THE RELATIONSHIPS BETWEEN RESEARCH AND TEACHING IN HIGHER EDUCATION - A REVIEW OF THE LITERATURE (1990-2002)

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2004

Occasional Paper - No 2

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Abstract

The aim of this paper is to answer the question what do we know about relationships between research and teaching in higher education? This is not a new debate and is not exclusive to the UK. However, the debate is of considerable relevance to individuals and institutions in this sector.

The literature review focused upon four leading UK higher education journals: Higher Education, Higher Education Quarterly, Higher Education Review and Studies in Higher Education (all issues from 1990 to 2002 were reviewed).

The conclusions are as follows. There are relationships between research and learning, rather than research and teaching. It is necessary to think in terms of research processes, as well as, research content informing student learning. The relationships between research and learning are dependent upon context. Rather than a single relationship, there are relationships, which are dynamic rather than static. Conclusions are also drawn in terms of policy implications and areas meriting further research.

Key Words: Research, Teaching, Learning and Scholarship

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Acknowledgements

I thank the Faculty for Education and Sport for making this review possible through an internal funding bid, Steve Creffield for preliminary work, Oxford Brookes University for the helpful resources available on their website and Professor Tom Bourner for reviewing an earlier draft of this paper.

This occasional paper is an updated and condensed version of a report produced in September 2001. The views expressed in this paper are my own and are presented here in order promote debate.

Introduction

This section introduces the debate about relationships between research and teaching and how this literature review contributes to the debate in terms of its aims, key terms, scope and contents.

The Debate Ramsden and Moses (1992:273) have suggested "few beliefs in the academic world command more passionate allegiance than the opinion that teaching and research are harmonious and mutually beneficial." Whilst, Ramsden and Moses are very sceptical about such an allegiance the quotation highlights the centrality of the debate to the work of universities. Debates about the relationship between research and teaching are neither new nor exclusive to the UK. The origins of the debate may be traced back to Humboldt (see Moses, 1990; Elton, 1992 and Clark, 1993 for a more detailed discussion of the historical origins of the debate).

> Such binding together of teaching and learning by means of research is very much what Wilhelm von Humboldt had in mind as part of his 1810 doctrine…For Humboldt had the gall to say right out that the university does not exist primarily for students, or even for faculty (Clark, 1993:302).

Whilst Humboldt was writing with reference to Germany, the debate has caught the academic imagination around the world (OECD, 1981). At a crude level the debate revolves around the question is there a relationship between research and teaching? However, as this literature review will demonstrate, there are likely to be relationships rather than a relationship between research and teaching, and these relationships are likely to be highly context specific. At its most polarised and caricatured the two camps may be represented as follows.

In one camp are those who believe that you cannot have quality teaching without quality research. The research may be carried out by the academic delivering the teaching or by researchers in close proximity (for example the same Department or Faculty). In the other camp are those who believe that the research and teaching relationship is emphasised to safeguard the vested interests of those involved in research. They would argue that research is not a pre-requisite of teaching quality and sometimes even suggest that it may have a negative impact upon teaching quality. Shore et al (1990:22) cite Webster (1984) suggesting an "extreme" form of this view.

> We find it more fun, more exciting, more rewarding, and less constraining … we argue that we should do research not for real reasons but for one that is more acceptable to the students, parents and legislators who indirectly pay our salaries – the possibly spurious reason that our research will enhance our teaching.

Whilst the literature review will reveal more subtle positions it is worthwhile considering in general terms potential forms the relationships between research and teaching may take.

Although, the representativeness of the findings of Jensen (1988) may be questioned (see for example Ramsden and Moses, 1992:277) he provides examples of forms the relationship may take and in particular the two way interplay of research and teaching.

Positive effects of research on teaching

- Teachers keep up to date on new methodological approaches and on current developments in the discipline, which are of theoretical or applied significance.

Positive effects of teaching on research

- Researchers maintain an awareness of the discipline as a whole, aiding conceptualisation of narrower research topics.
- Researchers are stimulated by new students' interests and questions.

Negative effects of research on teaching

- Research diverts attention away from teaching duties (contact with students).

Negative effects of teaching on research

- Teachers rarely take up new areas of research.

So far the debate has been caricatured and potential interplays identified, which raises the question why should the debate be taken seriously? The debate has implications in terms of funding, organisation, staff and students.

If research does inform teaching and more specifically have a positive impact upon the quality of teaching then this may be used as an argument for increasing the funding of research. If the opposite is true then there may be a case for diverting funding from research to teaching. Similarly, relationships between teaching and research have implications in terms of the organisation of Universities and their Departments. Evidence of a positive relationship between research and teaching would suggest the need to locate research and teaching closely together, whereas no relationship (or a negative relationship) would support the notion of research-only and teaching-only institutions. In the early nineties with the ending of the binary divide there were fears of a "…potentially damaging division of institutions of higher education into research universities and teaching universities (Elton, 1992:263). Although, Moses (1990:351) notes that research and teaching employment categories have been separated in Sweden and many U.S. universities.

As well as the institutional implications of the debate there are implications for individuals. For academic staff the relationship has implications for promotion, remuneration and work allocation. For students the relationship has implications about where they study. In the context of Australia, Ramsden and Moses (1992:294) have warned undergraduate students about choosing courses based purely upon the quality of research.

In reviewing the literature relating to relationships between research and teaching, the consensus has been that there is little empirical evidence to support the assertions about research and teaching relationships.

Table 1 – Questioning the Relationship between Research and Teaching

The lack of findings is "due to a gross oversimplification of the way that the problem is usually formulated…" (Elton, 1986:299)
"…That nearly every conclusion about the compatibility between research and teaching within the British and Australian systems has been reached entirely through anecdote and informal observation." (Ramsden and Moses, 1992:276)
"…White says that 55 per cent of the studies she looked at contained "irregular" remarks – statements that overemphasised the importance of the relationship between research productivity and teaching effectiveness, even when the results did not indicate such an association." (Ramsden and Moses, 1992:277 citing White, 1986)
"Investigations of the links between teaching and research, of which there have been a large number, have failed to establish the nature of the connection between the two or, indeed, whether there is one. It is not that results are conflicting but they are inconclusive." (Brew and Boud, 1995:261)
"Much of the research literature questions the positive impact of staff research on quality teaching." (Jenkins et al, 1998:128)

There is a paradox here that despite the lack of empirical evidence "passionate allegiance" to the existence of a relationship between research and teaching remains.
Brew and Boud (1995:261) suggest that the fact that further studies continue to be undertaken suggest an unwillingness to accept that there is very little correlation between teaching and research. They (1995:262) cite Centra (1983) and Neumann (1992) suggesting, "the belief that there is a link is stronger than present evidence for the link."

In the conclusions of this paper, the concern of Elton (1986:299) cited above, that the problem has been oversimplified to the detriment of understanding will be restated. However, first it is necessary to explore more deeply what is known about teaching and research relationships.

The Aims of the Literature Review This literature review aims to answer the following substantial question:

What do we know about relationships between teaching and research in higher education?

The conclusions to this paper answer the following questions.

- What can we learn from this literature review?
- What are the policy implications of this literature review?
- What further research does this literature review suggest?

It is intended that answers to these questions will be relevant to staff involved in research and/or teaching, staff involved in developing policies relating to research and teaching and staff involved in illustrating relationships between research and teaching to external audiences (for example quality visits and validation visits).

It is necessary to acknowledge caveats about the literature in this area. The problem is that often researchers are not comparing similar research findings, in trying to establish evidence about the relationship between research and teaching (contextualising the debate).

However, the problems encountered in reviewing the literature relating to research and teaching is broader than just this relationship. Blaxter et al (1998:313) noted the absence of "departments of higher education in our universities" and also that "for many academics, an interest in researching higher education would either be seen as navel gazing or simply bizarre." The implication is that more emphasis upon systematically researching higher education is required.

Key Terms and Scope Brew and Boud (1995: 263) note that "in studies of the relationship between teaching and research, there is a notable absence of any debate about what research is and what is teaching. They tend to be taken as given."

Definition of Teaching

The only teaching, which is valuable, is, of course, that which leads to effective learning. There is now a body of literature about learning which is suggestive of good teaching so we would now wish to define good teaching taking account of what has been said about student learning. (Brew and Boud, 1995:266)

The suggestion here is that in considering how research informs teaching the goal should be student learning, teaching cannot be considered in isolation from what is learnt. This definition is favoured in this paper, although much of the literature reviewed utilises an ambiguous conception of teaching (the distinction between teaching and learning is revisited in the conclusions).

Definition of Research

There may be good reasons for avoiding a definition of what is research? Particularly given the different types of research philosophies and academic disciplines. However, completely avoiding defining a key term is neither good research nor good teaching. Brew and Boud (1995:267) cite Brew (1988).

Research is a process of learning. Indeed research is the process whereby much learning proceeds. This is as true of the three year old discovering the garden for the first time as for the analytical chemist or the quantum physicist in their sophisticated laboratories. Research is learning. This is almost a truism; it's obvious.

Therefore "research as a process of learning" is the favoured definition of research for this paper. This is contrary to much of the literature about research and teaching relationships, which argues that the content of research can inform the content of teaching. For example, a researcher researching small group processes may draw upon the content of her/his research into small group processes. However, as well as, utilising this research content, in undertaking this research the researcher is engaging in research processes. For example, a researcher may learn about participant observation through using this method to research small group processes and then she/he may draw upon this tacit knowledge when supervising a student project. This may be critically summarised as "in stressing outputs in knowledge production (research) and transmission (teaching), products are valued more than processes" (Brew and Boud, 1995:268). The main although not exclusive focus of the literature reviewing was four leading UK HE journals:

Higher Education,
Higher Education Quarterly,
Higher Education Review,
Studies in Higher Education.

These particular journals were chosen because "they are, arguably the most prestigious specialist journals for those academics writing on higher education that are seeking to publish, and be read, in the United Kingdom" (Tight, 1999:28). All issues from 1990 to 2002 (inclusive) were reviewed. These journals deal with issues across the HE Sector. There was a case for reviewing discipline specific journals for example the

British Journal of Management. However, to review the journal output of all the major academic disciplines would have been overwhelming. Also, it would have been difficult to draw comparisons between findings from very different discipline areas. Whilst the importance of academic context is emphasised throughout this paper, the goal is to discover some generic insights into research and learning.

Contents of the Paper

The next section highlights the range of variables, which may influence research and teaching relationships, as an informed understanding of research and teaching relationships needs to address the specific and changing context in which research and teaching are undertaken. Subsequent sections explore the debate from three different perspectives: student, academic and institutional. Whilst, there are inevitably overlaps between these perspectives, it is beneficial to understand the debate from the perspective of different stakeholders. A separate section is devoted to scholarship, which has been identified as a potential mediator between research and teaching. Also, the explicit policy prescriptions arising out of the literature reviewing are identified. The main findings arising out of the paper are summarised before conclusions are drawn in terms of the aims of the literature review.

Contextualising the Debate

"…Relationships between teaching and research are dynamic and context driven" (Brew, 1999:296).

This quotation is significant on a number of levels. Firstly, rather than searching for evidence about the relationship between research and teaching it acknowledges that there will be different relationships between research and teaching. These relationships will change over time, for example in the article; Brew illustrates how epistemological changes impact upon the relationships. Also, relationships will be dependent upon a range of contextual factors. Table 2 identifies contextual factors, which may impact upon relationships between research and teaching.

Table 2 – Contextual Factors

Research
I) Type of Research ii) Level of Research iii) Academic Discipline
Teaching
I) Mode of Delivery ii) Learning Philosophy iii) Academic Discipline
Academic
I) Teaching Role ii) Scholarship Role iii) Research Role
Student
I) Level of Ability ii) Level of Study
University
I) Type ii) Strategy
National
I) National Culture ii) Politics

Table 2 illustrates a range of contextual factors, which impact upon relationships between research and teaching. This listing is not exhaustive as there will be further contextual factors, for example demographic factors relating both to academics and students.

However, Table 2 does challenge the assumption that there is a universal relationship between research and teaching in higher education. As the first two contextual factors suggest, research and teaching will take many different forms, particularly in terms of different types of research and different modes of delivering teaching (workshop, lecture, seminar etc).

Also, there is a considerable diversity in terms of the roles of academic and student. Each academic will have a different mix of teaching, scholarship and research to undertake. Whilst, students share the common activity of study, they differ in many ways, such as the prior knowledge they bring to their studies and the levels at which they study (such as undergraduate and postgraduate).

As well as these individual factors there are institutional contextual factors. Many different types of institution with different histories and cultures are now known as universities. These institutions have

different strategies for research and teaching. Finally at a national level, government policy will impact upon research and teaching, as well as, more generally national cultures.

All of the above factors have the potential to influence relationships between research and teaching. Understanding these relationships is further complicated by interactions between these factors and changes over time.

In contextualising the debate a concern emerges that we are not comparing like with like. Whilst, Table 1 highlights the lack of conclusive evidence about a relationship between research and teaching, Table 2 suggests the discovery of such a relationship may apply only in the specific context being reported. For example, can conclusive empirical evidence about a relationship between research and teaching on a chemistry undergraduate course in Australia be generalised to a postgraduate business course in the UK?

Certainly, there is a tendency in the literature about research and teaching relationships not to acknowledge the contextual factors. This leads to a reification of the research and teaching relationship. This situation is rectified in the work published towards the end of the nineties, particularly through the writings of Brew.

Student Perspectives

In terms of the relationships between research and teaching Hughes and Tight (1995:51) caricatures the "ideal" situation as "Students are seen as short-changed if they are not learning from a lecturer working at the frontiers of knowledge…"
This quotation raises the question how do students perceive research and teaching?
This section focuses upon papers by: Jenkins et al (1998), Breen and Lindsay (1999), Ramsden and Moses (1992) and Hughes and Tight (1995).

Students are well placed to comment upon how research informs teaching although, relatively little work, in comparison to academic and institutional perspectives, appears to have been undertaken. Jenkins et al (1998) present a research study into teaching and research relationships using focus groups of undergraduate students from a range of disciplines in one institution. Table 3 presents illustrative quotations from these focus groups.

Table 3 – Student Focus Group Quotations

… Without people doing research, I mean it's almost dead in a way.
If someone is paid to be here and teach, that is what they should be doing … but presumably university staff are also paid some time to be spent on research.
You're looking at your own lecturers, their research, and then you think you're in a good institution.
I feel cross when I sit in a lecture, their research may be great, but they can't teach…

This qualitative data reminds us that research may impact upon teaching either positively or negatively. Also, the quotations suggest that students in the same institution studying similar courses may perceive the relationship between research and teaching in very different ways. A good example of this was the experiences of business management students.

Thus, business management (Year 1) students perceived knowledge in their field as being real-life know-how and deriving from practice. Research should be done in a university but probably not by their teachers! (Jenkins et al, 1998:132)

Across all disciplines, and particularly noticed by year three students, were four central disadvantages of staff undertaking research:

- staff were not available to students;
- they seemed preoccupied with their research at the expense of teaching;
- in certain cases, staff research could have too great an influence on the curriculum; and finally,
- students did not perceive themselves as "stakeholders" in staff research. (Jenkins et al, 1998:133)

The paper also identifies advantages of staff research which include; staff research also gave them credibility in the eyes of the student, staff research also to an extent gives credibility – in student eyes – to their degree and to the department/university in which they are studying (Jenkins et al, 1998:133). In this study research and scholarship of staff appears to have been perceived as synonymous.

Jenkins et al (1998:139) summarise their research as follows "…we think we have established that, from a student perspective, there is a teaching-research nexus that is largely positive, while the main adverse impacts can, in part, be resolved through effective management."

Breen and Lindsay (1999:75) investigated the relationship between student perceptions of lecturer research and motivation to study at university.

… It is suggested that previously reported negative evaluations of research-active teachers might come from a subpopulation of students who are extrinsically motivated and uninterested in communication with lecturers. (Breen and Lindsay, 1999:75)

This research encourages awareness about the different ways in which students may perceive research in the context of their learning and more specifically again differences amongst students. Breen and Lindsay (1999:87) found that "the data indicate that there are clear associations between what motivates students and how they perceive research." Brew (1999: 298) suggested that "if researchers recognise the ways in which their activities parallel those of students and take steps to involve students in research–like activities, research can inform practice in facilitating learning." In this spirit, Winn (1995) and Goodlad (1998) have published accounts of examples of how students learnt first-hand about research by undertaking "real" research.

Whilst, the above studies were positive about teaching and research relationships, Ramsden and Moses (1992) were more sceptical. Ramsden and Moses (1992:291) suggested that their "results offer little or no foundation for a belief in the existence of a positive causal relationship between effective undergraduate teaching and high levels of research activity in Australian higher education." Subsequent research findings (Breen and Lindsay, 1999:90) about student's perceptions of research may explain these findings (see above).

Another way of approaching the student experience of research and teaching is in terms of teaching and research quality assessments, specifically addressing the question are the highest quality research departments also the highest quality teaching departments? Ramsden and Moses (1992:275) have described a view, although not their own "…that there is no need separately to measure, or reward, teaching effectiveness. Research prowess can stand as valid proxy for teaching quality." If this were the case it would have considerable significance for institutions and individuals.

Hughes and Tight (1995:60) reviewed the research and teaching assessments for four subjects: chemistry, history, mechanical engineering and law published in the Times Higher Educational Supplement (1994). They found a strong positive relationship between research and teaching excellence for each of the subject areas featured.

They suggest that there are a number of possible explanations for this apparent relationship:

- Excellent research is feeding into excellent teaching, and/or vice-versa;
- Departments which have been successful in the research assessment exercises have applied the lessons learned to the teaching assessment exercise;
- Departments are not generally perceived by assessors as being excellent at just one function, but as excellent overall.

Jenkins et al (1998:128) similarly note "the strong correlation at a departmental level between the grades in the Research Assessment Exercise and grades for teaching quality in the Teaching Quality Assessment. Interestingly they suggest that such a correlation maybe "…a product of another variable such as resources…" not mentioned by the Warwick University academics. These "possible" explanations offer insights into the politics surrounding the quality assessments, it is important to remember that their findings were based upon historic data and a few disciplines. More pointedly Hughes and Tight (1995:61) warn that.

What we may be witnessing in these two exercises, taken together, is a reification of the perceived connections between research and teaching in the university. Thus reinforced, this connection becomes a self-fulfilling prophecy.

The warning is about perceiving a mutually beneficial relationship between teaching and research for staff within universities, regardless of discipline or specific contextual factors.

Academic Perspectives

The following section focuses in particular upon papers by Shore et al (1990): Brew and Boud (1995) and Court (1999).

Shore et al (1990) interviewed active researchers about their research and teaching.
They highlight an unresolved issue that affects potential research and teaching links in terms of the degree to which the goals of one are related to the goals of the other "the primary goal of research is to ask questions and create new knowledge. Students spent a lot of time answering questions and mastering old knowledge" (Shore et al, 1990:33). This aside is interesting in that it warns that in seeking a relationship between research and teaching we may not be comparing similar activities. The final paragraph of the conclusions offers an effective summary of their findings.

The evidence we have collected largely contradicts the belief that research and teaching inform directly upon each other. The relationship remains to be explored in other ways, perhaps more sensitive to differences not explored here, and in other environments. (Shore et al, 1990:34)

Brew and Boud (1995:268) also acknowledge that the relationship between teaching and research can never be satisfactorily demonstrated. However, they are more positive than Shore et al and emphasise the importance of learning in the equation.

Learning however is the vital link between research and teaching. It is a shared process in these two enterprises…Teaching and research are correlated where they are co-related, i.e. When what is being related are two aspects of the same activity: learning!

The relationship is between learning and research, rather than teaching and research as so often previously configured (the predominance of research and teaching is evident in the titles of papers reviewed for this paper). An important behavioural consequence of emphasising learning is that "through the personal learning and growing in which they engage that researchers are able to identify with their students" (Brew and Boud, 1995:270).

This observation helps to make sense of papers sceptical about the relationship between research and teaching. Barnett (1992:623) asserted "knowledge in the context of discovery and knowledge in the context of transmission are entirely different enterprises". Brew and Boud would probably agree with Barnett's assertion. However, if you think of research as a learning process and the process of student learning, then they share the common ground of discovery.

Similarly, Westergaard (1990:27) reflects, "…higher education must, for students no less than for staff, be investigative and exploratory, sceptical and critical." Again in this quotation the common ground between separate activities of research and teaching is the learning.

Court (1999:65) offers an interesting perspective on the debate from his position as an employee of the Association of University Teachers, finding that there is consensus that the emphasis on research in determining careers has gone too far (Court, 1999:65). The survey that Court undertook was based on a self–report questionnaire of 561 academic respondents. The respondents were asked to indicate their level of agreement with a series of statements. He provides detailed information about the composition of his sample, which does appear to reflect the diversity of the UK academic community. In particular there is a balance of academics from pre 1992 and 1992 institutions.

[Statement One] - "Appointments at my institution place too much emphasis on research"- More than half the respondents agreed or agreed strongly with this statement.
[Statement Six] - "Promotion at my institution now places too much emphasis on research" - Slightly more than half the respondents agreed or agreed strongly with this statement.

While the author is able to substantiate (with empirical evidence) his hunch that research is overemphasised in terms of academic career progression he remains pragmatic in his conclusion that "… it seems unlikely that there will be a significant shift in the culture of higher education away from the research imperative, whether institutions have a strong or weak tradition" (Court, 1999:86). He concludes his paper on a very poignant note.

Staff assigned more teaching and administration or other tasks because their research profile is modest or non-existent – as envisaged by the Dearing Report – will find it hard not to feel second-class citizens in the more differentiated higher education of the future. (Court, 1999:87)

Whilst the research of Court does not directly explore the relationship between research and teaching his findings are very relevant to our understanding of the academic perspectives. There may well be a silent majority of academics that remain doubtful about a relationship between research and teaching. Assessments such as the Research Assessment Exercise may polarise such a situation.

The RAE has the potential of explicitly rewarding (intrinsically and extrinsically) research for the research active, and causing other activities being perceived as non- rewarding (Talib, 2002:58)

This leads to consideration about institutional perspectives on relationships between research and teaching.

Institutional Perspectives

It is quite difficult to differentiate between academic and institutional perspectives. However given the strategic significance of institutional perspectives they are explored separately here. The section focuses upon papers by Davies and Glaister (1995); Neumann (1992); Hughes and Tight (1995); Brew and Boud (1995); Moses (1990) and Barnett (1992).

The mission statements of UK universities provide insights into institutional pronouncements on research and teaching. Davies and Glaister (1995:281) in introducing their content analysis of UK university mission statements, note that this analysis "…is fraught with difficulties, not least in identifying suitable criteria and minimising subjectivity." In terms of the relative emphasis given in the mission statements to research and teaching they found the following (282).

About sixty-one per cent of the mission statements (forty-two in total) gave approximately equal weighting to teaching and research, with a greater teaching emphasis in about thirty-two per cent of the mission statements (twenty-two in total) with most of these mission statements coming from the "new" universities. Only about three per cent of the mission statements emphasised research more than teaching (two in total) these being mission statements from the old universities.

Davies and Glaister (1995:281) further developed their content analysis by carrying out a key word analysis, finding that some key words appeared in over forty per cent of the mission statements (quality; teaching; research; community; students; international).

Neumann (1992) researched the perceptions that senior academic administrators hold on the relationship between the research and teaching components of academic work. The interview discussions revealed multiple, positive and bi-directional links between the teaching and research areas of academic work Three broad types of connection were distinguished:

- The tangible connection relates to the transmission of advanced knowledge and the most recent facts.
- The intangible connection relates (a) to the development in students of an approach and attitude towards knowledge, and (b) provides a stimulating and rejuvenating milieu for academics.
- The global connection describes the interaction between teaching and research at the departmental and not just individual level.

These three types of connection are not necessarily separate, clearly distinguishable or delineated connections, they interrelate and intermingle (Neumann, 1992:162).

While, acknowledging that the research-teaching nexus exists at both postgraduate and undergraduate level, Neumann (1992:167) is able to identify variations.
Postgraduate teaching/supervision believed to be impossible without an academic actively pursuing his or her own research, since the rate at which knowledge changes, as well as the critical, questioning stance required of a researcher, necessitate a supervisor who has an active, personal research involvement.
Neumann (1992:167) acknowledges that the teaching-research nexus at the undergraduate level "…is quite complex" with the nexus influenced by a variety of factors:

- The nature of the discipline,
- The type of course,
- The motivation of the student,
- And the intellectual ability of the student.

A significant proportion of those interviewed argued that it is important for active researchers to be teaching at first year undergraduate level. This is the time to captivate students for the "intellectual enterprise" and to motivate them to go on to postgraduate work. Since the benefits to students from the teaching-research nexus are cumulative, it is therefore important to teach from the very beginning critical and questioning skills and to give students some vision of what is possible. While this view was supported by the research it was acknowledged, "…this does not always occur" (Neumann, 1992:167).

Whilst, Neumann (1992) conceptualised the research and teaching relationship in terms of three connections, Hughes and Tight (1995: 53 & 62) in a thoughtful piece based upon the literature identified five alternative relationships:

- No necessary relation;
- Direct relationship;
- Indirect relationship mediated through scholarship;
- Indirect relationship mediated through the department, discipline or profession rather than the individual;
- Indirect linkage between research and teaching mediated through development activities.

Brew and Boud (1995:261) believe that a common element shared by teaching and research is a concern for learning. If this is correct it has implications for institutions as well as individuals. In their conclusions, they (271) identify areas for further research in line with the arguments developed in their paper.

There is a need for work to be done to explore the relationship between the research process and academic learning. How can studies of researchers as experienced learners help us understand the promotion of deep approaches to learning? What is the relationship between the way in which a researcher synthesises ideas in a research field and the process of creating meaning carried out by an individual learner, i.e. differences between expert and novice learners in a given domain?

The work of Brew and Boud is refreshingly different from those studies that attempt to link research and teaching. Part of their message is what we can learn about learning by looking at the ways in which researchers operate. Moses (1990:352) has challenged the dominant ideology in universities, and not only Australian ones (OECD, 1981) that in all disciplines teaching and research benefit each other.

- That without the notion of "scholarship" the debate about research and teaching functions will cause more confusion and misconceptions than clarification of the issues.
- That disciplinary cultures and conventions influence the conceptions of both research and scholarship.
- That these differences need to become part of decision-makers' and academics mind-set.

In understanding how the nature of teaching and research relationships may be dependent upon disciplines, the categorisation of law as a discipline is a useful example of disciplinary differences (Moses, 1990:358).

Practical expertise is often valued more highly than theoretical knowledge and is reflected in recruitment practices, when applicants with professional know-how but no doctorate or research may be selected. This does apply to law.

On one level this view appears to be a generalisation, however Moses is comparing law with chemistry, engineering and English and so the position will consequently be polarised. The implication here is that comparing research/teaching in one faculty of a university with another is of dubious validity. The nature of any relationship between research and teaching appears dependent upon the discipline.

In drawing her conclusions Moses (1990:373) spells out practical implications of ignoring disciplinary differences in terms of the research/teaching relationship.

Staff in all departments recognize that there are high performers in their midst and low performers, and that high performance of all staff needs to be encouraged. What they do not understand is when the standards of one discipline are taken and applied to all in promotion and tenure decisions.

Moses believes that university wide promotion systems, which place equal emphasis upon research regardless of understanding the academic disciplines involved, are misconceived and will be perceived as unfair by staff (this assertion appears to be supported by the findings of Court 1999 cited earlier).

Barnett (1992:622) rather than reporting research into the relationship between research and teaching takes a critical overview of the debate, offering what he refers to as broad-brush sociological observations.

- A significant element of research is not only funded by the government, or quasi-governmental agencies, but also organized on a customer-contract basis.
- This form of research endeavour can all too easily produce a state of alienation in those conducting the research.
- Research is largely uncontrolled by democratic means even though it is directed by state agencies.
- Research is increasingly conducted outside institutions of higher education.

These observations warn us about the dangers of generalizing about teaching and research relationships; there are no generalities in terms of either research or teaching.

Barnett (1992:623) develops an argument, which emphasises the importance of teaching in delivering higher education "…knowledge in the context of discovery and knowledge in the context of transmission are entirely different enterprises." He expands upon this dichotomy in terms of six theses.

Table 4 – Six Theses about Research and H.E. (Barnett, 1992)

First Thesis: Research is public; higher education is private.
Second Thesis: Research is a matter of outcome; higher education is a matter of process.
Third Thesis: In higher education, learning is intended; in research, it is a by-product.
Fourth Thesis: Higher education is open: research is closed.
Fifth Thesis: Research is a necessary but not a sufficient ingredient for higher education.
Sixth Thesis: The academic community is directly related to research but indirectly related to higher education.

Whilst, Barnett, (1992:636) has acknowledged that research and higher education seem so inseparable that they are almost synonymous, Table 4 encourages reflection upon six ways in which research and H.E. are not synonymous. Barnett (1992:636) concludes his paper as follows.

A genuine higher education today cannot be offered entirely separately from some kind of research base. But that does not mean that either institutions of higher education or their staffs are obliged to conduct research.

The position of Barnett (1992) may be paraphrased, as those who do the research do not necessarily need to do the teaching. In essence discovery and delivery of knowledge may be divided. But what about scholarship, if teachers do not need to do the research themselves do they need to undertake their own scholarship?

Scholarship

In reviewing the literature relating to research and teaching relationships a number of authors (e.g. Elton, 1986 and 1992, Moses, 1990; Westergaard; 1991; Hughes and Tight, 1995) have emphasised the importance of scholarship. This section draws particularly upon the work of Elton (1986 and 1992) in order to explain the potential mediating role of scholarship in teaching and research relationships. Elton (1992:253) states that scholarship can broadly be characterised "as consisting of new and critical interpretations of what is already known…an activity that is necessary as a precondition for both good research and good teaching."

The conclusion to which I am driven is that universities are in principle active in three fields – teaching, scholarship and research – but that only in the humanities and not in the sciences is scholarship dignified with the title "research". (Elton, 1986:301)

Elton (1992:252) argues that scholarship must be recognised and separately funded.
Although, stressing that teaching, scholarship and research should not be thought of as clearly separable activities (253). He (256) also discusses how the emphasis upon scholarship may vary, dependent upon the discipline.

There remains the question as to whether there are disciplines in which research consists essentially of interpretation, so that scholarship is research. The claim is usually made on behalf of the humanities, but it might be argued that it is equally applicable to, for example, theoretical physics, where for instance Einstein's work might be said to constitute a reinterpretation of existing knowledge and not the discovery of new knowledge.

Elton seeks to encourage debate about the need to fund and support scholarship, which will then inform teaching and research. He argues this might be the best way forward for the ex-polytechnics whom at the time of his paper were almost entirely funded for their teaching.

In terms of research, teaching and scholarship, Elton (1986:302) describes scholarship as "…the tenderest plant, since it is never the prime purpose of an institution." This is evidenced in the work of Davies and Glaister (1995) cited earlier – that research and teaching were both very prominent in university mission statements, but scholarship did not feature.

Policy Prescriptions

Authors of papers featured in this literature review often sought to influence policy. This is an interesting goal in itself, which generously may be described as an "action research" orientation or more sceptically as "self interest". However, it is worth acknowledging an anomaly highlighted by Coate et al (2001:172) that "the day- to- day management of academic departments are often based on systems that treat teaching and research as distinct activities." Whilst, policy prescriptions need to be understood with reference to the authors overall findings (discussed in previous sections). The aim here is to highlight their policy suggestions. Brew (1999:296) believes "…the ways in which we think about academic activities of teaching and research are being influenced by the context of critical debates about the nature of knowledge." This leads Brew (298) to warn that:

By treating different facets of the academic enterprise as conceptually distinct, we have created a vast chasm to cross…The chasm is thus, I would argue, a function of the ways in which teaching and research have been viewed.

Brew and Boud (1995:272) in emphasising "learning" as the common ground between what we traditionally think of as "research" and "teaching" suggest the following policy implications of their work:

Should we not, for example, exploit further the link between learning and research in the design of courses? Perhaps there is more we can learn about learning by looking at the ways in which researchers operate. For example, learning could perhaps become more collaborative, more problem-centred or more self and peer-directed than is presently the case. Whether we look from the research angle or the teaching angle, learning provides the link, which is capable of adding new vitality to the debate.

Long appears to share a similar position to Brew and Boud in her advancement of the notion of research as living knowledge "learners want to discover living knowledge and not just a listing of unassimilated facts or a quantity of stored knowledge. Learners need to meet people in who knowledge is alive" (Long, 1994:48). In a similar manner, Shore et al (1990:23) quote the famous Beveridge (1957) assertion that researchers remain students all their lives. Whilst, this does not suggest a direct causal link between research and teaching it does suggest teaching may benefit from researchers empathising with their students.

Also, Elton (1992:253) notes that teaching; scholarship and research should not be thought of as clearly separable activities. The policy implication here is that rather than trying to identify the "relationship" between teaching and research and then organise accordingly a different approach is required.

An approach that acknowledges that there will be many varied relationships between research, teaching and scholarship and that these relationships will vary over time. He suggests allowances for scholarship as follows:

Hence a reasonable figure to allow for scholarship in all activities might be 10 per cent of the total budget of higher education, to cover all its institutions and not only universities. This would amount on average to perhaps half a day per week of staff time in a normal working week or alternatively a sabbatical term about every three years. Since scholarship should be a duty of all who teach and all who research in higher education, this time allowance should be given to all academic staff, but would have to be properly accounted for at annual appraisals, so as to prevent misuse. (Elton, 1992:265)

In terms of increasing emphasis upon assessing teaching and research quality this appears to be a tangible means of making a difference. However, the notion that "scholarship should be a duty" is likely to work against scholarship being separately supported. Brew (1999:300) advocates in depth studies in order to elucidate the different kinds of complex relationship between research and teaching.

By helping universities to understand many varieties of ways in which the relationship is negotiated and maintained, such studies will inform their decision-making as they live with, and, as Barnett (1997) hopes, even come to revel in, this context of uncertainty.

In Table 5 creative suggestions for mechanisms for encouraging linkage through the joint development of teaching and research are offered (Hughes and Tight, 1995:63):

Table 5 – Joint Developments of Teaching and Research (Hughes and Tight, 1995)

Acknowledging the contribution which students make to academics' work through their literature searches, field data, dissertations, and work and life experience.
Being more strategic in organising student project work around existing or developing staff research interests.
Seeking and valuing the contributions of students in developing research methodology and analysis through their involvement in work-in-progress seminars.
Considering how research and teaching might be linked through external organisations, such as through students' actual or potential employers, who could provide venues for developing research skills.

In making these suggestions Hughes and Tight (1995:63) note that these developmental linkages may be most appropriate for postgraduates or final year undergraduates and similarly, developments may be most appropriate for those in or with recent experience of employment. These suggestions show how research and teaching may be mutually beneficial, rather than antagonistic.

Table 6 presents the findings of Jenkins et al (1998:136) about student perspectives on staff research suggesting that there are policy messages here for all higher education institutions where undergraduate teaching is meant to be enhanced (and certainly not diminished) by staff research.

Table 6 – Policy Messages for Undergraduate Teaching (Jenkins et al, 1998)

Staff absence from the institution and lack of availability to students need to be managed in order to ensure that they do not affect students too adversely.
Students should have opportunities to benefit from research and from their staff involvement in research.
Institutions and subject groups should be required to monitor and identify how their research policy impacts on and supports the undergraduate curriculum.
Institutions and, in particular, departments/subject groups should inform and perhaps involve students in staff research.
Subject groups, when designing their curricula should consider how that curriculum could integrate (staff) research to benefit student learning.
The (potential) teaching ability of staff needs to be a key concern at appointment, initial training, appraisal and promotion, but these procedures should also recognise how staff incorporate their research into their teaching.

In Table 6 the institutional policies which could be undertaken to ensure that students benefit from the relationships between research and teaching are highlighted (see also Lindsay et al, 2002) for a further development of these ideas.

Policies need to differentiate between different academic disciplines in a university.
Moses (1990:373) found that relationships between teaching and research could be influenced by discipline differences, leading her to emphasise the need for different forms of support.

This means for Chemistry and Engineering academics in the college sector, for example, that conference and travel money is available, that postgraduate programs are established, staff-student seminars initiated. For the Humanities and Social Sciences it means adequate and expanding library resources.

Whilst, such a recommendation appears sensible it is likely that universities allocate resources to different faculties in a similar manner in order that resource allocation will be perceived to be fair.

The above policy implications have been based upon the Mose's positive perceptions about relationships between research and teaching. Ramsden and Moses (1992:293) who did not find causal relations between effective undergraduate teaching and high levels of research activity in Australian higher education suggest very different policy implications, which may be summarised as follows.

- Allowing research performance to act as a surrogate for teaching performance, for example in appointments, is unsupportable.
- Any general increase in research funding to institutions, which have hitherto pursued little research, cannot be expected automatically to enhance their teaching effectiveness.
- Undergraduate students who select their programmes of study in the belief that high status, highly selective, highly productive research departments will provide the best teaching may be making a mistake.

An implication of these research findings is the differentiation of careers for researchers and lecturers. However, Elton (1986) cites the OECD (1981) warning against this for the following reasons.

- It creates a stratification of first – and second-class citizens;
- It leads to a loss of quality in teaching;
- It creates an institutional split between teaching and research institutions;
- Research institutions are unstable because of their dependency on a country's changing research and development budget and policy.

In considering research and teaching relationships there is a sense of either looking back or reviewing present arrangements. However, "as students grow in number and knowledge steadily expands, the basic units of universities have to be creatively re-organized. In that reorganization the idea of a research-teaching-study nexus should be a guiding concept" (Clark, 1993:313). This understated quotation shifts the emphasis away from the slightly philosophical question about is there a relationship towards the more practical concern about how greater alignment between research and teaching may be a response to future challenges. Long (1994:52) warns us about an automated future without "living knowledge".

A well-programmed robot will soon be able to generate bibliographies, organise and stratify them around thematic clusters, identify evidence to suit a pre-programmed logical file, string this evidence together using dialectical method consisting of arguments for and against a hypothesis, develop these points in keeping with a coherent grammar and eventually adopt a number of writing styles appropriate to the environment of the research findings.

The impact of such developments will vary dependent upon the academic discipline. In the natural sciences where objectivity is emphasised the above development may be welcomed, whereas in the social sciences, which also embrace subjectivity, the development may be undesirable. Long's discussion about research appears to embrace scholarship. Research in terms of conceiving a project, designing a project, obtaining funding and recruiting staff appears less amenable to automation. However, this quotation warns that the traditionally intangible nature of research is becoming more tangible.

Summary

The intention with this summary is to draw together some of the arguments for and against linking research and teaching. It selectively summarises the paper in terms of positive and negative relationships between research and teaching. The structure is based upon the findings of Jensen (1988) cited earlier. This structure differs from the paper, which was based upon the perspectives of different stakeholders. This summary and a broader reservation of the paper, relates to grouping together research findings from very different contexts (national, institutional, discipline etc). In this summary only findings based upon original empirical work are included.

Table 7 - Positive Effects of Research on Teaching

…Without people doing research, I mean it's almost dead in a way. (Student cited in Jenkins et al, 1998)
You're looking at your own lecturers, their research, and then you think you are in a good institution. (Student cited in Jenkins et al, 1998)
Staff research also gave them credibility in the eyes of the student. (Jenkins et al, 1998:133)
Staff research also to an extent gives credibility – in student eyes – to their degree and to the department/university in which they are studying (Jenkins et al, 1998:133).
Winn (1995) and Goodlad (1998) have published accounts of examples of how students learnt first-hand about research by undertaking "real" research.
The tangible connection relates to the transmission of advanced knowledge and the most recent facts. The intangible connection relates to the development in students of an approach and attitude towards knowledge… The global connection describes the interaction between teaching and research at the departmental and not just individual level. (Neumann, 1992:162)

In Table 7 the ways in which research may enhance teaching in universities are highlighted, both from the perspective of students (Jenkins et al 1998) and senior administrators (Neumann, 1992).

Table 8 - Negative Effects of Research on Teaching

If someone is paid to be here and teach, that is what they should be doing…but presumably university staff are also paid some time to be spent on research. (Student cited in Jenkins et al, 1998)
I feel cross when I sit in a lecture, their research may be great, but they can't teach…(Student cited in Jenkins et al, 1998)
Staff were not available to students. (Jenkins et al, 1998:133)
They seemed preoccupied with their research at the expense of teaching. (Jenkins et al, 1998:133)
In certain cases, staff research could have too great an influence on the curriculum. (Jenkins et al, 1998:133)
Students did not perceive themselves as "stakeholders" in staff research. (Jenkins et al, 1998:133)
Results offer little or no foundation for a belief in the existence of a positive causal relationship between effective undergraduate teaching and high levels of research activity in Australian higher education. (Ramsden and Moses, 1992:291)
The evidence we have collected largely contradicts the belief that research and teaching inform directly upon each other (Shore et al, 1990:34)
Consensus that the emphasis on research in determining careers has gone too far (Court, 1999:65).

Whilst Table 7 highlighted research enhancing teaching, research may also have negative effects as highlighted in Table 8.

Table 9 – Positive or Negative Effects of Teaching on Research

(+) The intangible connection … provides a stimulating and rejuvenating milieu for academics. (Neumann, 1992:162)
(+) The global connection describes the interaction between teaching and research at the departmental and not just individual level. (Neumann, 1992:162)
(-) The evidence we have collected largely contradicts the belief that research and teaching inform directly upon each other. (Shore et al, 1990:34)
(+) Acknowledging the contribution which students make to academics' work through their literature searches, field data, dissertations, and work and life experience. (Hughes and Tight, 1995:63)
(+) Seeking and valuing the contributions of students in developing research methodology and analysis through their involvement in work-in-progress seminars. (Hughes and Tight, 1995:63)

The debate has been presented in terms of the mutually beneficial union between research and teaching. However, in reviewing the empirical evidence the goal appeared to be to find evidence that research either positively or negatively impacted upon teaching. The paucity of findings about the positive or negative effects of teaching on research is highlighted in Table 9. Table 9 does not mean that teaching does not impact upon research, for example the expansion of HE may well have negatively impacted upon research. It appeared that studies into research and teaching relationships were skewed towards how research impacts upon teaching, rather than how teaching impacts upon research.

Conclusions

In the following section conclusions are drawn in terms of an evaluation of the literature, specific learning about research and teaching relationships, policy implications arising out of the paper and further research suggested by this paper.

Interest in relationships between research and teaching was most evident in the early nineties. The ending of the binary divide in Australia (1987) and the UK (1992) may have been the impetus for the spate of papers, which attempted to establish if research and teaching needed to be kept together within institutions. The relatively limited amount of empirical work undertaken with regards relationships between research and teaching was surprising. The majority of papers were based upon the author's observations, reflections and experiences, rather than systematically collected empirical material. When original empirical work had been undertaken it was small scale (such as a single department or departments in an institution).

The major strength of this literature was the fact that academics were beginning to seriously explore potential relationships between research and teaching. The early work in the late eighties and early nineties can be criticised for being inconclusive and methodologically flawed (see Table 1). However, this research could also be criticised for being epistemologically ambiguous. This was particularly problematic given the centrality of "knowledge" to the debate and the fact that the debate crossed over academic discipline boundaries. A notable exception was Brew (1999); her work makes earlier work appear naïve and is an exemplar in terms of explaining the significance of epistemology to the debate (see also Long, 1994). It is likely that this later writing will influence work over the next decade.

Another question that needs to be asked of this literature was did it reflect the varied interests of different stakeholders (academics, students, administrators and governments) in research and teaching relationships? The most common orientation was from the perspective of academics themselves. However, papers from other perspectives offered interesting counterpoints. Surprisingly very little research focussed upon the student experience of being taught by researchers. However, this gap in the literature was beginning to be addressed by the late 1990s (Jenkins et al, 1998; Breen and Lindsay 1999; Lindsay et al, 2002). Also, there are reasons to doubt that the academic perspectives on research and teaching relationships reflected the whole academic community (Court, 1999).

What can we learn from this literature review?

The tendency in the literature was for authors to draw conclusions based upon their reflections on their own experiences (see Table 1). The following section sets out the major themes emerging from the literature and subsequent sections highlight the practical implications of these findings. The major themes discussed in this section are:

- Research and Learning not Research and Teaching
- Relationships not Relationship
- Research Processes as well as Research Content
- Dynamic Relationships not Static Relationships
- Acknowledging Scholarship
- The Role of Administration
- Lecturers Undertaking Research is no Guarantee of the Effectiveness of their Teaching.

Research and Learning not Research and Teaching

The two major activities of "research" and "teaching" invariably are reflected in the titles of papers reviewed. However, there appears to have been a realisation (or acknowledgement) that these two activities are not comparable (Barnett, 1992:623). This led to the debate shifting from research and teaching to research and learning in the mid to late-nineties. Whilst, the emphasis upon learning not teaching is not a big leap in terms of what is happening in higher education in general, conceptually it appears to have been a big leap for the authors of the research and teaching literature.

Relationships not Relationship

There was a "Loch Ness Monster" element to the early literature reviewing with a desire by academics to discover the relationship between research and teaching, even in the face of contradictory evidence (White, 1986). The illusive nature of the relationship may partially be explained in terms of the lack of emphasis upon learning (see previous discussion). The other part of the explanation relates to the contextualisation of findings. There is a need to acknowledge differences, in the context in which research and learning takes place, which will mean that there are many different relationships between research and learning. For example, within a single university there could be a range of relationships between research and learning in different faculties. Identifying that there will be highly contextualised relationships, rather than a single generalised relationship was another significant finding of the literature review.

Research Processes as well as Research Content

There is a need to deliver research informed content. However, the literature review has challenged the notion that research exclusively informs the content of teaching (see for example Brew and Boud, 1995). As well as, content the researcher/lecturer can draw upon their own learning about research processes, which may allow them to empathise with students and also share tacit knowledge about doing research with students. In understanding relationships between research and learning there is a need to consider both research processes and research content.

Dynamic Relationships not Static Relationship

Relationships between research and learning are not static. Researchers as students for life (Beveridge, 1957) learn about research and their students learning through doing research (Brew and Boud, 1995:268). We are learning all the time about how students learn. In particular shifting the emphasis from how we teach to how students learn, with one consequence of this being student centred learning. As well as, ongoing practical learning about research and teaching, paradigm shifts in terms of the state of knowledge in general take place.

Acknowledging Scholarship Scholarship is a precondition of both good teaching and good research (Elton, 1992:253). However, failing to differentiate scholarship from research and teaching when writing about research and teaching relationships may confuse matters (Moses, 1990, Elton 1986 & 1992). For example, in the paper by Jenkins et al (1998) students appear to be referring (at times) to the scholarship of their lecturers, which is then used to confirm a relationship between research and teaching. Distinguishing the role of scholarship may seem a question of semantics. Elton (1992:253) does acknowledge that the three activities of research, teaching and scholarship should not be thought of as clearly separable activities. However, acknowledging scholarship adds sophistication to the debate in terms of more precisely defining the work that is being undertaken and in terms of more focussed policy options.

The Role of Administration
Whilst, universities are active in three fields – teaching, scholarship and research (Elton, 1986:301), in terms of the changing academic context administration needs to be added as a fourth activity. Court (1996) identified a term-time increase in administration since the Robbins survey (11% to 33%).

Potential negative consequences of this increase in administration are in terms of less time spent upon research and/or teaching. However, potential positive consequences, are that a researcher/lecturer may build a research orientation into the design of a course or encourage student research project work and may have an input in choosing staff to teach and supervise.

Lecturers Undertaking Research is no Guarantee of the Effectiveness of their Teaching.
In reviewing the literature the debate at times appeared fractious. For example, the Ramsden and Moses (1992) paper discussed earlier may be viewed, as a strong defence of the effectiveness of lecturers who do not do research (see also, Barnett 1992). In essence they are responding to the implication that researcher/lecturers are more effective teaching staff than those staff exclusively lecturing. As Court (1999:87) warned staff with modest or non-existent research profiles "will find it hard not to feel second-class citizens". There was evidence of unease that researcher/lecturers were favoured over lecturers. Court (1999) found that slightly more than half his respondents believed that promotion at their institution placed too much emphasis on research. As long as the debate is presented adversarialy as research versus teaching it will be perceived in this way. Research may be one way of enhancing student learning, it is certainly not the only way of enhancing student learning and the research of Jenkins et al (1998) highlighted the detrimental effects of research on teaching as perceived by students.

What are the policy implications of this literature review?
A feature of this particular literature was a desire amongst the featured authors to inform policy. This section draws upon those prescriptions, as well as other policy implications, which may be more broadly drawn from the literature review. The following institutional policy implications are very much dependent upon context. Policy may need to be different for a Chemistry Department as compared to a Law Department. The policy implications discussed in this section are as follows.

- No Action Required
- Link the Research of Staff and Students (where appropriate)
- Support Research and Teaching through Scholarship
- Publish a Research and Teaching Policy Statement
- Publicise outcomes of Research and Scholarship
- Target Research Informed Activity
- Review Personnel Policies

No Action Required The conclusive evidence that there is a universal mutually beneficial relationship between research and teaching in universities does not exist (see Table 1). In the previous section it was argued that the debate needed to be reconfigured

Research and Learning not Research and Teaching
Relationships not Relationship
Dynamic Relationships not Static Relationships

This reconfiguration is likely to lead to the identification of highly contextualised case examples of relationships between research and teaching. In the absence of conclusive evidence of a research and teaching relationship it can be argued that no action can be undertaken and policy makers may even wish to challenge anecdotal assertions about the existence of such relationships.

Link the Research of Staff and Students (where appropriate)
In the light of research and teaching being carried out in parallel in universities there are benefits to linking staff research and student research. Hughes and Tight (1995:63) and Jenkins et al (1998:136) both advocate the explicit linking of the research of staff and students (see Tables 5 and 6). In the literature review the papers of Winn (1995) and Goodlad (1998) were cited as case examples of staff research and student research being linked. In a climate of resource constraints collaborations between staff and students appear potentially mutually beneficial, both enriching the student learning experience and allowing academics to achieve more than they could by working in isolation.

Support Research and Teaching through Scholarship
In striving to deliver high quality teaching and high quality research it is easy to lose sight of the scholarship, which should underpin both activities. However, as Elton (1986:302) has eloquently warned scholarship is "…the tenderest plant, since it is never the prime purpose of an institution." Elton (1992:265) argues for time allowances for academics to undertake scholarship, which would potentially benefit both the quality of teaching and research.

Publish a Research and Teaching Policy Statement
Davies and Glaister (1995:281) found that sixty–one per cent of mission statements gave approximately equal weighting to teaching and research. Given the centrality of these two activities in universities it would be worthwhile making explicit how these activities are believed to inform each other (or if they are believed to inform each other) within a particular institutional context. This may reflect an aspiration as much as a reality, but it would provide a focus.

Publicise Outcomes of Research and Scholarship
Hughes and Tight (1995:51) suggest in an ideal situation "students are seen as short-changed if they are not learning from a lecturer at the frontiers of knowledge", although Ramsden and Moses (1992:293) warned undergraduate students about equating a high research status institution with the best teaching. However, Jenkins et al (1998:133) found that staff research gave staff credibility, in student eyes, to their degree and to the department/university in which they are studying.

Target Research Informed Activity
One of the limitations of the literature reviewed was that the empirical studies tended to focus upon research and teaching relationships at undergraduate level, rather than postgraduate level, which may be a by product of the "undergraduate fixation in British Universities" (Clark, 1993:312).
However, Neumann (1992:167) states "Postgraduate teaching/supervision is impossible without an academic actively pursuing his or her own research…"

Review Personnel Policies
Research output being used as a surrogate for teaching ability has resulted in polarised positions being taken around research and teaching relationships. Barnett (1992:623), for example, wrote critically about research as academic currency bestowing credibility.

Whilst, Ramsden and Moses (1992: 291) critically question the view that "…there is no need separately to measure, or reward, teaching effectiveness. Research prowess can stand as valid proxy for teaching quality." It is easy to see how such a view could be very corrosive to the goals of higher education.

Universities need to review their strategic aims and ensure that their personnel policies are aligned to these aims. If the major activity of a university is teaching rather than research, universities need to think about how they support and encourage staff through rewards and promotion based upon teaching. Universities need to avoid rewarding successful researchers at the expense of successful lecturers.

What further research does this literature review suggest?
Whilst ending a research paper with areas for further research is a cliché given the critical nature of the paper it is particularly relevant. Much of the research reviewed was inconclusive and methodologically flawed. A conclusion can be drawn that the debate was wrongly configured. The following areas merit further research.

- Contextualised Case Studies
- Encouraging Reflection upon the Student Experience
- Postgraduate Research and Learning Relationships
- The Role of Scholarship in Research and Teaching
- Learning from Researchers

Contextualised Case Studies The learning from the literature review is that there is a need for contextualised case studies. These case studies need to depict relationships between research and learning in a manner similar to the layers of an onion. The reader of the case needs the following information as a minimum:
Institution: Type, size and strategic objectives etc.
Students: Level, ability, age etc.
Academic: Experience, orientation etc.
Course: Learning outcomes, history, external examiner etc.
National: Political climate, economic climate etc.

This information does not need to be detailed, but it does need to be provided. This would allow the reader to understand relationships between research and learning within a specific context. These case examples could be gathered within a university and circulated within the university in order to encourage debate and reflection about the different relationships between research and learning.

Encouraging Reflection upon the Student Experience

Reflection upon research and learning relationships encourages active as opposed to passive engagement in the student learning experience. The findings of Jenkins et al (1998) about student's perceptions of staff research are both encouraging and troubling. Students perceived advantages and disadvantages to staff research. The comment from a student in a focus group "I feel cross when I sit in a lecture, their research may be great, but they can't teach…" brings the grand debate about research and learning back to an important and very practical level.

Postgraduate Research and Learning Relationships

Postgraduate learning merits special attention, due to the rate "at which knowledge changes, as well as the critical, questioning stance required" (Neumann, 1992:167). Despite this researchers have tended to research teaching and research relationships at undergraduate level (Shore et al, 1990; Ramsden and Moses, 1992; Jenkins et al, 1998 and Breen and Lindsay, 1999). There is a need to research relationships between research and learning relationships specifically at the postgraduate level. At this level there is the potential for closer relationships due to students engaging in their subject more deeply and being likely to undertake independent study.

The Role of Scholarship in Research and Learning

A potential negative consequence of academics undertaking increased administration in HE is that it may reduce the time spent upon scholarship, which underpins both good teaching and research. If we take this speculation a little further it is feasible that academics have accommodated the expansion of HE through doing more teaching and research but less scholarship. If this were the case in the short term it would not be that tangible, but in the longer term it would have a negative impact upon both quality of research and teaching. In terms of scholarship we need to know more about how scholarship informs teaching and how scholarship informs research.

Learning from Researchers

Brew and Boud (1995:271) posed the question how can studies of researchers as experienced learners help us understand the promotion of deep approaches to learning? Rather than researching relationships between research and teaching why not study research in order to gain new insights into learning. Reconfiguring the debate in terms of learning and research encourages an appreciation of the similarities between the two activities.

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