Things to look out for and tips

- Keep it relevant, ie appropriate for the module/programme and for the level of student.
- Maintain an awareness of what is being taught in other modules and aim, where possible, for continuity of approach.
- Aim to have a progressive approach to using research to support teaching, from promoting interest and engagement in early years, to supporting increasing technical depth and creativity more latterly.

Does it work?

Students seem better engaged, able to talk in depth about current issues etc. Module questionnaires reflect an appreciation of the relevance of the teaching to the real world.

What problems/issues have arisen?

It can be too biased to a particular area, and must maintain a balance in order to cover all module material. However, flexibility in delivery and a willingness to respond to the questions and developing interests of students is important and I believe that it is also valued by learners. There is a need to give relevant background to research so its context is properly understood.

Areas to be developed/enhanced

More visits and demonstrations of new techniques and equipment that have resulted directly from research would further enhance the embedding of research in teaching.

Details of support material/course work/assessment methods

Course work based on case studies from research and consultancy.

Relevant references

I have no pedagogical papers published on this subject. However, the list below gives an indication of the areas of research that I am currently involved in. These are of relevance across all levels of teaching in providing case studies and examples of relevant application of pertinent theory and practice.

This text, a case study/worked example approach to teaching, reflecting recent research in key heat transfer areas, is used extensively with 4th year students:
Muneer, T., Kubie, J., & Grassie, T., (2003). *Heat transfer, a problem solving approach*. London: Taylor & Francis

Conference papers

Grassie, T., (2007a). Modelling the outlet temperature of a PV-driven solar air heater. **In** conference proceedings Solaris 2007, New Delhi, India, February 2007

Grassie, T., (2007b). Predicted annual thermal output of a PV-driven transpired plate solar air heater. **In** conference proceedings Solaris 2007, New Delhi, India, February 2007

Grassie, T., (2006). Performance and modelling of a PV-driven transpired solar air heater. **In** conference proceedings Eurosun 2006, Glasgow, June 2006

MacGregor, K., & Grassie, T., (2006). A comparison of EU capital cities for suitability for solar space heating. **In** conference proceedings Eurosun 2006, Glasgow, June 2006

Odeh, N., Henderson, D., Grassie, T., & Muneer, T., (2005). A new method for estimating the optimum motor constant for PV-driven systems. **In** conference proceedings NorthSun 2005, June 2005

Odeh, N., Grassie, T., Henderson, D., & Muneer, T., (2005). Comparative testing of PV-driven roof slate-based solar ventilation air preheating systems. **In** conference proceedings NorthSun 2005, June 2005

Grassie, T., Odeh, N., Henderson, D., & Muneer, T., (2004). Slope irradiance modelling for Scotland. **In** conference proceedings Eurosun 2004, Germany, June 2004

Henderson, D., Odeh, N., Muneer, T., & Grassie, T., (2004). Estimating the performance of a PV-driven fan in a solar air heating system. **In** conference proceedings Eurosun 2004, Germany, June 2004

Honours students and the research literature: means of motivating engagement through the integration of private study, tutorial and assessment activities

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

4. Using assignments which involve elements of research processes, specifically literature reviews, presenting at a conference, participating in a panel session at a conference.

Context

- **Programmes**: Information Systems; Information Systems (E-business); Information Systems (Management); Information Systems (Security) Business Information Systems; Estate Management with Computing; Human Computer Systems; Information Technology Management; Quantity Surveying with Computing
- **Module title**: Knowledge Management in Business Organisations, CO42029
- **Level and trimester/year introduced**: level: 4, trimester 1 2004/05.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills.

What does the researcher/teacher do?

Given that, in general, individuals are motivated to act when it is easy to do, and the usefulness of acting is obvious (Hall, 2001), it is not surprising that strategic students take calculated short cuts in their studies. One common approach is to rely heavily on mediated module content such as lecture overheads rather than to study the research literature in the original. Whilst this approach can give an overview of the current thinking in a domain of study, active engagement with the primary source material – especially at Honours level – provides greater opportunities for critical evaluation of the work undertaken, as well as the development of theory in the domain.

In recognition of the difficulties in motivating final-year undergraduates to read the research literature in the original, in 2004/05 changes were made to the private study, tutorial and assessment tasks for the School of Computing's final year Knowledge Management module. The goal was tight integration of private study reading exercises focused on a set of papers with (a) advanced follow-up group activities in class, (b) group assessment, (c) individual assessment, and (d) a panel session with industry experts in week 12. The intention was that this would encourage deep student engagement in the research literature of the domain. The new approach, as outlined in detail below, has proved to be very successful in meeting this aim.

The first task for module tutors who wish to adopt this approach is to put together the journal articles, conference papers and book chapters that comprise the reading set to match the subject content of the module. A range of material should be selected: from established domain 'classics', to recent conference contributions considered to be at the forefront of the discipline. It is also important to provide variety in the type of material presented so that students have the opportunity to appreciate that published research literature takes many forms, including, for example, conventional reports of the findings of empirical studies, literature reviews, and detailed case studies of single organisations. Experience over the past three years has shown that students prefer to study no more than two papers in depth per week. Therefore recently the set of readings has been organised so that students are aware of which papers are *core* to the module programme and *must* be prepared in advance of the weekly tutorial, and those which are included for 'advanced study' purposes. Students who have a particular interest in the subject area, perhaps because the theme relates to their dissertation topic, are the most likely to follow up the 'advanced study' option. (The additional readings also give a choice of focus in the individual course work assessment, discussed in greater detail below.) For the module discussed here a minimum of eight articles is required for the eight 'regular' tutorials. In its most recent format, the students were actually required to engage with at least ten papers.

The module programme is designed in tandem with paper selection to ensure that the weekly lecture themes, tutorial exercises and reading exercises tie together neatly (and, of course, match with the learning

outcomes of the module). For most weeks that the module runs, the module team members are committed to designing two exercises – one for the individual private study task based around the reading, and a second more advanced group exercise to be completed in class – as well as writing and presenting a lecture. It should also be noted that running the class as a single three-hour block split between the lecture (1 hour) and the tutorial (2 hours) once a week has proved to be the most effective form of class delivery. Table 1 below shows how the module content was integrated in 2006/07.

Table 1 Integration of module themes with reading and tutorial exercises

Week	Reading exercise to be completed *before* the lecture	Lecture theme	Tutorial activities related to reading
1	None	Introduction to the module, including a presentation on managing research literature at this level	(None: ice-breaker exercises including juggling)
2	Literature review journal article on knowledge sharing	Knowledge sharing	Reading questions reviewed in groups; case study exercise on knowledge sharing
3	'Classic' journal article on knowledge networking	Knowledge networking	Reading questions reviewed in groups; guidance on course work 1 – concept mapping exercise based on the content of the article on knowledge networking
4	Conference paper on empirical research; case study article from the popular business press also based on empirical research	Online communities and innovation	Reading questions reviewed in groups; review of corporate material produced to encourage community work and innovation at Oracle
5	'Classic' journal article on social capital	Social capital	Reading questions reviewed in groups; exercise on social capital
6	Three hours' class time devoted to individual tutorials for students to discuss their individual KM concept maps with tutor		

7	Two theoretical journal articles on knowledge asset mapping and tacit knowledge	Knowledge asset mapping and tacit knowledge	Reading questions reviewed in groups; assessed tutorial work – consolidated concept maps created as a group activity
8	Journal paper on empirical research	KM and strategy	Reading questions reviewed in groups; guidance on course work 2 – exercise on structuring the report content
9	No formal classes – School of Computing Reading Week		
10	Literature review article on intellectual capital	Intellectual capital	Reading questions reviewed in groups; case study exercise on intellectual capital
11	Theoretical article on discourses of KM	Discourses of KM	Reading questions reviewed in groups; exercise on discourses of KM
12	Panel session with invited industry experts		

The next step in completing the processes of embedding the research literature within the module is to write the assignment specifications. There are three forms of course work assessment for the module. (There is also a conventional exam in week 14 or 15.) The first course work assignment (worth 30%) requires the students to work together in groups to create concept maps of knowledge management themes encountered in the first five weeks of the trimester. This is achieved in tutorial time in week 7. Individual entitlement to take part in this assessment is dependent on the formal submission of an individual concept map on the day before the group activity takes place. As well as ensuring that all team members start the group assessment prepared to contribute, the tutors use the individual submissions to determine group composition for the following day's assessed exercise.

The output produced for the group task in week 7 shows that the students have a genuine knowledge of the concepts encountered in the module to date, largely on the basis of reading the research literature in the original. They are able to relate the content of the set reading material to the main module themes, articulated in the largely graphic form of the concept map, and also verbally in the presentation of a rationale for the concept map's form. This level of achievement is largely due to the careful structuring of the module: by the time the group work is assessed the students have

considered each of the set readings for at least six separate activities, as shown in Table 2 below.

The details of this first assessment task are made public at the start of the module. In contrast, the requirements for the individual task (worth 50%) are released after the group work is completed. This individual assignment requires the students to select three of the papers encountered in the second half of the module to analyse in depth in a written report. Here the students are expected to evaluate each of the three papers separately, first by summarising their main arguments, and then by judging each paper's quality with reference to criteria such as authority and accessibility. Then the students are required to consider the three papers selected together. First the papers are compared and contrasted as a set, and in the last section of the report they are related to the module content as a whole, taking into account the rest of the papers studied in the module to date. Again, at the point that the students complete the work for submission, they are very familiar with the three texts to be discussed: they have already considered the reading in five separate activities, as shown in Table 2 below. The requirement to relate the three papers to the wider module content as a whole makes obvious the value of engagement with all the papers covered throughout the course of the module, whether or not they are examined in depth for the individual course work submission. A further benefit of this approach is that the work towards this major component of the course work assessment is completed over the full twelve weeks of the module. This eradicates some of the problems associated with assignments completed as rush jobs chasing a tight deadline, such as under-developed, incomplete, or plagiarised content.

Table 2 Building familiarity with the reading material

Week	Engagement with each paper	Applies to the preparation of the group assessment work?	Applies to the preparation of the individual assessment work?
1	In private – reading paper(s) in private study time, making notes guided by reading exercise questions	Yes	Yes
2	With student colleagues – discussing responses to the private study exercise questions in teams in class in the first part of each week's tutorial	Yes	Yes
3	With student colleagues – applying what has been learnt in a team exercise completed in the second part of the weekly tutorial (eg analysis of a case study with reference to the theory covered	Yes	Yes

	in the paper prepared ahead of class)		
4	In private – preparation of draft assessment work	Yes	Yes
5	With a tutor – by discussing draft work and then acting on feedback given for the preparation of the individual submissions	Yes (week 6)	Yes (week 11)
6	With colleagues – by discussing and presenting work	Yes, with other students and tutors in the construction of group concept maps (week 7)	Yes, with other students, tutors and industry experts in the panel session (week 12)

The third element of course work assessment for this module is class participation (worth 20%). Although attendance in class is relevant here – it is difficult for students to participate if they are not in attendance – in this context 'class participation' is understood as *active engagement* in the class activities. At the most basic level this means that students must come to class prepared to discuss the private study exercise in teams, and able to apply the knowledge gained from the private study exercise to the specifics of the tutorial exercise. The implication, of course, is that to gain reward for class participation, students are obliged to have completed the private study work prior to the weekly tutorial. As is the case for the group and individual assessments, the value of completing the reading to pick up marks for this course work element is obvious. It is also worth noting that peer pressure plays a role here: less motivated students soon learn that if everyone else is putting effort into preparing for class, then so should they.

There is a particular focus on class participation in week 12 when the panel session with industry experts takes place. Here all students are expected to take part in the academic debate, either as a presenter on the subject of one of the papers covered for the individual assignment task, or as a 'supporter' of a presenter. In practice the tutors select the presenters on the basis of the content of the individual course work submissions and of their knowledge of the students. They partner the presenters with other students who have considered the same papers in their course work submissions. Each 5–10 minute presentation, chaired by one of three industry experts, is followed by discussion by class members. The supporter role is to help the presenters prepare prior to the session, and to play an active role in the discussion that follows. Once again, familiarity with the research literature is important for this activity, and has been achieved through the integration of module components.

This panel session in week 12 is the high point of the module. By this stage it is evident that the students have gained from the papers an appreciation of how research is conceptualised, designed and implemented, and are aware of how findings are disseminated in the broader research community. Through the requirement to regard the set readings as a whole, the students understand how new knowledge relates back to established work, and the role that networks of research themes, and of influence, play in domain growth. The attention paid to analysing and evaluating the research literature, as well as the means of doing so, gives the students the confidence to be critical in their assessment of other work encountered in the course of their studies, not least the material that they need to identify and critique for the literature review chapters of their final year dissertations. In addition, this practice makes them more aware of the requirements of high-level research literature, and helps them in their self-appraisal of their own efforts at academic writing.

The impact of this approach includes high levels of class participation, student satisfaction and achievement, as evidenced in excellent attendance, complimentary comments on module feedback forms, and good assessment results: last year, with the exception of two students who had mitigating circumstances, all students passed both the exam and course work assessments at first attempt. Fundamental to this is student motivation encouraged by two clear messages. First is the recognition that it is easy to follow the recipe for success: in short, *complete the reading exercises and turn up to classes*. Second, by week 2 it is clear that the strategy merits adoption when it is realised that unless the private study reading exercises are completed, it will not be possible for individuals to remain in the class after the lecture to join in the main tutorial activities. Added to this is the peer pressure to contribute, and the knowledge that all three components of the course work assessment depend on intimate knowledge of the set reading. This is an approach that can be implemented in other modules – regardless of subject domain – where there is a drive to motivating students to immerse themselves in the research literature.

Things to look out for and tips

- Add to the file of master copies of potential material for the reading set as you come across articles and papers throughout the academic year. Equally, keep an eye out for interesting panel session members.
- Since the course work assessment tasks remain largely unchanged from year to year, it is important to ensure that some changes are made to the reading set for each presentation. (If not, there is a danger of students from the current cohort being tempted to plagiarise the work of students from previous years.)
- A degree of imagination is required to ensure that the means by which the eight ‘regular’ tutorials are facilitated is varied, and that the membership of the teams changed from week to week so that all class members have a chance to get to work together, to know one another

and build trust. This is particularly important for the panel session when the presenting students will be relying on assigned 'supporters' to participate as audience members and help progress discussion.

- If possible book a special room, such as a boardroom or conference facilities, for the panel session.
- You have to be very well-organised in the weeks when the assessed work is due for submission so that you have time to look at the work submitted and get students into groups for the concept map task, and identify presenters and supporters for the panel session.

Does it work?

Student comment made on feedback forms for this module is always very positive. Many compliments are paid to the quality of the teaching, the module content and its delivery, the output of the learning activities, the highly participative nature of the class activities, the applicability of skills learnt to this module and other areas of study, and assessment strategies. One student last year wrote on the evaluation form *I just like everything about [the module]*. The following quotations are of particular relevance to the presentation of the case study in this document:

- **On learning**: *This is a module where I feel like I have been able to achieve a great deal…I feel that I have developed a 'deep' understanding of the topic and this is very satisfying* (2005/06); *It is an interesting module that has provided me with new information and techniques that help in managing lots of things to do with knowledge management* (2006/07).
- **On motivation to engage, and the impact of engagement**: *You are actually made to do work…As a result I feel confident about passing the module* (2005/06); *Having tasks set for each week forces me to study* (2006/07).
- **On the participative nature of the module**: *Class participation helps with understanding of difficult topics* (2006/07); *[Group work in class] is valuable, occasionally very entertaining, and worthwhile to have the experience because this is how work is often done in industry* (2006/07).

Feedback from the industry experts has also been very favourable. In short, the guests are very impressed at the level of debate exhibited at the panel session amongst a set of students who knew nothing of the research papers under discussion three months earlier.

What problems/issues have arisen?

Some student feedback includes comment on the quantity of reading that the class members are expected to complete. However, these are tempered with phrases showing recognition of the value of the approach, eg *Although it's a pain to read one or two papers per week, it's beneficial in the long run*

(2005/06), and a number of students write that they would like to consider some of the topics covered in greater depth. Another issue is that the module is taken by students from across the discipline of computing. Some of the students on the more technical degree programmes occasionally question the relevance of taking this non-technical subject as a core module.

Areas to be developed/enhanced

Amongst the areas to be developed in the near future (of relevance to the aspects of the module covered in this case study), next year the intention is to:

- Use more papers that include case studies, particularly in technical environments for the sake of maintaining the engagement of the more technical students.
- Focus some of the study skills time on advanced writing skills such as means to relaying personal interpretation in the individual course work reports whilst maintaining an objective stance, and how to focus the reading of academic papers (ie not read every word unless this is absolutely necessary).

Details of support material/course work/assessment methods

URL for module as delivered in 2005/06: www.soc.napier.ac.uk/module/op/onemodule/moduleid/CO42029 [accessed December 2007].

Relevant references

Hall, H., (2001). Input-friendliness: motivating knowledge-sharing across intranets, *Journal of Information Science*. **27**(3) pp.139–146 (DOI 10.1177/016555150102700303)

Using research to teach qualitative research

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Classification category

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: PS22026 Qualitative Research in Practice
- **Course title**: BA Social Science; BA Psychology & Sociology (Sociology Major)
- **Level and trimester/year introduced**: level 8, trimester 2, 2006/07.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

What does the researcher/teacher do?

Background

The development of the Qualitative Research in Practice module arose from an identified gap in students' knowledge of, and practice in, qualitative research. Previously qualitative research was taught through two research modules. In the year 2 module, methods of data collection in social science research were explored with a small amount of time given to qualitative interviewing. In year 3, students concentrated on social science data

analysis, both quantitative and qualitative. However, it was apparent in this module that the students had not acquired a grounding in the basics of qualitative research, making qualitative data analysis very difficult for them to undertake. To address this situation, two new 2nd year modules were created to replace the year 2 and 3 modules. One would focus on quantitative research and the other on qualitative research.

The new module, Qualitative Research in Practice, takes students through the stages of the research process: developing a research question, designing qualitative research, looking specifically at qualitative interviews; analysing qualitative data; evaluating qualitative research; writing convincing arguments from qualitative data.

The aims of the module are:

- To develop students' critical thinking on key issues in qualitative research
- To provide students with first-hand experience of qualitative research.

LTA strategy
The module revolves around the module leader's research on parent/child negotiations around risk and safety, to guide students through the research process. The project serves two functions:

1. As a case study to illustrate and provide examples of the issues being discussed. The project allows abstract research theory to be grounded in real examples.
2. 'Real' data from the project are used to give the students first-hand experience in data analysis.

In the first half of the module students attend six one-hour lectures (weeks 1–6) introducing them to key issues and approaches in qualitative research. Practical experience is gained in weekly two-hour workshops. In these classes students are expected to participate actively in small groups, learning from their peers' and tutor's experiences, and building their knowledge on a weekly basis.

This can be illustrated with reference to one of the topics studied – qualitative interview design. There is discussion in the lecture around the purpose of the interview and the impact this has on interview design; reference is made to relevant sections of their textbook outlining types of questioning and other techniques to be used within interviews. These issues are then grounded in examples from the module leader's own research and students are given the topic guide used in that project. In the workshop students work in small groups through a step-by-step exercise to design a topic guide for a fictitious project on student retention. After the workshop, they prepare their own topic guide to be used in their first assessment. The

following week they bring this to class, discuss with their peers and their tutor and reflect on the process.

This part of the module is assessed by a 2500 word report reflecting on the design and conduct of a small qualitative interview project. Students develop a research question; design a topic guide; and carry out three interviews. The report requires them to reflect on this experience and to situate those experiences in the methodological literature on interviewing.

The second half of the module concentrates on qualitative data analysis. Using a transcript from the module leader's research, students are taken through the stages of interpretive thematic analysis. Each week students work together in small groups, analysing the transcript. By working with the same transcript, students are able to share ideas and simulate the experience of the workings of a real research team. This work builds each week and students can draw on these experiences in writing their second piece of assessment. In a 2500 word report students present and discuss a reflexive account of the process of qualitative data analysis.

Things to look out for and tips

It is important to ensure that the project used is on a subject/topic that the students can all engage with. It is very important to reinforce the importance of attendance to students in this practical module focused on experiential learning and perhaps to find a way of linking attendance directly with assessment. This link was implicit in the module – in the workshops students were working on their coursework so there was an obvious benefit to being there.

Does it work?

This module ran for the first time this trimester so it is not possible to comment on its impact in students' research work in later years. Students were asked to reflect on their experience with qualitative research in both pieces of assessment and many commented on how interesting it was but also that it was more challenging than they had expected. Many students are often concerned about quantitative research methods and regard qualitative research as an easier option. This module provides students with a more realistic picture of the qualitative research process.

What problems/issues have arisen?

The biggest issue this trimester has been attendance. Despite being informed of the need to attend, attendance was very poor, limiting both their own learning experience and that of the students who did attend.

Areas to be developed/enhanced

Next session I am going to ask students to keep a learning log and this will form part of their report submission. As part of this I will be encouraging students to use WebCT and will set up discussions at appropriate points in the module to facilitate the process of reflection. I would hope through this to encourage students to reflect on what they are learning but also to encourage attendance.

Details of support material/course work/assessment methods

A Module Handbook is available from Jeni Harden.

Developing practical research skills in emergent computing

Dr. Emma Hart, School of Computing
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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

Context

- **Course/unit/module title**: Emergent Computing for Optimisation
- **Course title**: Advanced Software Engineering
- **Level and trimester/year introduced**: MSc, trimester 2.

Graduate attributes developed

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

The module content is based around the practical application of current research topics in Emergent Computing and is delivered by the Director and Deputy Director of the Centre for Emergent Computing.

A number of practices are adopted during the module in order to develop student appreciation of research in the discipline and to simulate research processes. The first practice concerns the use of student-led seminars in order to introduce students to relevant concepts through the use of state-of-the-art research in the field. A lecture slot of one hour is first used to present basic concepts and theories from a particular topic, and hence provide a foundation for the students to build on – the remainder of the topic is taught through the seminar. The students are given a relevant recent conference or journal paper to read during the week following the introductory lecture,

which is accompanied by a list of open-ended questions. The students are asked to make short notes for each question. At the seminar, the students divide into groups (assigned by the lecturer, and changing each week) and discuss one of the questions for approximately half an hour, pooling their individual ideas. Following this, each group nominates a speaker, who then presents the group's findings and ideas to the rest of the class. The lecturer provides input as necessary to guide the discussion and to ensure that the essential points are covered. Students in the audience can contribute further questions. As a result of this process, each student engages with all sections of the paper at a detailed level, either through listening or participating. Furthermore, each student receives a more rounded view of the topic as a whole, by engaging with the views of their peers. All topics covered in seminars are ultimately examinable in the final examination, hence the material is essential reading for the students. The lecturer also ensures that each student takes a turn at participating in the presentations during the course of the module.

The second practice concerns the continuous assessment element of the module. Students are asked to conduct an original piece of experimental research, and write up the results in the form of a (short) conference paper. Typically, students are given a set of problems to solve and a naïve algorithm which is able to make some attempt at solving the problem. The students are then asked to modify the algorithm in any way they wish, incorporating one or many of the techniques they have been taught during the course, in order to improve the performance of the algorithm on the problems supplied. On completion of the assessment, a competition is held to determine which student has the best performing algorithm. The scope of the assessment is deliberately wide – weak students may make minor changes to the algorithm, whereas good students often find novel methods for solving the problem that go beyond the ideas introduced in the course. The students are given a number of weeks to experiment with their ideas before the competition is held. During the competition, a new, previously unseen set of problems is supplied to the students, and each student is given a fixed amount of time (usually one minute) to find answers to the problems using their new algorithm. Marks are awarded competitively depending on the quality of the solution. The remainder of the marks for the assessment are awarded based on the writing of a paper. This paper is in the style of a short conference paper, including an abstract, aims, experimental method, presenting results and describing conclusions, and has a strict page limit. Writing the paper tests the student's ability to present results and arguments clearly and concisely, and is an excellent introduction to the students in basic research (and particularly) experimental techniques.

In addition to the above, the lecture programme of the module is directly linked to our research. Each year one or two guest case study lectures are given by internal researchers in the field. These might be research-active staff who are involved in a particular project, or a senior PhD student who can talk about their thesis. The students are also encouraged to attend and

interact in Research Centre seminars given by invited external speakers. This gives the students the opportunity to hear about the very latest research areas, and to make comments and suggestions to researchers for further work. Being able to input their own ideas into the research process, and having those ideas taken seriously, is very valuable as a confidence building activity.

Things to look out for and tips

For the seminars, it is essential to select suitable papers, which introduce only one or two ideas and do not rely on a very detailed knowledge of the area. Guest lecturers needs to be chosen carefully to ensure that they are excellent communicators and will treat the students as less experienced equals.

Does it work?

Comments regarding the coursework, in particular the competition element are very positive. The students enjoy the challenge of competing against their peers.

What problems/issues have arisen?

Problems can arise in seminars when students do not adequately prepare by reading the material before the seminar, and therefore are unable to play a full part in the discussion.

Areas to be developed/enhanced

The seminar idea may be further developed so that each student is asked to lead a complete seminar on a particular topic of their choice, having been given a number of weeks to prepare beforehand.

The School of Life Sciences Project Module

Dr. Mark Huxham, School of Life Sciences
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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

Context

- **Course/unit/module title**: Research Project
- **Course title**: all Biological Sciences routes
- **Level and trimester/year introduced**: Honours year, trimester 2.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments

- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

What does the researcher/teacher do?

Background
The School of Life Sciences has run an Honours level research project module for many years. This is common in many universities in biology, but our module has a number of features that distinguish it:

1. **Size** – the module is worth 60 credits, contributing one third of the Honours degree marks, and runs for the whole of trimester 2 in the final year. The students can thus focus entirely on their research, without the distraction of other exams, and have sufficient time to conduct a significant piece of work.
2. **Choice** – students are offered a wide range of potential topics for research from which to choose. They are also encouraged to suggest their own research topics and ideas and to discuss these with appropriate potential supervisors.
3. **Verisimilitude** – because the project is such an important part of their degree, and students commit significant time and effort, the resulting research is often of a high standard. This is demonstrated by the frequency with which student projects are published in peer-reviewed journals.

Process
A list of potential project titles is compiled by supervisors and offered at the start of the academic year to all students studying one of the nine biological sciences degree routes. Students arrange to meet with potential supervisors to discuss their preferred research topics (which may include their own suggestions), and confirm a provisional project title and supervisor by the middle of trimester 1. The first three weeks of trimester 2 (after completing assessments for all theory modules) are spent producing a project proposal, which includes a literature review, methodology and timeline. Students then conduct their research over the next ten weeks or so. Projects may be done in Napier laboratories or outside (in collaborating universities and institutes), in the field (in Scotland or abroad) or using social science methods (such as questionnaires). The defining feature of all the projects is that they must involve the collection and analysis of original data – no projects are merely literature based. Students meet regularly with their supervisors to discuss progress, and are encouraged to submit draft versions for constructive feedback. Most projects involve discussion of and training in health and safety and relevant ethical issues. The final theses are marked by the supervisor and another internal marker, along with an external examiner. A range of relevant criteria are used for judging projects, including the scope and relevance of the literature review, the use of appropriate research methods and statistical analyses and the level of critical evaluation of the

students' own work and of relevant previous papers. In addition, 10% of marks are awarded for the students' 'effort' as assessed by the supervisor or external mentor (this component of the marking scheme allows students to benefit from good work in the laboratory or field even if the final results suffered from unforeseen and unavoidable problems).

Outcomes and benefits for students

Because the project module involves students participating in real research, the full range of benefits and attributes associated with conducting one's own research are relevant here. But of particular relevance for our students are the following:

1. Discovering aptitudes and interests. For many students the research project is the springboard for their future career; this often reflects interests that they discovered during the project. For example, the research described in Huxham *et al.* (2006a) on primary children's attitudes to wildlife stimulated one of the authors to find a career working in environmental education.
2. Demonstrating research abilities to employers. Many potential employers for biologists are looking for people with competent research skills. Having a published paper on your CV is one of the best ways of doing this. For example, the research described in Huxham *et al.* (2006b) helped one of the authors obtain work with the Scottish Environmental Protection Agency.
3. A gateway to further research. Many of our students progress to PhD or Masters courses, often because they discover they enjoy research and want to continue looking at the topics they studied as Honours students. For example, research described by Huxham *et al.* (2004) was the stimulus for one author to enrol on a PhD in a similar area.

Things to look out for and tips

Don't underestimate the effort involved. Students need lots of one-to-one support and guidance when doing research.

Does it work?

Most of our students report that the project is the most important and enjoyable part of their degree. The external examiners consider it as the jewel in our crown. Employers often recruit our graduates on the basis of the research experience they have had.

What problems/issues have arisen?

Distribution of workload: some topics and supervisors are more popular than others. If students are allowed completely free choice this might imply some supervisors having many more students to manage than others.

Comments on drafts: because the number of drafts submitted, and the detail of feedback provided, can differ between students and supervisors, there is the potential for inequity.

Areas to be developed/enhanced

Although formative feedback is an essential part of the process, we probably need clearer guidelines on how to manage differences between tutors on the amounts of feedback different students receive.

Relevant references

Huxham, M., Welsh, A., Berry, A., & Templeton S., (2006a). Factors influencing primary school children's knowledge of wildlife, *Journal of Biological Education*. **41**, pp.1–4

Huxham, M., Gilpin, L., Mocogni, M., & Harper, S., (2006b). Microalgae, macrofauna and sediment stability: an experimental test of a reciprocal relationship, *Marine Ecology Progress Series*. **310**, pp.55–63

Huxham, M., Kimani E., & Augley, J., (2004). Mangrove fish communities: a comparison of community structure between forested and cleared habitats, *Estuarine, Coastal and Shelf Science*. **60**, pp.637–647

Building research skills in postgraduate health and social care students

Dr. Catriona Kennedy, School of Nursing, Midwifery & Social Care
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Classification category

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

Context

- **Course/unit/module title**: Dissertation
- **Course title**: MSc Nursing and associated programmes
- **Level, and trimester/year introduced**: postgraduate after completion of research modules and normally at the end of studies.

Graduate attributes developed

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

The Master's Dissertation is an extended study of a topic appropriate to the pathway the student is undertaking. The purpose of the dissertation is to demonstrate the student's ability to collect evidence, argue coherently, evaluate critically and to synthesise the disparate information that they gather. They must also demonstrate the ability to work with appropriate theoretical methods. It may involve original research or the study of unpublished or primary material or it may be a systematic review of existing literature or research studies in such a way to gain new perspectives. However, it will demonstrate the student's ability to plan data collection and interpret and analyse the data collected. The quality of the dissertation depends on how well the overall theme or argument is constructed and

sustained, and the extent to which theory and data can be analysed and synthesised.

There is no content as such in the dissertation but the role of the supervisor is challenging and requires sophisticated skills in research and a thorough grasp of conceptual issues. The role of the dissertation supervisor is to guide and facilitate the student through the process of preparing for, conducting and writing up the research. The term 'supervision' is used to cover a number of learning and teaching activities including one-to-one tutorials, small group tutorials and comments on drafts.

The supervisor's role involves:

- Helping the student to determine that what they are planning to do is possible in the time available
- Agreeing a programme of work, including how to plan study time and monitor progress
- Agreeing a learning contract with the student
- Advising and encouraging the student throughout the process
- Helping the student to develop skills as a researcher
- Helping the student to understand the research approach they are taking
- Providing regular supervisory contact and emergency contact if needed
- Reading work and providing constructive feedback
- Providing feedback on progress in a way that the student can see how their work is progressing
- Advising on the standard of the work so that it conforms to University guidelines.

The Dissertation supervisor should:

- Be familiar with the University regulations regarding the Dissertation module
- Be familiar with all the materials in the dissertation guide
- Make the first contact with their allocated student in order to agree methods, frequency and times for communication
- Tell student if they are going to be away, or for any other reason will not be available for tutoring at times they have previously agreed
- Respond within 72 hours (working week) to any communications from the student
- Take action to investigate the reasons if the student fails to communicate with them at appropriate intervals, fails to keep appointments or fails to send work as agreed
- Assess and provide feedback on draft work normally within five working days of receipt
- Read draft work in advance of meetings
- Be available when needed by mutual agreement
- Be friendly, open, supportive and challenging
- Be constructively critical.

- Have sufficient interest in the student's research to put more information such as reading, resources and contacts their way.

Agreeing a contract

The first meeting between supervisor and student should be seen as a process of negotiation for the whole period of the Dissertation work and by the end of this meeting each should know what the expectations are, the dates of meetings and the timing of drafts in time to complete the submitted work. Establishing the best way to communicate is essential.

Things to look out for and tips

Involves preparation of supervisors.

Does it work?

We have a system of peer supervision for new supervisors.

Details of support material/course work/assessment methods

A Handbook is available from Catriona Kennedy.

Relevant references

Relevant references are contained in the Handbook.

Groovy in the curriculum

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Ken Barclay, School of Computing
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Dr. John Savage, School of Computing
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Classification Category

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: Scripting Languages; Parallel Architecture Patterns
- **Course title**: BEng Software Engineering; MSc Advanced Software Engineering
- **Level and trimester/year introduced**: undergraduate level 8; postgraduate level 11.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

During the past five years our scholarly activity has increasingly aligned itself with the Java open-source community. They represent software engineers that seek, through the community, solutions to current software engineering problems. The community is self-sustaining and publishes solutions, software frameworks and tools. In turn, the community enriches these developments for the benefit of all.

In the last three years our efforts have been directed at promoting Groovy[1], a dynamic language for the Java platform. An enduring debate in the academic community is the role of programming in the computing curriculum[2]. Programming courses invariably get locked into language syntax. This can detract from higher levels of understanding. Analysis, design and testing are all sacrificed to coding. As a result the importance of more general analysis and problem-solving skills are lost.

Groovy can make significant contributions to the curriculum. Less code bulk can make programming less intimidating. It engenders more confidence in students by producing working applications with minimum fuss and effort. Because Groovy seeks to remove much of the heavy lifting from Java code it can be used to enhance students' problem solving skills. Groovy operates at a higher level of abstraction and offers the opportunity to better explore important parts of the curriculum such as algorithms, data structures and parallel programming.

At undergraduate level, advantage is taken of the high signal-to-noise ratio of Groovy to promote problem solving. Through Groovy we seek to expose students to reformulate challenging problems into ones that are solvable through:

- modelling the relevant aspects of the problem to make it tractable
- transforming the model into an (unoptimised) implementation
- reification of the implementation into an efficient solution.

At postgraduate level Groovy has been used to simplify the programming of solutions to highly parallel problems, thereby enabling the students to concentrate on the underlying theory and principles. These principles are underpinned by a wealth of theory and good engineering practice, which the Java formulation obscures. Furthermore, they are able to reason about the performance and behaviour of their solution. The Groovy formulation clearly exposes the underlying analysis and design and hence its quality. A tutorial on the use of Groovy Parallel in the teaching environment[3] is to be presented to the primary conference in this area.

This use of Groovy has led to the creation of many projects at undergraduate, postgraduate and Doctoral level that are exploring the nature of parallel systems and their exploitation in new and exciting problem areas,

which are already being fed back into teaching at the postgraduate level. For example:

- students are being exposed to the concepts of mobility in modern computer systems and are building systems that rely on a mobile capability for their correct functioning
- one postgraduate student project is developing a graphical tool for the industry standard development environment, Eclipse, which permits the creation of parallel user interfaces and subsequently parallel systems
- another is developing a simulation of a modern multi-core processor for use in processing media streams in the next generation of hand-held mobile devices.

Thus we see that exposure to well-founded research concepts by means of an easy to assimilate teaching and learning environment is leading to further research and discovery in the application of these concepts.

Things to look out for and tips

Be enthusiastic! Decide when and if you intend migrating to pure Java.

Does it work?

Many students (about 50% of the undergraduate cohort) elect to study Groovy. This is reinforced by formal and informal feedback that indicates a strong preference for Groovy among the undergraduate and postgraduate student population.

The Groovy Open Source community intend (September 2007) broadcasting a podcast of and interview on ‘Groovy in the curriculum’.

There has been an enthusiastic response to Groovy[1] from the Open Source community.

What problems/issues have arisen?

It can be difficult to justify not teaching Java. Colleagues sometimes see Groovy as ‘yet another programming language’ and ask ‘Will it survive?’

Areas to be developed/enhanced

More teaching material.

Details of support material/course work/assessment methods

One book[1] is available and another is in preparation[2] (it is currently available in draft form). There are also two useful websites[4, 5]. Postgraduate teaching is supported by an innovative tutorial approach.

Relevant references

[1] Barclay, K., & Savage, J., (2007). *Groovy programming: an introduction for Java developers*. San Francisco: Elsevier (Morgan Kaufmann Publishers)

[2] Dehnadi, S., & Bornat, R., (2006). *The camel has two humps* (working title). Middlesex University: School of Computing

[3] Kerridge, J., (in preparation). *Groovy parallel: concurrent and parallel programming for Java developers*. San Francisco: Elsevier (Morgan Kaufmann Publishers)

[4] www.dcs.napier.ac.uk/~kab/groovy/groovy.html [accessed December 2007]

[5] groovy.codehaus.org/ [accessed December 2007]

Revenue management in visitor attractions

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: HT71021
- **Course title**: Heritage Tourism & Visitor Management taught on MSc International Tourism
- **Level and trimester/year introduced**: postgraduate, trimester 1.

Graduate attributes developed

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

This is an established area of research for the lecturer concerned with a variety of texts, journal articles and conference papers published on this topic. Therefore the research context is set clearly within the subject area. The key research project used relates to surveys of visitor attractions to determine the role of revenue management in their overall management of a site. This is based on the results from postal surveys to sites in Scotland, Australia, Canada and New Zealand.

The module aims to establish the key considerations and management involved in heritage sites internationally. It includes material on finance, supply and demand, visitor management and interpretation of resources. It is taught in one three-hour block with a one-hour lecture plus two-hour tutorials and makes considerable use of case studies to encourage learning and the

opportunity for students to put theory into practice in relation to individual sites. The assessment is based on an essay and a case study exam.

The Knowledge Transfer works via placing the theory of revenue management within the lecture, backed up by case study preparation on the students' part in the tutorial. Specific questions are asked in relation to the revenue management aspects – pricing techniques, ownership considerations, value for money, site management issues and so forth. Students prepare the questions in advance then class discussions are held for each area. Students are encouraged to access relevant journal articles in compiling their answers and in sourcing specific examples of their own choosing – from their own countries or Scotland. This all assists in preparation for the exam where one question will relate to how pricing and revenue management are/could be managed at the site in question.

It works because students are able to see real examples taken from the research, in terms of broad results plus site-specific examples, and are able to see how these are appropriate. They then have the opportunity to work out responses to situations at other real sites prior to preparing for the exam environment. It should also mean that they are aware of the range of options available to managers in a variety of contexts, should this be a part of a job they may undertake in the future. It combines both the practical and theoretical aspects of the subject and is set within the context of available publications to enable further research on the students' part. Research informs the teaching and the module content by identifying the key issues in managing heritage attractions and uses practice-based research to encourage students to make the link between theory and practice.

Things to look out for and tips

Ensure the relevance of the work is clear to get their interest – emphasise that this is a real task they might need to undertake.

Does it work?

Student feedback is positive and they can see the relevance of what they are learning via assessments in this and other modules, eg live projects based in attractions. Results are seen in viable solutions provided in the exam responses.

What problems/issues have arisen?

The results are from only four countries; it would be really helpful to have more from a broader range of countries to ensure relevance to the student body.

Areas to be developed/enhanced

The development of site-specific data and case studies in support.

Details of support material/course work/assessment methods

Not applicable as material is all prepared and delivered in a class setting by the module leader.

Relevant references

There are a range of articles relating to the subject here but none on the method – further information on this can be provided on request from Anna Leask.

Operations Management in practice

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: Operations Management (undergraduate) and Business Operations (postgraduate)
- **Course title**: various undergraduate courses and postgraduate MSc Business Management
- **Level and trimester/year introduced**: level 3 and level 7.

Graduate attributes developed

At undergraduate level:

- Informed by current developments in the subject
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

What does the researcher/teacher do?

The base from which the links are made is that of a NUBS knowledge transfer partnership (KTP) where staff work on a two-year project with an industrial organisation to improve the organisation's performance. This is done through the use of a bright graduate – called an 'associate' – who works on the project in the organisation under the supervision of the academic and company staff. The project is normally based on improvements that are at the leading edge of work in the subject area, in this case Operations Management.

The links to teaching are principally simply to use the work of the KTP for both undergraduate and postgraduate students to:

- illustrate the role and nature of operations management activities in a real-world commercial environment
- understand the processes by which a major operations management project is undertaken
- understand leading edge operations management developments and their use in improving the competitiveness of organisations.

The means by which this is done is to supplement the necessarily general and broadly applicable curriculum with short cases based on the KTP project and guest lectures from the associate and staff involved in the KTP. There isn't an assessment based round this. It is very well received by the students, especially postgraduates.

Things to look out for and tips

Don't be too complicated in terms of what you try to do but it is the real-world dimension that bring this to life.

Does it work?

Seems to be very well received by the students.

What problems/issues have arisen?

Only a limited number of such 'examples' can be used and some students would prefer these to come from other areas such as the service or public sector etc.

Use of authored textbooks in civil engineering courses

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

5. Giving students first-hand experience of research based knowledge transfer (whether commercial or pro-bono) (eg as an 'intern', as work-based learning, as a consultant assistant, or as a laboratory assistant).

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

Course/unit/module title:
Course title:
Level and trimester/year introduced:

My textbooks are used in all civil engineering related programmes at undergraduate level and at postgraduate level in the MSc Advanced Structural Steelwork Design module. They are used to varying degrees from 1st year to final year.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry

- Familiarity with advanced techniques and skills.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

I am the author of several textbooks (see Relevant references section below). All of these textbooks are widely used for both undergraduate and postgraduate studies varying from 1st year structural mechanics to final year structural analysis and design. In addition, they are used by practitioners in structural, architectural and building design offices throughout the UK and overseas.

Lectures are always incomplete, but comprehensive detail and arguments can be presented in a textbook for further investigation and analysis by students. The use of a recommended textbook as an adjunct to a lecture, develops the ability of students to learn independently and to identify the most important aspects of a specific topic.

They also frequently present a wider range and depth of material in an alternative manner to that presented in a lecture.

Students need to have confidence in the expertise and knowledge of those who are responsible for teaching them. As a nationally and internationally recognised author, I believe that this inspires and engages my students, particularly in the case of structural design. Design is carried out in the UK and in many countries overseas using British Standard Design Codes. To be taught by an engineer/lecturer who is the author of textbooks used not only in universities etc, but also currently in industry, makes the students realise that the knowledge and information being disseminated is not dated and is of value in their future career.

The use of Structural Design Codes in the UK is currently undergoing significant change, which will eventually result in their replacement with Eurocodes. The publication of one of the first texts in this field (ie *Design of structural timber to EC5*), by myself and co-author Dr. B. Zhang in September 2007 is a further indication that lecture material and experience is at the forefront of current knowledge.

My teaching in postgraduate courses incorporates ongoing development work in relation to the new design Eurocodes, some of which are still only published in draft form.

In combination with the authorship of textbooks, the preparation of 'Expert Witness Reports' in support of litigation following structural failures is another very useful vehicle for disseminating knowledge and experience and encouraging enthusiasm within the students. In my own case, I frequently use case studies based on the details of reports which I have prepared for litigation, to illustrate technical details. The information from such studies can also be used in individual project work or to support group project work.

Things to look out for and tips

Research the material very well before preparing the text and present it in a manner which will be understood by someone who does not yet have your experience and understanding.

Does it work?

Many of the students certainly seem to be enthusiastic, particularly when they realise that the material they are using is currently used in design offices by practising engineers.

What problems/issues have arisen?

Avoid the temptation to simply use/present the material in a textbook. I use it to complement my lectures and wherever possible try to present the material in a different way from the books.

Areas to be developed/enhanced

Many new design codes are being introduced during the next few years – material must be developed/presented in a manner which can be easily interpreted by students. Current new Eurocodes are notoriously difficult to interpret and understand.

Relevant references

McKenzie, W., (1998). *Design of structural steelwork*. Basingstoke: PalgraveMacmillan

McKenzie, W., (2000). *Design of structural timber*. Basingstoke: PalgraveMacmillan

McKenzie, W., (2001). *Design of structural masonry*. Basingstoke: PalgraveMacmillan

McKenzie, W., (2004). *Design of structural elements*. Basingstoke: PalgraveMacmillan

McKenzie, W., (2006). *Examples in structural analysis*. London: Taylor & Francis

McKenzie, W., & Zhang, B., (2007). *Design of structural timber*. Basingstoke: PalgraveMacmillan

Teaching consultation skills

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

5. Giving students first-hand experience of research based knowledge transfer (whether commercial or pro-bono) (eg as an 'intern', as work-based learning, as a consultant assistant, or as a laboratory assistant).

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: MSc Applied Statistics/MA71007/Research Methods and Consultation Skills
- **Course title**: MSc Applied Statistics
- **Level and trimester/year introduced**: 4th year taught trimesters 1 and 2, postgraduate trimester 1.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge

- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

At Master's level:

- Conceptual understanding that enables critical evaluation of current research and advanced scholarship
- Originality in the application of knowledge
- The ability to deal with complex issues and make sound judgments in the absence of complete data.

What does the researcher/teacher do?

The module is taught in two parts – the first part being research methods from which students are assessed by constructing a bid for a research grant. Then the second half of the module goes through an attempt to develop consultation skills. Study is made of the consultation process, type of consulting, problem identification and resolution, project planning and costing, team working and negotiation and consultation skills. This is pursued over the course of six weeks of highly interactive two-hour sessions. A great deal of case study examples are given, many of which are based on the lecturer's own experience of consultation in both private and public enterprises. The role taken by the lecturer is to propose a problem and facilitate students to develop solutions and help them to understand the nature of clients, problem complexity and that multiple solutions are feasible.

Students are assessed via a group role-play exercise. Students in groups of no more than four are assigned clients. These clients are from either public or private organisations such as the Royal Bank of Scotland, Tesco Finance, Intelligent Finance, Solectron Ltd, Jabil Electronics, Seagate, General Register Office, Information Services Division of the NHS, Amy, Marketing Databasics, Standard Life.

The idea is that students meet the client who has a fairly unstructured, ill-defined problem. The students then work out what the problem is and how to resolve it. They then present a tender to the client to undertake the work. This tender specifies the cost and duration of the work as well as intended outputs. Each group of students has a different client and the tenders are presented in an afternoon at the end of the trimester. The students present

to an audience of their peers, staff and all the clients. This presentation is videoed and put on a DVD for the external examiner to review.

- A key aspect of the assessment is the client's impression at first meeting – this is marked by the client.
- The tender – marked by all clients and staff at the presentations.
- Feasibility of approach – marked by client.
- Contract letter – specifying costs, durations, outputs and IPR issues – marked by lecturer.
- A consultancy log – a diary of meetings etc written in a style to facilitate reflective learning – marked by the lecturer.

This assessment and allocation of clients is deliberately left till late in the module to simulate the reality of short tender times and to promote effective team working. The problems posed by clients are real ones and comments by clients suggest that going through this exercise has improved their understanding of the problems.

Things to look out for and tips

This requires a great deal of organisation and the lecturer has to be very flexible in planning as clients often drop out because of work commitments and have to be replaced at short notice.

Does it work?

Yes – students perform well – find the area interesting and are conscious of the range of new skills developed.

External examiners have given very positive feedback as do the clients; indeed a number of students have been recruited into employment from this process.

What problems/issues have arisen?

The main problem is securing clients, not because they are not interested but often because they cannot manage to attend the presentation whose date is fixed.

Areas to be developed/enhanced

The module and subject is continually evolving and new aspects arise of fundamental importance to business.

Details of support material/course work/assessment methods

These are available from Robert Raeside.

Human development investigation

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Classification category

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Course/unit/module title**: various/MA42006/Demography
- **Level and trimester/year introduced:** 4th year taught trimesters 1 and 2.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry
- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments.

What does the researcher/teacher do?

An assignment is set in which the student has to investigate some contemporary aspect of population development. Examples are:

- Evidence of rise in obesity, causal factors and possible consequences
- Is European fertility beginning to rise?
- Infant and child death, and medical provision in S.E. Asia
- Causes and consequences of ageing in European populations
- Causal factors of teenage pregnancy.

These are individual assessments which follow on from a series of lectures on population development accounting for 60% of the module assessment.

Students should critically appraise two journal articles pertinent to their chosen topic, form hypothesis, then collect and present data: this helps to develop critical skills. They then use this data to test the hypothesis and write the work up in the form of a report. The students are free to choose any topic, but the lecturer has to agree – considering data availability, ability of the student and ethical aspects.

The assessment is heavily supported by tutorials and WebCT and help is given as to data sources and analysis methods. Data is to be collected from the many excellent websites which host data on the demography of different nations, disease prevalence, causes of death, economic indicators and so on. Examples of the web sources are:

hdr.undp.org/
www.who.int/topics/statistics/en/
web.mit.edu/agelab/
www.census.gov
www.gad.gov.uk/Demography_Data/population_projections_background.asp
www.gro-scotland.gov.uk/ [all accessed December 2007].

For Scottish investigations extracts of the Scottish Health and Household surveys have been put on to WebCT and the Scottish Neighbourhood Statistics database has also been made available to students to allow investigations into aspects of social exclusion. Students are instructed not to collect their own data. By using these secondary sources students develop skills of information retrieval and of moving data between different databases and building their own data set. The data they obtain is to be numerically and graphically displayed – so developing important skills of information presentation.

Then, very often, advanced statistical methods are brought to bear to verify, or otherwise, the hypothesis. The SPSS package tends to be used for this and methods are taught in lectures and specifically in tutorials. This is a

major challenge for students, the majority of whom have little statistical and analytical background. However, it has been found that interest in the topic coupled with tutorial support allows the students to perform well.

This positive approach based on the scientific method helps students to develop their problem solving, resource acquiring, and evidence-based, decision-making skills that would be required in many public organisations, such as the role of information analyst, or in the private sector, such as business or market analysis.

After three weeks working on the assessment students give a ten minute PowerPoint® presentation outlining the literature, data sources and approach to the investigation.

This module is supported by active research which has generated a number of publications (see references section below) and input has come over the years from a number of students undertaking their PhD in demography (four completions in this area and three current students in relevant areas).

Things to look out for and tips

The lecturer must be on top of the subject and have the research and statistical skills to confidently deal with the wide range of problems thrown up by the data.

Does it work?

Yes, students perform well, find the area interesting and are conscious of the range of new skills developed. External examiners have given very positive feedback.

What problems/issues have arisen?

The main problem is getting students focused on the problem and developing skills to tackle it in a disciplined manner. Over the years it is clear that analytical skills have decreased.

Areas to be developed/enhanced

The module and subject is continually evolving and new aspects arise of fundamental importance to society. Also national compilations of data are improving and access to many is feasible. To keep up with these changes the teaching staff have to be active researchers.

Details of support material/course work/assessment methods

These are available from Robert Raeside.

Relevant references

Raeside, R., & Gayen, K., (2007). Social networks, normative influence and health delivery in rural Bangladesh, *Social Science and Medicine*. **65**, pp.900–914

Raeside, R., & Gayen, K., (2006). Communication and contraception in rural Bangladesh, *Healthcare Quarterly.* **9**(4), pp.110–122

Raeside, R., & Khan, H. T., (1998). The determinants of first and subsequent births in urban and Rural areas of Bangladesh, *Asia-Pacific Population Journal.* **13**, pp.39–72

Raeside, R., Abdalla, I.M., Barker, D., & McGuigan, D., (1997). An investigation into the relationships between social characteristics and road accident casualties and accident locations, *Accident Analysis and Prevention*. **29**(5), pp.583–593

Raeside, R., & Khan, A., (1996) 'Factors affecting the most recent fertility in Bangladesh', *Social Science & Medicine*. **44**(3), pp.279–289

Raeside, R. and Khan, A. (1996). Factors influencing the probability of birth in urban and rural Bangladesh, *ZAMM – Zeitschrift für Angewandte Mathematik und Mechanik*. **76**(3), pp.471–472

Making research relevant

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Classification category

1. Developing student appreciation of research/knowledge transfer in the discipline.

2. Development of student research/knowledge transfer skills (explicitly, in addition to other disciplinary and generic skills).

3. Using teaching and learning processes, which simulate research, processes (eg project-based modules, dissertation modules, inquiry-based learning).

4. Using assignments which involve elements of research processes (eg literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').

6. Bringing data/findings from staff research/knowledge transfer into the curriculum.

Context

- **Module title**: Management Accounting Applications (AF32005)
- **Course title**: BA Accounting and joints
- **Level and trimester/year introduced**: level 9, year 3, and trimester 2.

Graduate attributes developed

At undergraduate level:

- Critical understanding
- Informed by current developments in the subject
- An awareness of the provisional nature of knowledge, how knowledge is created, advanced and renewed, and the excitement of changing knowledge
- The ability to identify and analyse problems and issues and to formulate, evaluate and apply evidence-based solutions and arguments
- An ability to apply a systematic and critical assessment of complex problems and issues
- An ability to deploy techniques of analysis and enquiry

- Familiarity with advanced techniques and skills
- Originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments
- An understanding of the need for a high level of ethical, social, cultural, environmental and wider professional conduct.

What does the researcher/teacher do?

The revised module descriptor for Management Accounting Applications, which was approved at the end of 2006, was designed to meet a number of objectives, including:

- Making students appreciate that research is relevant to the business world – it isn't just an arcane academic activity of interest to a few individuals.
- Providing a springboard to the Honours year, in particular, the dissertation module.

Students, from my experience as a dissertation module leader and dissertation supervisor, face a number of 'obstacles' in relation to in-depth research when they attempt it for the first time, including:

- What will I research?
- What sector/business will I focus on?
- How should I undertake the research, in particular, primary research?
- Who should I contact for my primary research?
- I've never done anything like this before!

The starting point for this module was the identification of a business sector that would provide a focus for learning, teaching and assessment. The process industry was chosen since it is comprised of a number of sub-sectors that make everyday products students are familiar with and is an important sector in most economies around the world. Students were provided with a key article that set the scene for the process industry and explained key aspects associated with this sector and their implications. Students were formed into research groups at the first lecture. Students worked in groups to make the research process, which was to be undertaken over 10/11 teaching weeks manageable and provide peer help and support.

Research topics were selected by the module leader from the syllabus and allocated on a random basis to each group. These topics were not covered in classroom teaching or included as specific questions in the case study exam. The business sector selected for research was food and drink. The reception from students to the selection of this sector was favourable. Students were also informed that their target audience would be members of the Food and Drink Federation which has approximately 300 members.

While each group was randomly allocated 40 plus companies from this trade association, groups were also advised they could contact other suitable companies who are not members of that association.

Each group was asked to prepare a Management Report (maximum of 5,000 words, excluding appendices etc), and a ‘mini-dissertation’ on their research topic for the senior management of a food and drink company comprising the following sections:

- executive summary
- introduction
- literature review
- research methods
- analysis and discussion of research findings
- conclusions and recommendations
- references.

Students were given a Management Report Guide that provided detailed information about the report they had to prepare for their coursework. The coursework, which also included a presentation of research findings, represented 40% of the module marks, the report 25% and the presentation 15%. Students were also advised that the exam would include a question in relation their research.

The first three weeks of the module were principally concerned with providing an introduction to research methods, helping students create a research aim and objectives. Groups were advised to allocate tasks amongst the group, review material created by other group members, meet on a regular basis physically and digitally. The research reports and presentations were scheduled for week 11, which was after the Easter holiday, to give students ample time to complete the research process.

Students were supported throughout the research process. However, a critical stage for each group was the development of a questionnaire. The importance of creating a questionnaire that could obtain information from respondents who use a particular technique and those who did not (since valuable information can be obtained from non-users) had been emphasised previously. Students also appreciated the need to undertake a thorough literature review to enable them to construct primary research that would build on their secondary research. All groups contacted both lecturers teaching on the module to obtain feedback in relation to their drafts.

While the average response rate from the surveys was in line with that normally achieved for management accounting research, one group failed to obtain any primary data. This group considered the reasons why they didn’t obtain any responses in their report. Interestingly, the group that obtained the highest number of responses was the one that made the most effort to obtain named contacts.

The principal issue faced by some groups was working as a group. Group working is rarely without problems for a variety of reasons; look at 'The Apprentice'! However, working in groups is a reality that most students will face in their careers. Despite a number of issues, only one group was unable to maintain its initial membership. The one student who was 'ejected' from that group will be given an alternative piece of coursework.

Both lecturers who taught on this module were able to draw on their research, including published articles, for a number of the topics covered. Students could consequently see that research which informs or illuminates topics is of practical value. While one group of students undertook research in relation to one of the lecturer's research areas, scope for such research is limited due to the number of research topics required for this module.

The research presentations went well and some of the presentations were very professional. Marks were awarded for group participation to encourage engagement via peer pressure. Nearly all of the students took an active part in the presentations. Students often find it difficult to prepare conclusions and recommendations. However, all groups were able to come to conclusions and recommendations and discuss them at their presentation. Perhaps the need to present their findings clarified what is required for this part of the process?

While some reports were better than others (no-one failed) all groups produced a Management Report comprising the sections outlined above. Feedback was provided to inform groups how they had performed in relation to the marking criteria to improve future academic/business research. One of the exam questions also asked students to reflect on their research experiences: what was done well/poorly, how something could have been done better, what would they do differently in the future etc. Students who take an Honours year should consequently find the dissertation module less daunting since they have produced a structured, pared-down dissertation in their third year. All students should also appreciate that research is a fundamental aspect of business, not just something done by academics.

Things to look out for and tips

- Organise groups sooner rather than later to enable them to gel together early in the module.
- Don't accept late comers (without very good reason that must be explained) since they are less likely to be accepted by their groups.
- Pick a business sector that students can relate to.
- Award marks, where possible, for group activity/participation.

Does it work?

The simple answer is 'yes' since the average mark for coursework was 64%. Students engaged with this module and produced/made good to excellent

reports/presentations that (generally) identified issues and discussed research findings. One colleague who had recently assessed Honours year and postgraduate presentations considered that most of the presentations on this module were of a higher standard. While positive comments were also received from the students about this module, more research is required in relation to the module and its value for students who take an Honours year.

What problems/issues have arisen?

As mentioned above, the key issue was group working since a few groups experienced some problems. But this is not unusual. Next year, students will be encouraged to form groups prior to the start of trimester 2 to reduce the potential for group conflict. Virtually all students who take this module are on BA Accounting and joints. Students from other programmes can be allocated to the pre-formed groups in weeks 1/2.

Areas to be developed/enhanced

- Consideration will be given to using a group mark allocation system to enable an equitable allocation of marks to be made amongst a team. This would also encourage team members to pull their weight since 'passengers' would be 'penalised'.
- The maximum number of words will be set at 4,500 +/–10% since most reports were between 4,000 and 5,000 words.
- The case study will be provided to students earlier in the trimester to enable them to start work on pre-exam work sooner and enable a further week to be added to the research process. It was not possible to give the case study to students until after Easter since this module was approved in late 2006.

Details of support material/course work/assessment methods

The following documents are available from Grahame Steven:

- module descriptor, syllabus, 2007 scheme of work
- management report guidelines
- coursework feedback form
- exam paper.

Relevant references

This module has strong links with the Research-Teaching Linkages Quality Enhancement theme being promoted by SHEEC as explained by Brew, Jenkins, Land & Kreber in their presentations earlier this year available at www.enhancementthemes.ac.uk/themes/ResearchTeaching/presentations.asp [accessed December 2007].

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