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Linking Teaching and Research

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Quotes that introduce the session

“ . . . The research universities have often failed, and continue to fail their undergraduate populations, thousands of students graduate without seeing the world - famous professors or tasting genuine research Boyer Commission (1998, 3) Re-inventing Undergraduate Education: Boyer Commission on Educating Undergraduates in the Research University.” University of Stony Brook, New York

“The challenge is to demonstrate that the learning and research environments, at the undergraduate level are not competitive but complementary.” Piper M C (2001)
Presidential Address, University of British Columbia

“We are all researchers now . . . Teaching and Research are becoming ever more intimately related . . . In a ‘knowledge society’ all students – certainly all graduates – have to be researchers. Not only are they engaged in the production of knowledge; they must also be educated to cope with the risks and uncertainties generated by the advance of science.” Peter Scott, Vice Chancellor of Kingston University ‘High wire: We are all Researchers now, *The Guardian Education*, January 28, 2002, 13

“I believe that the main hope for realising a genuinely student centred undergraduate education lies in re-engineering the teaching – research nexus.” Paul Ramsden (2001)
Pro Vice Chancellor (Learning and Teaching), University of Sydney

Selected Publications

Healey, M. 2000: Developing the scholarship of teaching in higher education: A discipline based approach, *Higher Education Research and Development*, 19 (2), 169-189.

Healey M J and Jenkins A (editors) (forthcoming) Linking Teaching and Research: Special Issue of *Exchange* November 2002

Jenkins A (1998) *Curriculum Design in Geography*, Cheltenham: University of Gloucestershire, Geography Discipline Network

Jenkins A (2000) The Relationship between Teaching and Research: where does geography stand and deliver, *Journal of Geography in Higher Education*, 24, (3), 325-351 (public pdf version at <http://www.brookes.ac.uk/genericlink/documents/Alan-JGHE2000.pdf>)

Jenkins A, Blackman T, Lindsay R and Paton-Saltzberg R. (1998). Teaching and Research: Student Perspectives and Policy Implications. *Studies in Higher Education*, 23 (2), 127-141.

Jenkins A, Breen R, Lindsay R and Brew A (2002) *Re-shaping Higher Education: Linking Teaching and research*, London, Kogan Page /SEDA

Jenkins A and Zetter R (2002) *Linking Teaching and Research in Departments* Generic Centre /Learning and Teaching Support Network. October

Lindsay R, Breen R and Jenkins A (2002) Academic Research and Teaching Quality: the Views of Undergraduate and Postgraduate Students. *Studies in Higher Education*, October. Interim report at: http://www.brookes.ac.uk/services/ocsd/5_research/pedres/lindsay.html

SECTION 2: A National (and Potentially International) Project

Linking Teaching and Research in Geography, Earth and Environmental Sciences

This is part of a larger project on linking and teaching and research in the Disciplines (<http://www.brookes.ac.uk/genericlink/index.htm>; url will soon change to be part of <http://www.ltsn.ac.uk/genericcentre/default.asp>) also involving Bioscience; Geography, Earth and Environmental Sciences; Hospitality Leisure Sport and Tourism; and Law.

Aim

To identify, record and disseminate case studies of the way individuals, course teams and departments within geography, earth and environmental sciences enhance the learning of their students by developing the links with their research and to promote ways in which individuals and departments in our subject communities can maximise the benefits for students of these linkages.

Types of Linkage between Teaching and Research

We recognise that students in our subject areas may benefit from research in a variety of ways including, where:

- the content of courses is informed by staff research;
- students learn about research methods;
- teaching methods adopt a research-based approach, such as through problem based learning;
- they undertake their own research projects, whether individually or in teams;
- they participate in staff research projects as subjects, as in, for example, perception studies;
- they assist staff with their research projects;
- staff undertake pedagogic research which benefits the quality of their teaching.

Research in this context is interpreted widely to include RAE-level research, consultancy for clients, and action research aimed primarily at improving practice. We recognise that there are also potential negative impacts from staff involvement in research, such as staff absences and lower priority being given to teaching. Our experience is that for the benefits to be maximised and the disadvantages to be minimised, the relationship needs to be managed.

An Invitation: Several examples of the relationship between teaching and research in our disciplines have already been published (e.g. Dwyer, 2001; Gardiner, 1993; Jenkins, 2000; Winchester, 2001). We would like to invite colleagues in the UK and overseas to contact us to tell us about other examples. A proforma is available at the

project web site (<http://www.gees.ac.uk/linktr/linktr.htm>) and at the end of this pack. There are prizes to be won for case studies (500+ words) put on the GEES Web site.

Dwyer, C (2001) Linking research and teaching: a staff-student interview project, *Journal of Geography in Higher Education* 24(3), 357-366

Gardiner, V (1993) Teaching, learning and research - on the separation of the indivisible, *Journal of Geography in Higher Education* 17(2), 180-186

Jenkins, A (2000) The relationship between teaching and research: where does geography stand and deliver? *Journal of Geography in Higher Education*, 24, 325-351

Winchester, H P M (2001) The relationship between teaching and research in Australian geography, *Journal of Geography in Higher Education* 25(1), 117-120

SECTION 3: The Classic Connections

A UK perspective

UK Robbins Report argued that University staff should both teach and carry out research on the grounds that "the element of partnership between teacher and taught in a common pursuit of knowledge and understanding, present to some extent in all education, should become the dominant element as the pupil matures It is of the upmost importance that the ablest, who are capable of going forward to original work, should be infected at their first entry to higher education with a sense of the potential of their studies." (para 555).

A US perspective

The American scholar Burton Clark argued that "research activity can and does serve as an important mode of teaching and a valuable means of learning ... (He further argues that) "student involvement in research is an efficacious way to educate throughout the education system the great mass of students, as well as the elite performers, for the inquiring society into which we are rapidly moving" (p242, emphasis added)

Committee on Higher Education Higher Education (The Robbins Report), (1963) London, Her Majesty's Stationary Office. HMSO.

Clark B. R. (1997) The modern integration of research activities with teaching and learning, *Journal of Higher Education*, 68, (30, 242-255).

SECTION 4: The Lack of interactions between research and teaching: The Evidence from Surveys of Practice

Students not tasting research?

. . . The research universities have often failed, and continue to fail, their undergraduate populations, thousands of students graduate without seeing the world - famous professors or tasting genuine research. *Re-inventing Undergraduate Education: Boyer Commission on Educating Undergraduates in the Research University* (1998) Carnegie Foundation for the Advancement of Teaching. p1

Staff not appreciating the nature of the connection? Or perhaps not having a language to talk about it?

An Audit of Exeter University (UK) stated:

"The Account argues strongly for the continuing and crucial value of the link between teaching and research; it acknowledges though that this relationship is more often assumed than explained. The audit team was told that this was a major question to be addressed, yet encountered staff who sometimes struggled to appreciate its significance. In practice, the precise relationship of the link between research and teaching seems not to have been addressed in any concerted way."

Higher Education Quality Council: Academic Quality Assurance Group (1997, 3) *Academic Quality Audit, The University of Exeter*, London, HEQC, p3

No mission or mechanisms?

" We found that only about 50% of institutions had any statement (in their teaching and learning strategies) resembling a commitment or objective in their strategies that research should have any impact on teaching, and a much smaller proportion (approximately 10%) identified in any detail the mechanisms by which this might be achieved."

J M Consulting (2000) *Interactions Between Research, Teaching, and Other Academic Activities*: Bristol, HEFCE (Higher Education Funding Council for England).

SECTION 5: The lack of positive/causal interactions between research and teaching: The evidence from research

An Enduring Myth

"That good teachers are good researchers is a myth and that, at best, the association between ratings of undergraduate instruction and scholarly productivity is a small and positive one, with correlations in the .10 to .16 range" (Terenzini and Pascarella, 1994, p30).

Loosely Coupled

In a meta analysis of these correlations studies of university academics Hattie and Marsh (1996) considered 58 research articles contributing 498 correlations and found that the overall correlation was 0.06. *"Based on this review we concluded that the common belief that teaching and research were inextricably intertwined is an enduring myth. At best teaching and research are very loosely coupled"* (Hattie and Marsh, 1996, 529) (emphasis added).

Student Dissatisfaction

Astin (1993) and Astin and Chang (1995) in a study of 200 US four-year undergraduate colleges and using sophisticated measures of student development, concluded that: "a college whose faculty is research-orientated increases student dissatisfaction and impacts negatively on most measures of cognitive and affective development. "Astin (1993, 363). The few institutions in this study that scored high on both 'teaching' and 'research' were a few rich, private colleges.

An Enduring Myth/ No Convincing Evidence

"there is little functional interaction between undergraduate teaching and discovery research." (Ontario Council on University Affairs, 1994, p.18).

"I have not seen any convincing evidence for a causal relationship between teaching and research." Bahram Beckhradnia, Director of Policy for the Higher Education Funding Council for England (1998).

- Astin A.W. (1993) *What Matters in College? Four Critical Years Revisited*. San Francisco: Jossey Bass
- Bekhradnia B. (1998). *The Polarisation of Teaching and Research - False Dichotomy, Principled Policy or Damaging Expedient?*, *Research and Scholarship*, Southampton, Southampton Institute.
- Hattie J. and H. W. Marsh (1996). "The Relationship Between Research and Teaching: A Meta-Analysis." *Review of Educational Research* 66(4): 507-542.
- Ontario Council on University Affairs (1994) *Undergraduate Teaching, Research and Consulting/Community Service: What are the functional interactions? A Literature Survey*. Toronto, Ontario.
- Pascarella E.T. and Terenzini P.T. (1991) *How College Affects Students*, San Francisco, Jossey Bass
- Ramsden P. and Moses I. (1992) Associations between research and teaching in Australian higher education, *Higher Education*, 23, pp 273-295.
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SECTION 6: Disconnecting Research and Teaching: The Pressures for Research Selectivity and the Impacts of Selectivity (The Challenge of a 'mass higher education system.')

"Despite the evidence of a synergistic relationship between teaching and research , we make no recommendation about this: it would be wrong to allow teaching issues to influence the allocation of funds for research." HEFCE, (2000) 00/37, *Review of Research*, Bristol, Higher Education Funding Council for England -para 175, 26.

"Scholarship should be required of all academics who teach." HEFCE should make it clear that its funds for teaching include an element intended to enable staff to engage in scholarship." Ibid.

Misplaced Priorities to Research

Boyer (1990, X11) argued that: "Research and publication have become the primary means by which most professors achieve academic status, yet many academics are drawn to the profession precisely because of their love for teaching or for service"

The Pressures for Research Selectivity (with particular reference to the UK)

Unintended Consequences in the UK - and generally elsewhere - the funds for teaching and research are separate. In teaching there is (some) equity in funding. However in research funding is highly selective. Much university research is funded through the Research Assessment Exercise (RAE). Its purpose is to produce high-quality research through competitively concentrating it in selected departments and institutions. It was not expressly designed to have any impact on teaching. Studies have shown that the RAE has had unintended consequences.

In a HEFCE commissioned research study of the impact of the 1992 RAE on institutional and individual behaviour, McNay (1997 a and b) used focus groups with staff and institutional managers, document studies and questionnaires to assess the impact of the RAE.

McNay (1998, 196) in a later, non-official report shows how the funding rewards the RAE offered led, at the level of the individual, the department and the institution, to "a gradual separation, structurally of research from teaching Department heads

reported that: "good researchers spend less time teaching ... and more undergraduate teaching is done by part-timers and postgraduates" (ibid., p199) emphasis added.

Boyer E. L. (1990) *Scholarship Reconsidered: Priorities of the Professoriate*. New Jersey, The Carnegie Foundation for the Advancement of Teaching.

McNay, I. (1997a) *The Impact of the 1992 RAE on Institutional and Individual Behaviour in English Higher Education: summary report and commentary*, Bristol, HEFCE: Chelmsford: CHEM/APU.

McNay, I. (1997b) *The Impact of the 1992 RAE on Institutional and Individual Behaviour in English Higher Education: the evidence from a research project*. Bristol, HEFCE.

McNay, I. (1998) The Paradoxes of Research Assessment and Funding. *Changing Relationships between Higher Education and the State*. M. H. and B. Little. London, Jessica Kingsley, 191-203.

SECTION 7: Disconnecting Research and Teaching: The Challenge of a 'mass higher education system.'

The problems of class sizes (UK examples)

In 1963 in the UK the average university lecture had 27 students, a seminar/discussion group 4 and a practical /laboratory class 9.

1979 one in eight of an age cohort went into higher education; 1990 one in five; now c. one in three (Gibbs and Jenkins, 1992).

Different Students and Different Motivations

Are there more students with a less well prepared academic backgrounds; different motivations - less academic, more vocational? With less motivation/capacity for involvement in research?

Different Disciplines: The rise of the professional disciplines for whose staff research has to 'compete' with professional practice and consultancy; and whose students may not have any strong motivation for academic research. (Even at postgraduate level?)

Continued Budget Cuts

Globally in state supported institutions - including in the US?, there have been continued budget cuts / efficiency gains. This certainly a major issue in UK and Australia. In the UK resources per student have declined by 38% since 1989. (<http://www.universitiesuk.ac.uk/funding/report3.asp>)

Different Institutions: Development of diversified higher education system; and for many staff there will be little or no funding for scholarship and certainly not for high level research. While will their students need something different from an enquiry/research based approach?

Information Technology and Globalisation: These linked processes are challenging the view of teaching and research linked at individual institutions; making even more possible the 'physical' separation of research and researchers from students?

References:

Gibbs G and Jenkins A (eds) (1992) *Teaching Large Classes in Higher Education : how to maintain quality with reduced resources*, London, Kogan Page.

HEFCE (2000) 00/37, *Review of Research*, Bristol, Higher Education Funding Council for England.

Jenkins A (2000) The Relationship between Teaching and Research: where does geography stand and deliver, *Journal of Geography in Higher Education*, 24 (3), 325-351.

SECTION 8: Is Undergraduate Research for All or for Selected Students (for Honors or Selected Honors Students)?

"To obtain an honours degree, a student must gain at least two module credits from project, dissertation or synoptic modules" (Oxford Brookes Undergraduate Modular Course) (emphasis added).

Extracts from some web sites from US Honors Programs

- "Learning Community composed of talented and highly motivated students"
 - "Average class size is 18 students"
 - "Honors Contract, independent study, thesis, and study abroad opportunities."
 - "Access to state-of -the-art computer equipment"
 - "40,000 dollar annual research grants to undergraduates"
 - "Extended library check-out (6 months)"
 - "You will be admitted if you have a 3.5 G.P.A. of twelve or more academic units...You have to maintain a 3.5 G.P.A. to stay in the College"
 - "Early registration for all courses"
 - "Increased faculty to student interaction through research opportunities".
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SECTION 9: Making Contemporary Connections: Pointers from Recent Research

Connections through learning and course design

Angela Brew and David Boud (1995) criticise the emphasis on correlation studies and call for "more fine grained studies" (p 272), focused on how academics experience teaching and research. They hypothesise that "if there is a link between the two it operates through that which teaching and research have in common ; both are concerned with the act of learning" (p261 They suggest that "teaching and research are correlated when they are co-related" (ibid) and in conclusion suggest that one way to achieve this is to "exploit further the link between teaching and research in the design of courses." (p272) (emphasis added).

Up to date courses and recognise that staff are real people

In a large Australian research - oriented institution, some 28 students in a range of disciplines and from first year undergraduate to doctoral students were interviewed in depth by Ruth Neumann on their experiences of teaching and learning. Her conclusions were that: there were tangible benefits to students of staff research, mainly through students perceiving that their courses were up-to-date and that staff demonstrated interest in what they were studying. Also, staff research interests gave students "the opportunity to see their teachers as real people and to be able to glimpse what they do, how and why" (Neumann, 1994, 335).

Are some students indifferent?

A related-questionnaire based study at Brookes (Breen and Lindsay, 1999) analysed student views of (staff research) in the context of their motivations for study/attending university. Students who came to university for social contacts or to gain a useful qualification were indifferent to staff research. Students who claimed to be interested in learning for its own sake were more likely to express positive attitudes to academic research and staff involvement in that research. A third group of students who described themselves as having no interest in communicating with staff were the only ones who demonstrated an overall negative view of staff research.

Institutional and Disciplinary Cultures are Important

Carol Colbeck (1998) sought to move beyond much of the previous research which treated research and teaching as separate categories. The behaviour and roles of some twelve academics were studied in detail, amongst other things seeking to understand how "university, departmental and disciplinary contexts influence the ways and extent to which faculty integrate teaching and research" (op cit, 649). The behaviour of 12 staff in two contrasting disciplines in very different US institutions, (the names are fictions to disguise): one 'Vantage' a high prestige research university, (according to Carnegie Classification a Research University 1) and Cosmopolitan University (a Masters University 1). In both universities she observed staff from two departments from contrasting disciplines, physics and English studies.

Paradoxically, staff in the less well resourced comprehensive university found it easier in one respect to link their teaching and research. At Vantage University, 'research' for faculty evaluation was narrowly (or some would say precisely) interpreted to mean standing as an original researcher amongst peers in the discipline. By contrast at Cosmopolitan University faculty evaluation for 'research' included the writing of textbooks and creative works in popular media. Colbeck (ibid, 661) draws a strong contrast between two physicists. Of her sample of twelve staff the person who demonstrated in how they spent their time the strongest integration between their teaching and research roles, was a physicist at Cosmopolitan University "whose research involved writing an introductory textbook incorporating new pedagogical techniques". By contrast at Vantage university a physicist who previously had written an acclaimed computer aided physics course text had declined to write a follow up because he knew his " department colleagues would not recognise the value of such a project" (emphasis added).

Breen R. and Lindsay R.(1999). "Academic Research and Student Motivation." *Studies in Higher Education* 24(1), 75-93.

Brew A. and Boud D. (1995) Teaching and Research: Stabilising the vital link with learning, *Higher Education*, 29, 261-273.

Brew, A.(1999,a) "Research and Teaching : changing relationships in a changing context." *Studies in Higher Education* 24 (3): 291-391.

Colbeck C. (1998). "Merging in a Seamless Blend" *The Journal of Higher Education* 69(6): 647-671.

Neumann R.(1994) "The teaching /research nexus: applying a framework to university students' learning experiences, *European Journal of Education*, 29.(3) pp 323-339.

SECTION 10: So here is an Overall Perspective from the Research Evidence: If we want the connection it has to designed - and the key in part lies in how students learn

Increase the circumstances and the rewards

"Based on this review we concluded that the common belief that teaching and research were inextricably intertwined is an enduring myth. At best teaching and research are very loosely coupled " The strongest policy claim that derives from this meta analysis is that universities need to set as a mission goal the improvement of the nexus between research and teaching. The goal should not be publish or perish, or teach or impeach, but we beseech you to publish and teach effectively. The aim is to increase the circumstances in which teaching and research have occasion to meet, and to provide rewards not only for better teaching or for better research but for demonstrations of the integration between teaching and research." ... Examples of strategies to increase the relationship between teaching and research include the following: Increase the skills of staff to teach emphasising the construction of knowledge by students rather than the imparting of knowledge by instructors ... develop strategies across all disciplines that emphasise the uncertainty of the task and strategies within the disciplines ... ensure that students experience the process of artistic and scientific productivity."

Hattie, J. and Marsh, H.W. (1996) The relationship between teaching and research: A Meta-analysis, *Review of Educational Research*, Winter, 507-542, quotations at p529, 533 and 544. Emphasis added.

Connecting Ernest Boyer and Lewis Elton: focus on student learning

Lewis Elton (2001) has recently argued that there can be a "positive nexus between research and teaching ...under particular conditions." These he sees less in terms of the outcomes (e.g. published papers of staff) than in the extent to which students learn through some form of student-centred or enquiry-based approach e.g. problem based learning. (emphasis added)

Ernest Boyer's work can also be seen as a strong argument for encouraging, even requiring a close linkage between staff research and undergraduate student learning. In *College* (Boyer, 1987), Boyer criticised the dominant passive lecture-based student experience, the separation of undergraduate education from enquiry or research process-based teaching, and the lack of connections between research-orientated staff and (undergraduate) student learning. Indeed much of the thrust of the powerful reform movement that stems from Boyer's and his colleagues work is to bring a 'research as student' enquiry guided by (research-based) staff into the US undergraduate curriculum (Carnegie Foundation, 1998) (<http://notes.cc.sunysb.edu/Pres/boyer.nsf/>)

The Boyer Commission (1998) (<http://notes.cc.sunysb.edu/Pres/boyer.nsf/>) which was set up to promote implementation of Boyer's ideas into institutional planning in 'research universities', called for ten key changes in undergraduate education, four of which directly address the teaching /research nexus, viz.:

1: *Make Research –Based Learning the Standard.* 'Learning is based on discovery based on mentoring. Inherent in inquiry-based learning is an element of reciprocity: faculty can learn from students as students are learning from faculty.'

2: *Construct an Inquiry-Based Freshman Year.* 'The first year of a university experience needs to provide new stimulation for intellectual growth and firm grounding in inquiry-based learning and communication of information and ideas.'

3: *Build on the Freshman Foundation.* 'The freshman experience must be consolidated by extending its principles into the following years. Inquiry –based learning, collaborative experience, writing and speaking expectations need to characterize the whole of a research university education.'

7: *Culminate with a Capstone Experience*. 'The final semester should focus on a major project and utilize to the full the research and communication skills learned in the previous years.'

It's a question of how we conceive and organise teaching and research: This requires actions by individuals, course teams, departments, institutions and national systems.

"Research has demonstrated that the 'nexus' between teaching and research is potentially a valuable one for student learning, in particular for those students with a strong academic orientation to their studies. Realising the link is probably dependent upon staff who see research as enquiry, and teaching as helping students to construct their understanding; and where the curriculum, including how students are taught and assessed mirror the research processes (in our discipline)

For this nexus to be realised requires careful planning and organisation. There is some evidence that course teams can achieve this. However we know little as to how departments, institutions, national systems and disciplinary communities can achieve this, though there are pointers to action (Jenkins, 2000, 344).

Boyer E L (1987) *College: The Undergraduate Experience in America*. New York, Harper Collins.

Boyer E L (1990) *Scholarship Reconsidered: Priorities of the Professoriate*. New Jersey, The Carnegie Foundation for the Advancement of Teaching.

Carnegie C F (1998) *Re-inventing Undergraduate Education: Boyer Commission on Educating Undergraduates in the Research University*. Stony Brook, Carnegie Foundation for the Advancement of Teaching.

Elton L (2001) Research and teaching: what are the real relationships? *Teaching in Higher Education*

Jenkins A (2000) The Relationship between Teaching and Research: where does geography stand and deliver, *Journal of Geography in Higher Education*, 24 (3), 325-351

SECTION 11: Three case studies from geography of Curricula that are explicitly designed to link aspects of (staff) research to student learning

A research based department

At University College London (an elite research based University - equivalent to a Carnegie Intensive Research University), the Geography Department requires all year one students to do an assignment in term one, in which students interview a member of staff about their research.

- Each first year tutorial group is allocated a member of staff who is not their tutor.
- Tutorial groups are given by that member of staff three pieces of writing which are representative of their work, their CV and arrange a date for the interview.
- Before the interview students read these materials and develop an interview schedule etc.
- On the basis of their reading and the interview, each student individually writes a 1,500 word report on a) the objectives of the interviewee's research; b) how that research relates to their earlier studies c) how the interviewee's research relates to his or her teaching, other interests and geography as a whole (emphasis added).

This exercise has now been done at UCL for over ten years in slightly different forms. A similar exercise is used at the University of Manchester, which was introduced by an ex-UCL member of staff.

Dwyer C (2001) Linking Research and Teaching: a staff - student interview project: *Journal of Geography in Higher Education*, 25 (3), 357-366.

A teaching department

While such an assignment may be particularly appropriate to an elite research department: the basic model for this course was devised at the then Oxford Polytechnic (now Oxford Brookes) which was then not funded for research.

- The course was a final year synoptic module on the nature of geographic thought /practice. Lectures and readings set out the main directions and controversies in the discipline.
- Students were divided into groups and each group allocated a member of staff, who gave them a copy of their CV.
- A student group then interviewed that member of staff (with the rest of the students attending), about their academic history and views on the nature of contemporary geography.
- The student group then wrote up the interview and set that persons' view of the discipline in the wider context of the contemporary discipline.

Cosgrove D (1981) Teaching geographical thought through student interviews, *Journal of Geography in Higher Education*, 5 (1), 19-22.

Going beyond the department

- The geography BA degree at Liverpool John Moores University (not a research based University; similar to Brookes) includes a compulsory third year synoptic course on Urban and Geographical Thought.
- A required assignment is an essay which " With regards to a key geographer or urbanist, summarise the main features of her/his work, show how this relates to methodology, and develop critiques of this work from one of the methodological perspectives presented in the module." This assignment requires extensive bibliographic work ... and when well prepared by this -and should the scholar be still alive! - students may contact the researcher by email ... to ascertain specific questions. (They are not allowed to do a study of staff in their department.)

SECTION 12: Strategies for linking teaching and research (and consultancy) at the level of the module/ course at undergraduate /postgraduate level

This is a basic model that individuals and course teams can adapt and use to consider their current curriculum and in designing new courses. Aspects of it are further developed at <http://www.brookes.ac.uk/services/ocsd/link1/cdesign1/cd1.html>

Develop students understanding of the role of research in their discipline

- Develop the curriculum to bring out current/or previous research developments in the discipline
- Develop student awareness of learning from staff involvement in research.
- Develop student understanding of how research is organised and funded in the discipline/institution.

The three illustrative case studies develop these approaches.

Develop students' abilities to carry out research/consultancy in their discipline

- Develop the curriculum, in particular how students learn in ways that mirror/support the research/consultancy processes in the discipline

- Assess students in ways that mirror/support the research/consultancy processes in the discipline. For example requiring students to have their work assessed by colleagues according to the house style of a (fictitious) journal before submitting it to you; this mirrors how academic journals use referees to decide on whether an article is to be published.
- Provide training in relevant research/consultancy skills/knowledge
- Develop student involvement in staff research/consultancy

Perhaps, restrict certain research opportunities to selected students? This is the effective approach developed in those UK/Australian institutions which require a dissertation for Honours Degrees. In the USA which has long operated a mass higher education system, students being involved in research with staff is mainly only for those with high grades?

Manage student experience of staff research/consultancy

- Limit the negative consequences for students of staff involvement in research/consultancy. Most important here is managing the student experience of the days (and sabbatical terms) when staff are 'away' doing research. At a minimum students need clear information as to when staff are available/away.
- Evaluate/research student experience of research/consultancy and feed that back into the curriculum.
- Support students in making clear to them the employability elements of research and consultancy. This is particularly important for those students whose focus is on using a degree to get employment - and who may not otherwise appreciate the value of a research based approach.

Other strategies you have developed

Jenkins A et al (2002) *Re-Shaping Teaching in Higher Education: Linking Teaching and Research*, London, Kogan Page /SEDA_

SECTION 13: Institutional Strategies to Link Teaching and Research

"The analyses reveal ways in which it is possible to work to strengthen the connections between teaching and research, and highlight that it is valid and important for universities to address the nexus through measures consistent with their mission, goals and objectives. Since universities differ, it is appropriate that the means also differ ..."

Zubrick A, Reid A and Rossiter P (2001) *Strengthening the Nexus between Teaching and Research*, Canberra, Australian Government Publishing Service.

http://www.detya.gov.au/highered/eippubs/eip01_2/default.htm

"How does the institution ensure that teaching and learning are different from what would occur if there were no research and how is this difference measured?" University of Auckland (2000) *Academic Audit Portfolio*.

State linking teaching and research as central to the institutional mission

Southampton University (UK) (A research based university) "The University will continue to offer a curriculum which communicates the findings of recent research ... The commitment is to an ethos of curiosity-driven inquiry and intellectual excitement on the

part of students and staff." Southampton University (UK) (2000) *Learning and Teaching Strategy*

Make it the mission and deliver it

The University of Roskilde (Denmark) opened in 1972 and its origins are in the radical university politics of the 1960's and Marxist concerns for praxis, i.e. of integration theory and practice. It also sees its origins and current policies in the European/Humboldt tradition of the university as an institution that links teaching and research.

- In years 1-2 at least 50 % of student time/the assessed curriculum is taught through project work.
- The projects involve students working in groups guided by staff. "Problem-orientated project work ...are participant directed indicating that it is the group members that collectively ... take the responsibility for the project ... The result is a body of knowledge owned for the most part by the students that produced it and not borrowed from the teachers who taught it" (Legge, 1997, 5).

Organise events/publications to raise institutional awareness

(Use Boyer/Carnegie analysis to) develop institutional conceptions and strategies to effect teaching /research links

The University of Ballarat (Australia: a non elite institution). To help determine its mission and strategy the University Council set up a Working Party on 'Developing Scholarship, Research and Student Life'. "In 1997 the Working Party decided to define and develop its work in terms of Ernest Boyer's four interrelated forms of scholarship ... and has sought to define itself as a place where all four scholarships thrive and are valued." (Zubrick *et al* 2001)

Develop/Audit/Teaching policies and implement strategies to strengthen the teaching/research nexus.

- Southampton University (UK) "To ask each academic department to develop a written teaching and learning strategy ... The strategy ... will include a statement of how research informs its teaching ... (and) should address how the department will take forward ... teaching within an active research environment." Southampton University (2000) *Learning and Teaching Strategy*.

Develop/Audit/Research policies and implement strategies to strengthen the teaching/research links

- Value the production of learning materials and research on discipline based pedagogy.
- Earlham College (a private liberal arts college) initiated a requirement that internal requests for research support include a pedagogic impact statement -" a description of the impact that the research is likely to have on teaching... (One of the Deans who developed this system argued) Let's talk about teaching and research at a point when something actually can be done to insure that they complement and reinforce each other" (Bakker, 1995, B3).

Ensure the nexus is central to policies on inducting/developing new staff Ensure effective synergies between units and committees for teaching and research

Ensure teaching /research links are central to policies on promotion and reward
e.g. Performance Indicators for Promotions at Auckland (New Zealand)

- Is an explicit teaching /research link included in the criteria for both teaching and research both at appointment and promotion?
- How do promotion committees reward the links (not merely reward good teaching or good research)?
- Reduction in the in the insecurity of untenured staff to succeed by primarily engaging in research. (Academic Audit Portfolio).

Develop curriculum requirements:e.g. dissertation/honors/capstone requirements

- University of British Columbia, Canada. "All undergraduate students entering UBC by the year 2003 will, in the course of a four-year degree programme, have a research-based learning experience that integrates the many research opportunities at UBC into undergraduate learning. This integration may take many forms, including research seminars, research assistantships, research projects, or research based inquiry and problem solving." Treck 2000, University of British Columbia Strategic Plan, Vancouver, Canada.

Review the timetable: just as staff need (sabbatical) time to do research so perhaps students need a different timetable than the traditional 'dispersed' curriculum where on one day they are studying a range of subjects.

- Beloit College (Wisconsin, USA) and other biology departments in US liberal arts/science colleges developing research /inquiry based curricula are "moving from four (separate) lecture hours and a lab block (generally over five days) to meeting in the lab for three two hour blocks ... Both the quantity and quality of learning are intensified." (Jungck, 1997, 36).
- Colorado and Cornell Colleges have switched to a "4-1-4 or 4-4- approach to create a time where students can focus on just one subject , allowing greater opportunity for long term fieldwork, intensive lab projects (Jungck, 1997, 36).
- In 1968 an experimental physics course was taught at Massachusetts Institute of Technology (MIT) which involved some 20 students working with one instructor for some six weeks. For these students it replaced the normal course timetable of two lectures and one seminar (Parlett and King, 1971).

Publicise, celebrate and spread what has been achieved

Support initiatives through external sponsorship

Link with related university strategies

Participate in national programmes

Support Implementation at School /Department Level

Bakker G. (1995) Using 'Pedagogical -Impact Statements' to Make Teaching and Research Symbiotic Activities. *Chronicle of Higher Education*, March 17 , B3

Legge K. (1997) Problem-Orientated Group Project Work at Roskilde University, Roskilde, Roskilde University, Department of Mathematics and Physics

Jungck (1997) "Realities of Radical Reform: Reconstructing 'Chilly Climates' into Collaborative Communities - Sharing Bio QUEST Experience." in McNeal A P and D' Avanzo C (1997)

Student Active Science : Models of Innovation in College Science Teaching, Fort Worth, Saunders College Publishing
Parlett M R, and King J G (1971) *Concentrated Study: A Pedagogic Innovation Observed*. London, Society for Higher Education.
Zubrick A, Reid A and Rossiter P (2001) *Strengthening the Nexus between Teaching and Research*, Canberra, Australian Government Publishing Service.
http://www.detya.gov.au/highered/eippubs/eip01_2/default.htm

From: Jenkins A et al (forthcoming) *Re-Shaping Teaching in Higher Education: Linking Teaching and Research*, London, Kogan Page/SEDA_

SECTION 14: Departmental Strategies to Enhance the Teaching /Research Nexus

" While each level within the University has an important role, the academic department is where the most important decisions are made and the most important work is done. It is where faculty are hired, teaching assignments are made, and salary increases are determined." John A. Brighton, "Innovations in Honors Education and Its Institutional Role", Schreyer National Conference, June 24 1999.

" We found little evidence to suggest that synergies between teaching and research were managed or promoted at departmental or institutional level...There were some attempts to manage teaching and research workloads in departments, partly to allow more time for research. Some strategies may be having the unintended consequence of driving research and teaching apart for some staff." (J M Consulting (2000) *Interactions Between Research, Teaching and Other Academic Activities: Report for HEFCE*, J M Consulting Bristol, 36)

"Research , teaching and study can exist in not so splendid isolation, with full time research staff in one corner , some teaching staff off in one corner and only slightly guided, if at all, by the results of recent research , and students studying in another corner, with codified text in hand but out of the sight of research activities and peering at distant teachers as if through the wrong end of a telescope." (Clark, B R 1993, "The Research Foundations of Post-Graduate Education", *Higher Education Quarterly*, 301)

- Develop disciplinary (and departmental) understanding of teaching and research relations
- Make it a central consideration in hiring new staff
- Ensure it is fostered through how staff roles are defined -and be careful about setting up some staff who are teaching or research only or 'concentrated'?
- Ensure it is fostered through policies for appraisal and staff development
- Develop effective synergies between research centres, course planning teams and postgraduate and undergraduate teaching
- Audit/review department based courses
- Develop special programmes or structures to foster the nexus
- Pay attention to issues of departmental culture
- Participate in National (and International Programmes)

From: Jenkins A et al (forthcoming) *Re-Shaping Teaching in Higher Education: Linking Teaching and Research: A guide for academics and policy makers*, London, Kogan Page/SEDA

SECTION 15 : Possible Strategies for National and International Organisations

"Despite the evidence of a synergistic relationship between teaching and research, we make no recommendation about this: it would be wrong to allow teaching issues to influence the allocation of funds for research." HEFCE, (2000) 00/37, *Review of Research*, Bristol, Higher Education Funding Council for England - para 175, 26.

1. Build it into the statutory /legal definitions of HE institutions, degree and professional requirements.
 - In New Zealand, the Education Act (1990) states that "university teaching and research should be interdependent and that most of the teaching should be by those who are active in advancing knowledge"
 - The Quality Assurance Agency's (2001) framework for higher education qualifications in England, Wales and Northern Ireland (<http://www.qaa.ac.uk/crntwork/nqf/ewni2001/ewni-textonly.htm>) states "An Honours graduate will have developed an understanding of a complex body of knowledge, some of it at the current boundaries of an academic discipline. Through this, the graduate will have developed analytical techniques and problem-solving skills that can be applied in many types of employment. The graduate will be able to evaluate evidence, arguments and assumptions, to reach sound judgements, and to communicate effectively."
 - Benchmarking: Thus the benchmarking statement for English states that honours graduates "will be able to conduct research through self-formulated questions, supported by the gathering of relevant information and materials and organised lines of enquiry, resulting in a sustained piece or pieces of work of sustained argumentative and analytical power"
2. Ensure there are limited negative impacts from research selectivity" At the moment, the RAE is the only funding mechanism that relates performance to reward in any meaningful way. This cannot be desirable. We need to incentivise excellence and reward performance in areas other than basic and strategic research so that the RAE will not be the exclusive focus of rewarding quality." (Newby 2001, 15).
3. Require research selectivity to support research areas that directly support the nexus
 - Build dissemination strongly into the criteria for any RAE style exercise
 - In any RAE style exercise value the production of textbooks , e-learning materials as with Hong Kong RAE (French, 1999).
 - In any RAE style exercise explicitly value /fund discipline based pedagogic research
 - Competitive awards to institutions ...for programmes that address the nexus .In the USA this is a feature of a number of programmes /awards through the National Science Foundation.
 - Selectively build grants /requirements for data from research studies to be widely available to teacher /scholars and students e.g. *Corvey Women Writers on the Web* Project at Sheffield Hallam University (UK) (<http://www.shu.ac.uk/corvey/>). Based on a collection of Romantic era literature in a German library, and largely funded through the UK, Arts and Humanities Research Board, the Corvey Project is developing a database of Romantic era women writers and selected texts. This research resource is specially designed to support students in researching and publishing using this material.

- The United States National Science Foundation (NSF) and the United Kingdom Joint Information Systems Committee (JISC) in 2001 announced a joint programme of activities in US and UK universities aimed at supporting teaching based on electronically available research materials. Four exemplar projects of up to £1.5million each over three years will be funded.
(<http://www.dli2.nsf.gov/internationalprojects/nsfjiscpreannouncement.html>)
4. Fund and support all institutions and staff for (discipline based) scholarly activity
 - Target special funds to support scholarship outside the research elite. In effect this was what in the UK Dearing (NCIHE, 1997) proposed: following a visit to the USA he was “persuaded ...of the important role of research and scholarship in informing and enhancing teaching” (para. 8.7) and proposed special funding to support such research/scholarship outside the research elite.
 - “Teaching needs scholarship, and scholarship depends on, and is distinct from research. What is required is for teaching to be animated by scholarship, and for scholarship in turn to be informed by research. We propose that HEFCE should make it clear that its funds for teaching include an element to support scholarship.” Fundamental Review of Research (HEFCE, 2000, 4 – para 23), (emphasis added).
 5. Develop external reviews of teaching and research which explicitly support the linkage
 - New Zealand's Academic Audit Unit "is required to audit not only the research policies and procedures of the university, but also how it links research and teaching , and the effect of this link" (Woodhouse, 1998, 39). This national review of all universities in terms of their delivery of the teaching/research nexus took place in 2000.
 6. National and international disciplinary organisations can support the nexus
 - Project Link, on linking teaching and research in the Built Environment Disciplines (<http://www.brookes.ac.uk/schools/planning/LTRC/index.html>)
 - Linking Teaching and Research in the Disciplines
<http://www.brookes.ac.uk/genericlink/> (with immediate links to 5 Subject Centres: Bioscience; Geography, Earth and Environmental Sciences; Hospitality Leisure Sport and Tourism; Law.
 7. Develop national and international organisations and projects to support the nexus.
 - Council for Undergraduate Research (CUR), Washington, DC. (<http://www.cur.org>)
 - Re-Invention Centre at Stony Brook – (<http://www.sunysb.edu/Reinventioncenter/>) Consortia of research intensive universities
 - Link: <http://www.linkresearch.org/> Based in San Francisco with New York and Seattle ‘outreach’ offices; in initial year was supported by Stanford Universities School of Law; Links student (and faculty) researchers with non-profit organisations and public agencies
 - Maximising the Benefits to Teaching of Research: Project commissioned by the Higher Education Funded Council for England (HEFCE) and carried out by the National Co-ordination Team at the Open University directed by Graham Gibbs. (2001-2).

French, N.J., Ko, P.K., Massey, W.F., Siu, H.F., & Young, K. (1999) Research Assessment in Hong Kong. *Journal of International Education*, 47-53.

Newby, H (2001) Opinion: Excellence should be rewarded in areas other than research, or else we risk losing quality, *Guardian Education*, November 13, p15.
Woodhouse D. (1998). "Auditing Research and the Research/Teaching Nexus." *New Zealand Journal of Educational Studies* 33(1): 39-53.

From: Jenkins A *et al* (forthcoming) *Re-Shaping Teaching in Higher Education: Linking Teaching and Research*, London, Kogan Page /SEDA

Linking Teaching and Research in the Disciplines Case Studies of Effective Practice

Entries mean prizes!

“Universities need to set as a mission goal the improvement of the nexus between research and teaching. ...The aim is to increase the circumstances in which teaching and research have occasion to meet.”

Hattie, J. and Marsh, H.W. (1996) “The relationship between teaching and research: A Meta-analysis,” Review of Educational Research, 66 (4), pp 507-542, quotation at p. 533

Thank you for considering providing us with an example of how you link your teaching with research and consultancy

Three initial questions:

1. Is this a case study that will help **other staff** as **individuals or course teams** to design, teach and/or assess a course in ways that link teaching and research?
2. Is this a case study that will help **academic departments** or **subject groups** to organise teaching and research to benefit the links?
3. **Do you want to enter your case study in a prize draw that can win you £50 in an Amazon voucher to spend on books, CD's etc?**

After 25 case studies have been entered from **across the five Subject Centres** in the project, one will be randomly drawn out of an electronic hat and win the voucher. The same will happen when 50 case studies are entered and so on. **We expect you will like to win – but first you have to send a case study!** (You can find out who wins by joining the Project email group. For details go to: <http://www.brookes.ac.uk/genericlink/email.htm>)

Once completed please email the pro-forma to one of the Project Team:

Jenny Blumhof – Environmental Sciences (J.R.Blumhof@herts.ac.uk)

Mick Healey – Geography (mhealey@glos.ac.uk)

Neil Thomas – Earth Sciences (n.thomas@kingston.ac.uk)

A downloadable copy of the proformas is available from:

<http://www.gees.ac.uk/linktr/linktr.htm>

Once edited the case studies will be displayed on both the GEES Subject Centre Web Site **and** the LTSN Project Web site.

THANK YOU FOR YOUR HELP



Linking Teaching with Research in the Disciplines

Case studies for Courses and Course teams

First consider this:

While our understanding of how to link teaching and research is still developing, we think this 'classification' will help you describe your practice to others:

1. Developing student appreciation of research in the discipline.
2. Development of student research skills (explicitly, in addition to other disciplinary and generic skills).
3. Using teaching and learning processes which simulate research processes (e.g. project-based modules, dissertation modules, problem based learning etc).
4. Using assignments which involve elements of research processes (e.g. 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 commercial consultancy (e.g. as an 'intern', as work-based learning, as a consultant assistant or as a supervised consultant).
6. Bringing data/findings from staff research/consultancy 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 5 below: and then you are automatically included in the prize draw for a £50 voucher (but we hope you will also complete the rest!). Note: it is section 5 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 address:	Tel: Fax: Email:
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3. Classification Category: *(Please choose one or more of the classifications above which best reflects your example – e.g. develop student appreciation)*

4. Context:

- **Course/unit/module title:**

- **Course title:**

- **Level:**

5. What does the teacher do? (e.g. 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 a minimum of 500 words.

6. Hot tips and things to look out for: (What is the key advice you would give someone who has decided to adapt this method?)

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

8. What problems/issues have arisen?

9. Details of support material/course work/assessment methods (perhaps attach as a separate file any details that you think would help others; e.g. the detailed instructions you give students)

10. Relevant references (to published articles / web sites by you or others that describe this method)



Linking Teaching with Research in the Disciplines

Case studies for Departments and Subject Groups

“Research, teaching and study can exist in not so splendid isolation, with full time research staff in one corner, some teaching staff off in one corner and only slightly guided, if at all, by the results of recent research, and students studying in another corner, with codified text in hand but out of the sight of research activities and peering at distant teachers as if through the wrong end of a telescope.” Clark, B R 1993,301, *“The Research Foundations of Post –Graduate Education”*, Higher Education Quarterly, 47(4), pp301-314.

First consider this:

While our understanding of linking teaching and research is still developing it is clear that as well as designing and teaching courses, the issues of departmental organisation, structure and culture are clearly important in supporting or threatening the link. We think that this ‘classification’ will help you describe your practice to others and for each one consider how they explicitly or implicitly encourage or discourage the link? (Note we are not here concerned with issues of institutional organisation except in so far they are of direct implementation at department level. Our focus here is on issues in a departments ‘control’.)

1. Policies for teaching – how do these explicitly encourage or discourage the link?
2. Policies for research - how do these explicitly encourage or discourage the link?
3. Staff recruitment
4. Programme /course evaluation monitoring and review
5. Staff development and training
6. Organising staff in the department
7. Departmental organisation and resources other than staffing
8. Departmental culture

While we hope you may want to complete all sections, we only ‘require’ you to complete sections 1 to 4: and then you are automatically included in the prize draw for a £50 voucher (we hope you will also complete the rest). Note it is section 4 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 address:

Tel:
Fax:
Email:

3. Classification Category: *(Please choose one or more of the classifications above which best reflects your example – e.g. policies for teaching – how do these explicitly encourage or discourage the link)*

4. What does the department do? *(e.g. the specific ways in which staff are recruited/organised so as to maximise the links include... Please ensure this section is written such that departments elsewhere can take the central elements from your practice. Write it like a 'good' cook book!). There is word limit to this section. But for entry to the prize draw this section needs to be a minimum of 500 words.*

5. Hot tips and things to look out for: *(What is the key advice you would give someone who has decided to adapt this method /procedure/way of organising and so on?)*

6. Does it work? *(In your view what are its strengths, areas less effective etc? Has it been internally/externally reviewed and if so what were the central 'observations'?)*

7. What problems/issues have arisen?

8. Details of support material *(perhaps attach as a separate file any details that you think would help others; e.g. relevant sections of appraisal documents)*

9. Relevant references *(to published articles / web sites by you or others that describe this way of organising the department)*
