

LTSN Generic Centre

Linking Research and Teaching in Departments

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Preface

This guide is a timely contribution to the debate about the relationship between research and teaching, given the current review of research assessment being conducted by the UK funding bodies. The Learning and Teaching Support Network believes that securing positive synergies between research and teaching can and should be one aim of higher education policy. This view is held in common with partner bodies such as the Institute for Learning and Teaching in Higher Education. This guide argues that positive relationships may be created between research and teaching but that they do not necessarily occur automatically.

This guide arises from the LTSN Generic Centre project entitled Linking Research and Teaching in the Disciplines. It aims to give departmental leaders, teaching and research staff, and educational developers, ideas, examples and guidance based on research evidence and experience. In addition subject specific examples and resources are available on the LTSN Generic Centre project web pages (www.ltsn.ac.uk/genericcentre > Projects > Research and Scholarship > Linking Research and Teaching). Contributions are also included from the LTSN Subject Centres working as partners in this project.

Issue 3 of *Exchange* magazine (Autumn 2002) contains a range of articles focussed on linking research and teaching more generally in higher education. It is available to download from www.exchange.ac.uk.

I hope that you find this guide useful, both as a catalyst for reflection and as a practical resource.

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Summary

This guide is aimed in particular at:

- Departmental Leaders
- Educational Developers
- Teaching and Research staff

It explores the effective links between teaching and research in academic departments.

The central arguments are:

- a. that the 'teaching/research nexus' is central to higher education
- b. that the linkage is not automatic and has to be developed
- c. that academic departments are central to developing the linkages between research in the discipline and student learning.

Suggestions are offered as to how departments can strengthen the good practice that already exists. Departments are invited to work with the LTSN Subject Centre relevant to their discipline, and a national project funded through the LTSN Generic Centre (see appendix 1), to strengthen the teaching research nexus in their departments and disciplinary communities.

1. Scope, Origins and Purpose

"We are all researchers now ...teaching and research are becoming even 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 (2002). *A lot to learn: we are all researchers now*. Guardian Education. 8 January p13

"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 as part of the Fundamental Review of Research*

We are seeking to enhance the link between research in the discipline (e.g. history) or interdisciplinary subjects (e.g. environmental studies) with student learning in and through those disciplines. This linkage is what Neumann (1994) has called the 'teaching/research nexus.' While much of what we suggest is relevant to the growing number of taught postgraduate courses, our central concern is with the undergraduate level. The undergraduate curriculum is central to most institutions and departments, and is where research clearly shows that the relationship is most problematic. Our focus here is not primarily on linking teaching with research on teaching and learning in higher education, (including research on discipline based pedagogy (Yorke, 2000). Our concern is with

the long standing and central issue of the relationship between staff involvement in research in their discipline and their role as teachers of that discipline (or where appropriate in interdisciplinary or multidisciplinary contexts).

It is important to emphasise that our collective understanding of some of these issues, particularly how teaching/research relations are enacted in and through disciplinary communities and departments, are still developing. So the ideas presented here need to be critically appraised.

We hope that this guide will encourage you to develop and disseminate your experience and ideas for effective practice through your disciplinary community.

2. The Central Role of Academic Departments

Our organisational focus is on the department as that is where teaching and research are most clearly organised and immediately resourced. Clark (1993 and 1997) in his discussion of the integration of research activities with teaching and learning, sees the institution as formative, that is setting a general context and strategies in which teaching/research relations are developed. However, the key enactment is at department level, where disciplinary communities also reside and are organised. As disciplines shape both the nature of pedagogy and of research, discussions of departmental policy and practices need to recognise and value the practises and cultures of the disciplines. This is not to neglect other levels, as this guide subsequently points out. Other publications consider strategies for creating the teaching/research nexus from the level of the individual academic and course team, through the roles of departments, institutions and national systems (Jenkins et al., 2002; Zetter, 2002a), and how institutional teaching strategies can enhance this link (Gibbs, forthcoming).

In addition, issue 3 of *Exchange* magazine is devoted to a range of strategies and perspectives on the link (Healey and Jenkins, 2002).

Clearly departments vary in size, resources and culture. We offer no simple 'how to do it manual' as the issues are complex and there is no one solution. What we offer is a review of the large research and scholarly literature and its policy implications; and we outline a range of strategies that you can adapt to your context. But before considering these possible strategies we need to review the research evidence on teaching/research relations, as this introduces the key issues that departmental policies need to address. In particular, the research evidence shows that the nexus is not automatic and, if desired, needs to be purposely created.

3. Valuing the Teaching/Research Nexus

“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 and as the intellectual level of work done rises.”

Committee on Higher Education (1963). The Robbins Report CMND 2154, paragraph 555.

This quotation from the Robbins Report of 1963 on the then future of UK higher education, expresses the strong cultural value of, what we would now term, the teaching/research nexus as a central objective of the nature and purpose of higher education. This value was reinforced in the recent Dearing Report, albeit in a context where research was seen as central to economic prosperity, and needed to be selectively concentrated. Partly through a visit to the USA, Dearing was “persuaded ... of the important role of research and scholarship in informing and enhancing teaching” (NCIHE, 1997 p 8); and he recognised that “there is a near universal rejection of the idea that some institutions of higher education should be teaching-only institutions” (ibid. p11).

The importance of students being able to understand and to an extent do research is now arguably of increased importance than in the times of the Robbins Report. Barnett (2000 p163) has argued that universities need to be reformulated to help students and society deal with supercomplexity: students’ understanding of knowledge generation through research (and perhaps their ability to do research) is vital to that objective. Many contend that the new knowledge economy requires that students graduate with an ability to analyse and contribute to research (Garrick and Rhodes, 2000; Zetter, 2002b p 6 and see section 8 below). In a knowledge society, how knowledge is developed (i.e. researched understanding) and transmitted (i.e. taught

and learned) is critical: this is what we understand to be the meaning of the research/teaching (and learning) nexus. For academic staff, forging productive links between teaching and research helps them to better manage what otherwise can be conflicting demands on limited time. While for department managers, focussing on the link can help in ensuring productive linkages between staff roles across the department and greater efficiency in delivering a range of departmental activities. For those departments with limited access to external research funds, developing the teaching/research nexus can help to support a research profile. For strong research departments ensuring the link can help students appreciate the value to them of this departmental research focus.

In summary as Zetter suggests, the value of the link can be expressed in terms of three perspectives

1. Experientially - as a process which benefits students and staff
2. Conceptually - in terms of societal needs and the development and communication of knowledge
3. Operationally - in terms of the reciprocity of teaching and research as learning activities. (Zetter, 2002b).

In seeking to build the linkages we need to recognise and act on the research in this area which warns us that the linkages are not automatic and indeed are problematic. These challenges are now considered.

4. The Research Evidence Summarised

If we turn to the large research literature on teaching/research relations much of it would question that classic connection.

The conceptual challenge, as Boyer and colleagues (1990) powerfully argued in their seminal work over a decade ago, lies not in distinguishing between teaching and research, with the traditional polarity which this implies, but in seeking the synergy between these two academic activities.

They offer a now widely respected typology of scholarship, a preferred term to teaching and research.

They identify the scholarships of

- discovery (advancing knowledge)
- integration (synthesizing knowledge)
- service (advancing and applying knowledge)
- teaching (advancing and applying knowledge about how to teach and promote learning).

Boyer's argument is that these forms of scholarship are complementary and interactive not hierarchical and distinct areas of activity. An academic may engage these modes in different ways and at different times. A number of significant and widely cited publications have subsequently informed the debate.

Moving from concept to practice, there is extensive research literature which has examined, particularly at the level of the individual but also the course team and the departmental levels, the (statistical) relations between (measures of) research output/quality and teaching quality (e.g. Pascarella and Terenzini, 1991). In a meta-analysis of this research, Hattie and Marsh (1996 p 529) argued that "the common belief that teaching and research were

inextricably intertwined is an enduring myth". They concluded, as we do, that "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" (ibid. p 533).

Recent research by Marsh and Hattie (2002, p 614) at a large urban university in Australia with both teaching and research orientations, has further confirmed the view that "teaching effectiveness and research productivity are nearly uncorrelated, thus supporting the hypothesis that they are independent constructs." (ibid. p 635). The main policy implication they draw from this highly detailed and rigorous study confirms the approach of this publication: "Perhaps the major implication of this study is that it may be of most value to ask institutions how they could re-weight research and teaching within institutions and departments. A major aim would be to increase the relations between teaching and research and devise strategies to achieve this mission." (ibid. p 634).

Some recent research, often using different research methodologies than the research summarised by Hattie and Marsh (1996), and developed by Marsh and Hattie (2002), does support those of us who argue for the importance of the teaching-research nexus. This research directs our attention to a) focus on the student experience and course design, b) focus on institutional and department organisation and c) focus on disciplinary concerns. Drawing out the implications of this research, has helped us develop specific suggestions for departmental policies to enhance the nexus.

5. Focus on the Student Experience and Course Design

In a seminal article reviewing the research literature on teaching/research relations available then, Brew and Boud (1995 p 261) argued 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”. They concluded that one way to achieve this link is to “exploit further the link between teaching and research in the design of courses” (ibid. p 272). Recent research including that by Zamorski (2000) on students and staff at the University of East Anglia, and on students in a range of disciplines at Oxford Brookes University (Jenkins et al. 1998; Lindsay et al. 2002), provide evidence that students perceive clear (potential) benefits from (staff) research. Paradoxically much of this

research shifts the implications for policy and practice away from staff as researchers towards students as learners. Thus Elton (2001 p 43) argues that “a positive research and teaching link primarily depends on the nature of the students learning experiences, resulting from appropriate teaching and learning processes”. Figure 1 below suggests how individuals and course teams can seek to design courses in light of this recent research.

Linking Research and Teaching in Departments

Figure 1: Strategies for linking teaching and research at the level of the module/course at undergraduate/postgraduate level. Based on Jenkins et al. (2002) and Zetter (2001).

Strategies for linking teaching and research at the level of the module/course at undergraduate and postgraduate level
<p>Develop students' understanding of the role of research in their discipline</p> <ul style="list-style-type: none">• Develop the curriculum to bring out current or previous research developments in the discipline.• Develop the curriculum to bring out, incrementally, the way the core concepts, knowledge and practices of the discipline have developed through research.• Develop student awareness of learning from staff involvement in research.• Develop student understanding of how research is organised, commissioned and funded in the discipline/institution.
<p>Develop students' abilities to carry out research in their discipline</p> <ul style="list-style-type: none">• Develop the curriculum, in particular how students learn, in ways that mirror or support the research processes in the discipline.• Assess students in ways that mirror or support the research 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/skills/knowledge, perhaps using the students' own social world in the university for them to research, and collect and analyse data.• Develop student involvement in staff research by inviting students to staff seminars.• Re-run research projects as teaching and learning tools for students to validate research design, methods, data sets and to rework analysis and reporting.• Critique staff publications from research perspective; ask students to design their own methodology – problem based learning.• Provide students with a dissertation topic list which, appropriate to their level of study, interacts with current staff research projects.• Ask staff to present their research in research methods courses in terms of 'how did you research this issue?'; 'what were the problems?'. Ask students to critique the approach.• Ensure that the dissertation component of a degree is supported by a research training tool kit clearly articulated and embedded from preceding course modules/units.
<p>Privilege research opportunities to selected students</p> <ul style="list-style-type: none">• In the USA, which has long operated a mass higher education system, student involvement in research with staff is mainly or only offered to those with high grades/motivation.
<p>Manage student experience of staff research</p> <ul style="list-style-type: none">• Limit the negative consequences for students of staff involvement in research. 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.• Evaluate/research the student experience of research and feed that back into the curriculum.• Support students in making clear to them the employability elements of research. 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.

6. Focus on Institutional and Departmental Organisation, Policies and Culture

In the UK, while there are strong correlations between Research Assessment Exercise (RAE) scores and Teaching Quality Assessment (TQA) / Quality Assurance Agency (QAA) scores, there are questions here of causation and the role of resources and research prestige affecting teaching quality scores (Drennan, 2001). If we look to the USA we need to note the criticism of the influential Boyer Commission that "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" (University of Stony Brook, 1998 p 3). Their criticism is of institutions and departments failing to ensure linkage, in particular through the way that institutions and departments value research at the expense of teaching, and failing to ensure that (undergraduate) students benefit from departmental research. This too was a central theme in Boyer's influential *Scholarship Reconsidered*, with its call to "break out of the teaching versus research debate" (Boyer, 1990 p xii).

Research by Zamorski at the University of East Anglia revealed that "while students value being close to research...there are many ways in which they feel excluded" (Zamorski, 2000 p 1). Similar perspectives came from student focus groups at Oxford Brookes University (Jenkins et al 1998; Lindsay et al 2002). Mirroring the US experience, there is now increasing research evidence that in the UK the pressures for research selectivity, in particular the RAE is having the unintended consequence of driving teaching and research structurally

apart (Elton, 2000; Jenkins, 1995; McNay, 1999; JM Consulting 2000).

Here a recent US experience is particularly relevant to those of us who seek to preserve or perhaps rather to reshape universities and departments, and to ensure that the link is central to the student and staff experience of higher education. Building on his own work and that of colleagues, Boyer (1990) and the University of Stony Brook (1998) called for ten key changes in undergraduate education, four of which directly call for organisational changes to strengthen 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 characterise the whole of a research university education.

4. 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.

Stimulated by this and related critiques, many American universities and departments are initiating structures and policies to better ensure students benefit from institutional and department resources for research. Such initiatives have been supported by organisations such as the Carnegie Foundation for the Advancement of Teaching and the American Association for Higher Education.

The importance of departmental organisation and culture has been a central feature of our experience in Project LINK (see appendix two). In seeking to strengthen the nexus, we started by focussing on issues of course design. Informed, in part, by a range of department based focus groups with staff in the four institutions involved in the FDTL project we quickly learned that we needed to direct much of our attention to issues of departmental (and institutional) organisation and culture (see later discussion).

7. Focus on Disciplinary Concerns

Given that staff identify with their discipline, and given the power of national and international disciplinary communities, there are pragmatic reasons for national and departmental strategies, which seek to develop good practice through staff commitment to their discipline (Healey and Jenkins, in press). In addition, a range of recent research studies has clearly indicated that the form of the teaching/research relationships and the possible ways of enhancing the nexus varies by discipline. This is a powerful theme in Neumann's (1993) study of senior staff in a major Australian university, Rowland's (1996) study of department heads at Sheffield University, and Robertson and

Bond's (2001) study at the University of Canterbury (New Zealand) of staff perceptions of teaching/research relationships.

Disciplines carry out and teach aspects of their research in different ways. In some of the sciences much research is done in project teams e.g. in laboratory enquiries, and students may be able to play important if subsidiary roles in such research teams. There are also significant differences in the ways that disciplines conceive the nature of research. For example, in the humanities, the boundaries between research, scholarship and teaching are seen as much more fluid and complementary. There are also important disciplinary differences in the

use to which research is put. For example, in health sciences and medicine, the role of evidence based research in underpinning and examining professional practice, needs to be central to both the pursuit and funding of research and its role in the curriculum. In addition, in these disciplines much teaching is done informally e.g. on hospital wards, so shifting the conceptions of teaching and research and how they might be linked (McKee, 2002).

In Project LINK, we have found the work of scholars such as Gibbons et al. (1994), very valuable, especially in the vocational and applied disciplines like planning and estate management with which the project deals. Their view that much knowledge and research is developed and used in application, and the increased importance of what they term 'Mode 2 knowledge', has shaped our work in advising on curricula for professional disciplines such as estate management and planning. Our assessment is that these debates, and their relevance to the nexus, have a much broader application than our specific disciplines.

In a knowledge society, research is context specific and multidisciplinary rather than pure and discipline based; it has social relevance rather than being hypothesis led; it uses fuzzy, rather than empirically based data; it is problem solving rather than deductive. In what might be termed the commodification of knowledge, how knowledge is managed, synthesised and adapted become as important as knowledge itself. This requires not only a familiarity with the traditional academic

researcher skills such as rigorous methods of inquiry and verification, but new skills, above all in organising the deployment of knowledge in practical situations and using a knowledge base to derive solutions to new problems, rather than advancing the internalising world of knowledge itself.

Employers will increasingly demand that graduates have the skills to conduct appropriate research, the capacity to formulate solutions to problems based on awareness of research evidence, and the ability to critically assess that evidence: in other words knowledge creation and use (Zetter 2002b p6).

Whether such perspectives are valuable to other disciplines and, more importantly which research and pedagogic perspectives are useful to particular disciplines, are questions being addressed by the LTSN Generic Centre project entitled Linking Teaching and Research in the Disciplines. As disciplinary communities we have much to learn about the nature of the links and relationships between teaching and research, and how they can be effectively linked in our specific disciplines. Those centrally involved in this Generic Centre project have also benefited from seminar discussions with the project adviser Angela Brew of the University of Sydney. In particular, the project has been shaped by Brew's (1999 and 2001) perspective that the potential links between teaching and research can be better connected when academics see research as a process of enquiry and teaching constructed as a joint exploration between staff and students.

Linking Research and Teaching in Departments

Brew's work and insights in part mirror the ideas developed in Bowden and Marton's (1998) formulation of the 'University of Learning'. Bowden and Marton also point to issues of funding and organisation. In particular they argue that the traditional conception of the "university in terms of the conjunction between teaching and research goes back to the traditional European university with a professor surrounded by a small pack of disciples ... the traditional professor was the conjunction between teaching and research. But the traditional professor is not around any more. During this century the number of students has increased exponentially, and the size of staff has not grown in proportion (ibid. p 6). They argue, as do Brew and Boud (1995) that the way forward is to conceive research and teaching (and the university's role in the community), in terms of a process of learning. Then the policy implications include how to structure and organise the university, including academic departments, to ensure effective linkages between these forms of learning – rather than focusing on linking teaching and research at the level of the individual academic.

To conclude this policy orientated review of research, one of the most useful policy research studies is that by Colbeck (1998). Revealingly entitled "Merging in a Seamless Blend", this is a detailed study of the extent to which discipline and departmental/ institutional cultures and policies support or hinder staff in integrating their teaching and research roles in a seamless blend. Colbeck studied English and Physics from two

contrasting US universities; one a high prestige research university and the other, a Masters level University. In English the linkage was stronger with respect to the content of the curriculum. In physics the link lay more in the process of inquiry and the involvement of undergraduate and postgraduate students in staff led research projects. Colbeck's research (ibid.) also showed that departmental working practices, culture and policies significantly shaped both the possibilities for staff to see positive relationships between their involvement in research and their teaching, and the motivation to forge such links. For example, at the high prestige university what counted for research funding and promotion was high level, original 'discovery research' which was not necessarily connected to teaching. Paradoxically, it was at the less well research funded lower level institution that staff saw stronger possibilities for linking teaching and research. At this particular institution, writing student textbooks and computer software etc. could count for departmental appraisal and tenure as research. Or to express that differently in the language of Boyer (1990), this department was widening the conception of scholarship to include the 'scholarship of integration' as well as the 'scholarship of discovery'. In those departments regardless of academic discipline, staff saw their academic lives as more clearly merging into a seamless blend.

8. A Link to the Policy Suggestions

Up to this point we have emphasised that

- a key feature of a university is the effective integration of teaching and research
- the key potential role of a department in supporting the nexus
- research evidence contends that such a positive relationship is not automatic and, if desired, needs to be designed.

We have also shown that existing research gives us some clear directions for action, including the need to recognise and value the importance of the peculiar practices of the disciplines. We also repeat our recognition that we may be simply making more explicit the good practice that already exists. However, we also assert that as disciplinary communities we have much to learn, and certainly much to share, about teaching/research relations in our discipline.

What follows is a range of strategies, developed by colleagues worldwide, which grow out of this research evidence. We do caution that their (potential) impacts have been little researched. As academics we have spent long professing, but we have researched limited aspects of this relationship. Thus there are many research studies at the level of the individual academic but few at the level of the department, institution and national system. We agree with Hattie and Marsh (1996) that as academics we need to progress the nexus, and that could include you researching the impact of the following strategies we suggest and others you devise!

9. Policy and Practice Suggestions for Departments

Our suggestions are organised through five key strategies. In addition there is a list of possible (departmental) strategies, together with details on their implementation on the LTSN Generic Centre website:

www.ltsn.ac.uk/genericcentre > Projects > Research & Scholarship > Linking Research & Teaching.

Strategies:

1. Develop Departmental and Disciplinary Understanding
2. Review Current Practice and Culture
3. Develop Staffing Policies
4. Integrate Policies and Structures for Teaching and Research
5. Suggested Specific Questions to Consider

Strategy 1: Develop Departmental and Disciplinary Understanding

Central to embedding the nexus is the need to support staff in the department both in understanding the complexities of the nexus, and in owning a shared conception or conceptions of the nexus. As we have indicated above, these issues are complex, and often we initially approach them from strong preconceptions. Generic understanding of the issues need to be complemented by an understanding of teaching/research relations in those disciplines in the department, and then progressed through discussions and decisions as to what is appropriate to particular departments and institutions. A useful model is the study of how different departments in three contrasting Australian institutions have developed what they see as appropriate conceptions of the nexus to their particular and contrasting institutions (Zubrick et al. 2001).

Such discussions can be prompted by departmental seminars, away days and publications. Clearly, such meetings benefit from brief articles or websites that act as effective triggers for discussion.

Thought then needs to be given to how to lead these discussions into policy and actions. Perhaps the key actions are by individuals and course teams as they apply this understanding to designing courses. Alternatively, does this contention underplay the importance of applying understanding to research and teaching policies?

Strategy 2: Review Current Practice and Culture

Departments have established cultures, practices and policies, which are both formal and informal. In developing and strengthening the nexus, one place to start is to review what is already in place or perceived to be in place. Such reviews could include:

- Evaluating the student experience and perceptions of teaching/research relations for the courses taught in the department and then sharing these findings across the department;
- Investigating how academic and support staff perceive the relationships in the department, and how they consider they could be strengthened;
- Audit and review current courses on how they currently develop the link, identifying areas where there is good practice to guide others and what, if any, problems or issues need to be addressed. Such reviews might concentrate on particular types of courses for example, year one courses or those concerned with research training. From such reviews one can then move to developing department policies and projects to strengthen the nexus.

Figure 2: Case study: Developing research based education in Health Care. Source: Jenkins et al. 2002; Appleton and Foxcroft, 2002.

Case study: Developing research based education in Health Care

The School of Health Care Studies at Oxford Brookes University undertook a comprehensive review of all its courses (and associated staffing) to strengthen how students; a) understood health care practice as evidence/research based, b) could themselves understand the nature of, and to an extent, carry out research and c) in particular, ensure that students were informed consumers of research in the way that they practised professionally; through developing skills in critical appraisal and developing research skills in interpreting and applying knowledge, based on research evidence.

Strategies to strengthen the nexus included:

- Establishing a Research Education Steering Group to inform a proactive and strategic approach to the implementation of a spiral curriculum for research;
- Reviewing and, where necessary, revising all courses in terms of their current practice in evidence based health care, with particular attention to reviewing their current learning outcomes and related assessment strategies and a 'research skills audit' of all courses in terms of whether particular research skills were taught, practised and assessed in particular modules;
- Requiring that all fields/course teams develop a strand of education for evidence based practice through all programmes;
- Developing a common dissertation requirement and specification for all multi professional programmes;
- Providing staff training and support to develop a core of staff with expertise in research education to teach the research training courses and lead in the supervision of student dissertations;
- Monitoring practice and policy through the steering group when these tasks had been completed 18 months later.

<http://www.brookes.ac.uk/virtual/NewTF/tn/tnfeb2002.html> (17.12.02)

Strategy 3: Develop Staffing Policies

As briefly discussed in the above case study, the skills, knowledge and roles of staff are central to supporting or obstructing the link. In most institutions it is at department level that staff are hired and their work organised. This is one central reason why Clark (1993) sees the academic department as the level where the nexus is 'enacted' (or not!). Specific strategies that departments can develop include:

- Strategically decide as a department whether you expect all/most staff to be centrally involved in both teaching and research. In part this may depend on whether you believe (as many still do) that the best researchers are the best teachers – or vice versa. In our view a tight coupling between teaching and research qualities does not concur with either the anecdotal evidence or the research evidence. Nor does a tight coupling of teaching and research at the level of the individual academic recognise that different teaching skills are needed to effectively teach say large introductory courses or supervise undergraduate dissertations. We suspect that whatever one's beliefs as to what is desirable such a tight coupling will only be possible in selected research rich departments. In many departments the nexus may pragmatically be seen as occurring in the student experience of the course and supported by overall staffing policies, in which individual staff take on more specialist roles, but roles that are designed to support the nexus.
- Especially important here may be the way teams are convened to conduct teaching and research. Often this is on the basis of delivering specific parts of the programme curriculum based perhaps on subjects, courses, projects etc. but some, if not all members of these teams often conduct research in related areas. Teams might be obliged to deploy their staff in such a way that the team's research work is delivered in taught programmes, but not necessarily by those whose exclusive or central role is research.
- Recognise and support staff who wish to change such roles through time, as long as such changed roles support overall department objectives.
- Make the nexus a central consideration in hiring new staff. This could involve ensuring that such staff have strong commitment and skill for both teaching and research; or in the case of more specialist roles, using selection procedures that in part focus on how candidates propose to support the link from their specialist role.
- Make the nexus central or intrinsic to role description and workload planning. Here specific policies will vary greatly between strong research based departments, where it may well be required of all staff that they be active in both research and teaching; and departments outside the research elite. It may well be that in some departments, role descriptions and workload planning will mean that some staff have much of their time allocated to teaching and others to research. If so, and if the nexus is really valued, then such policies and practices need in part to focus on

ensuring that such specialist roles and work allocations support the link. If the department focuses the link on the student experience of the course (see previous discussion on the research evidence), then specialist roles can be defined in terms of how they support the nexus. For example, certain staff may have much of their time allocated to research. But such research will be clearly shaped to support the curriculum, and such research staff may take on key roles in overall curriculum design and their research materials may be central to selected courses. Again, the role of research-teaching teams discussed above is relevant here.

- Paradoxically in some departments, perhaps particularly the research based departments, the nexus will be supported by ensuring that teaching is highly valued, but a conception of teaching that is research based.
- Make the nexus central to role descriptions for leadership positions including professorial roles.
- In many departments, particularly those outside the research elite, the departmental focus may need to be on supporting all staff to be scholars in their discipline and in the teaching of their discipline. Here we need to share and develop effective procedures for staff to provide evidence (for example, through appraisal and promotion) that they are involved in current discussions and controversies in research in their discipline. As a community we need to consider, and share with and across the disciplinary communities, the evidence for scholarship and how departmental and national frameworks can support that scholarship (Gordon et al. in press).

Strategy 4: Integrate Policies and Structures for Teaching and Research.

"We found little evidence to suggest that synergies between teaching and research were managed or promoted at departmental or institutional level"

JM Consulting, 2000 p 36

This quotation encapsulates a central conclusion of a research study conducted for HEFCE as part of the 2000 Fundamental Review of Research. Similarly, a study of UK departments of history, chemistry, engineering and business studies concluded that:

"If teaching and research are as inseparable as many participants claimed, the lack of explicit strategies to promote this synergy is interesting. The discussions with heads of department and other managers of staff time indicated that on a managerial level, it is more convenient for teaching and research to be treated as separate activities. On an intellectual level, however, academic managers would rather perceive the two to be synergistic. What seems to be missing is an intellectual perception of teaching and research as integrated. For example, we visited many departments where Research Committees and Teaching Committees had been established, but these two bodies worked independently of each other."

Coate et al., 2001 p162.

Developing policies and structures to support the nexus specific strategies to adapt include

- Review/revise the current teaching strategy in terms of the extent to which it explicitly relates to and supports the research strategy
- Review/revise the current research strategy in terms of the extent to which it explicitly relates to and supports the teaching strategy
- Consider the elements of these strategies which could be explicitly made one common strategy or project
- Review policies for sabbaticals and research leave for the extent to which they support the nexus
- Where specialist research centres or units exist, review the extent to which they relate to and support the postgraduate and the undergraduate curriculum and whether and how such linkages could be strengthened
- Particularly, but not exclusively in the sciences, review how laboratories, equipment, space allocation, technical support and library, support the nexus.

Strategy 5: Some Specific Questions to Consider

Drawing on research and scholarly literature, and our experience so far (in both the LTSN Generic Centre project and the FDTL Project LINK), we offer these questions for a department seeking to progress the link (Zetter, 2002a, 2002c). We too are still considering them in our departments.

Curriculum and Research based Learning

- What is your departmental (and disciplinary) understanding or conception of research based or informed learning?
- What forms of pedagogy and their assessment do you consider appropriate to support these conceptions?
- Can you clearly identify where research based learning is integrated in the programme?
- Where is current research in your field presented in the programme? Check your
 - programme design and programme outcomes
 - curriculum content and delivery in the modules
 - assessment methods.
- Where are research methods/skills/ethics taught and practiced? Is this progressive? Is a variety of appropriate skills/methods delivered?
- Is the research knowledge/skills the student will have acquired made clear in the module learning outcomes?
- Can/do students participate in departmental research projects as, for example, research assistants?

Linking Research and Teaching in Departments

- Where is the scope for students to conduct independent research in their programmes and in what ways do the programmes allow progression?
- How are research skills and the links between teaching and research embedded in monitoring and review of modules and programmes?
- How are students supported in making explicit how this research training/knowledge supports their employability?
- How are undergraduate students made aware of postgraduate research opportunities?

Management, Organisational Structure and Staffing at Departmental Level

- How does the department's learning and teaching strategy articulate research and teaching/learning links?
- How does the department's research strategy articulate teaching and research/learning links?
- How are the teaching and research activities, organised, motivated and resourced? Are they managed for mutual engagement? Are (all) researchers involved in teaching? How are non-research active teaching staff mentored and encouraged to develop a research/scholarly profile, and valued for their particular contributions to the nexus?
 - How do research teams and course teaching teams link with each other? How are these links facilitated?
 - Are research clusters also teaching teams?

- How are teaching staff managed in developing research and/or scholarly capacity and vice versa?
- How are new staff inducted into the department values and practices?
- How are incoming students acculturated into the department values and practices?
- How is the staff and student experience of the nexus monitored and the results fed back into policies and practices?

Inclusive Culture

Developing the links between teaching and research requires cultural change too.

- What are the mechanisms for disseminating and communicating research outputs and teaching practice development in the department?
- How is the research culture and activity given visibility to students? How do students come into contact with departmental research?
- What are the strategies to disseminate research based teaching experience from the module level?
- What profile is given to (discipline based) pedagogic research? How is this research disseminated and applied in programmes?

And finally

- Allow for diversity.
- Remember it is the individual's scholarly engagement with her/his subject and how this is brought to their teaching and research setting which mediates the relationship between teaching and research. You cannot tightly programme the nexus.
- Recognise that the relationship between teaching and research is reciprocal.

10. Conclusion

We are convinced that re-shaping our departments in a way that better focus on the nexus can aid student learning, staff morale, their pride in their department and the overall effectiveness of the department and the institution. To repeat earlier cautions, we are convinced from the research evidence and our own experience that the linkage has to be created. The nexus does not necessarily occur naturally; indeed much of immediate current practice and policy in the UK threatens the nexus. The disciplinary groups within departments and at national level have key roles to play in creating the links.

We know that embedded in departments there is much good practice to build on and from which others can learn. We realise full well that we have only been able to share a minute portion of that here. However, we are

also well aware that we all have much to learn to better support that nexus, and the form in which the nexus develops should and will vary by disciplinary, departmental and institutional contexts. As a national system and as disciplinary communities we have only just embarked on developing our understanding and sharing good practice in strengthening the nexus. Yet for many, perhaps most of us, the teaching/research nexus in varied forms lies at the heart of higher education. We hope this guide will support departments in reflecting and building on their current practice, and sharing it with others with the support of their LTSN Subject Centre and the LTSN Generic Centre.

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Appendix 1

Linking Teaching and Research in the Disciplines

www.ltsn.ac.uk/genericcentre > Projects > Research & Scholarship > Linking Research & Teaching

Key Actions and Deliverables

This national project for the Learning and Teaching Support Network (LTSN) Generic Centre involves

1. Exploring how to embed teaching/research links in disciplinary communities.
2. Creation of generic support materials to help further embed teaching/research links in disciplinary communities.
3. Developing support materials including web pages with
 - links to international projects on the teaching/research nexus
 - a guide to support departments to make strong linkages between research and teaching
 - a range of workshop materials for others to adapt.
4. Initially involving five LTSN Subject Centres embedding teaching/research links in their disciplinary communities.
5. Providing a framework, ideas and strategies to support other LTSN Subject Centres in developing such links.

Initially the project is for the period January 2002 to September 2003.

While the project is directed to identifying and disseminating good practice, it also recognises that as disciplinary communities and academic institutions we have much to learn about both the nature of the links in our communities, and how best to strengthen those that are effective. The project is thus directed both at tangible deliverables and developing processes that support our understanding.

The specific actions and deliverables by the initial five LTSN Subject Centres are:

LTSN Bioscience

- Development of a dedicated section of the LTSN Bioscience website containing
 - Case studies of effective practice in linking teaching and research in the Biosciences.
 - An annotated bibliography on teaching/research links in the Biosciences.
 - A short review on teaching/research links in the Biosciences.
 - A digest of the Bioscience QAA Benchmark statement and those for Agriculture, Forestry, Agricultural Sciences, Food Sciences and Consumer Sciences to illustrate areas where teaching and research are or should be linked.
 - Links to relevant websites.
- Development of a workshop session, which will offer guidance, resources, discussion and exchange of ideas about linking teaching and research in Bioscience departments. The session will be presented within the LTSN Bioscience Events Calendar and on request from departments.

LTSN Geography, Earth and Environmental Sciences (GEES)

- Develop dedicated pages of the GEES website
- Prepare an annotated bibliography
- Collect, edit and publish at least 20 case studies
- Organise a national conference (June 30/July 1, 2003)
- Prepare a review essay
- Publish a special edition of Planet (bi-annual magazine/journal).

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LTSN Health Sciences and Practice
A dedicated section of the Subject Centre website, containing

- A report mapping current links between teaching and research in Health Sciences. The map will reflect what teachers claim they do when linking teaching and research in classroom and placement settings.
- Document reporting on teacher evaluations of current practice in linking teaching and research. The teacher perspective will illuminate the purposes and conditions of linking teaching and research.
- Four detailed ethnographic case studies, each of approx. 6000-10000 words. The case studies will highlight the student, teacher and institutional perspectives in linking teaching and research. They will be drawn from different disciplines in Health Sciences and reflect different teaching contexts. Further dissemination will include; an article for Exchange Magazine, evidence-based practice in health sciences, conference paper and journal article.

LTSN Hospitality, Leisure, Sport and Tourism

- A "Learning Resource Guide on Linking Teaching and Research" in our disciplines aimed at departments, course teams and individual staff.
- Summary outline findings of a focus group session of staff perception and issues.
- Target of 12 case study examples; 3 from each of Hospitality, Leisure, Sport, Tourism
- Two detailed case study research projects - one from the staff perspective and one from the student perspective.

We will also promote the topic via subject based events, LINK our newsletter, and our guide to current practice.

LTSN Centre for Legal Education (UKCLE)

- Dedicated section of UKCLE website with links and examples.
- Bibliography relating to linking teaching and research in legal education.
- Survey of current practice on linking teaching and research within legal education.
- Case study template developed in the light of review of current practice.
- 10 case studies on linking teaching and research in legal education.
- Project themes introduced and discussed at four UKCLE events.

The project hopes to extend its subject base as it develops. LTSN Medicine and English Subject Centres are now also developing sub-projects to complement those listed above.

Appendix 2

LINK – FDTL 3 Project
www.brookes.ac.uk/LINK

Project LINK is a three-year project (2000-3) to further embed teaching/research links in three built environment disciplines - planning, land management and construction. It is funded by the Fund for the Development of Teaching and Learning (Phase 3). The collaborative partners are the School of Planning, Oxford Brookes University (project leader), University of West of England, University of Westminster, Sheffield Hallam University, and a range of cascade partners.

The authors would like to acknowledge the assistance of Dr Bridget Durning, Project Manager of LINK in the production of this guide.

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With Rosanna Breen (now at Cambridge University) and Roger Lindsay at Oxford Brookes University he has researched student perceptions of staff research at undergraduate and postgraduate level. Their book 'Re-shaping Teaching in Higher Education; Linking Teaching and Research' was published in 2002 by Kogan Page and the Staff and Educational Development Association (SEDA). Alan has a university wide role at Oxford Brookes University to promote teaching and research linkages and is adviser to the FDTL 3 Project entitled LINK, entitled 'Linking Teaching, Research and Consultancy in Built Environment Disciplines' (<http://www.brookes.ac.uk/LINK>). He is also managing a LTSN Generic Centre project on 'Linking Teaching and Research in the Disciplines' (www.ltsn.ac.uk/genericcentre > projects > research & scholarship).

Professor Roger Zetter is Deputy Head of Planning at Oxford Brookes University and Director of the FDTL 3 Project LINK (2000-3), on 'Linking Teaching and Research in Built Environment Disciplines' (<http://www.brookes.ac.uk/LINK>.) His main teaching, research and consultancy interest is focused on the political, policy and managerial issues raised by humanitarian assistance to asylum seekers and refugees, including humanitarian assistance. He has published extensively in this field and has directed many projects and consultancy assignments for governments, intergovernmental organisations and non-governmental organisations. Current research projects include: Economic and Social Research Council (ESRC), Refugee community based organisations: a social capital approach; European Union, Refugee integration in Europe; Home Office, Asylum seeker reception policies in Europe, and Dispersal of asylum seekers in the UK.

He also teaches and researches issues of urbanisation and planning in the developing world, including education and training. Forthcoming books include Planning Cities: Growth and Sustainability in the Developing World (IT Publications November 2002) and From Welfare to Market Economy: The State, Aid and Policy in Urban Development and Shelter Programmes (Earthscan 2003).

The Learning and Teaching Support Network Generic Centre

Assessment, widening participation, e-learning, employability - these are just some of the issues which concern everyone in higher education today. No one person or institution has all the answers, and yet plenty of answers are out there. Within the UK's higher education institutions there are some excellent learning and teaching practices. Many of these practices are common to a number of subject disciplines and are easily transferable. The LTSN Generic Centre aims to broker this expertise and promote effective practices in learning and teaching across all disciplines.

The Generic Centre team is just one part of the much larger Learning and Teaching Support Network (LTSN). This larger network includes 24 Subject Centres whose role it is to address learning and teaching issues specific to their subject areas.

To find out more visit our website at www.ltsn.ac.uk/genericcentre

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