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Strengthening the **Nexus Between** **Teaching and Research**

01/2

Ann Zubrick
Ian Reid
Paul Rossiter

Office of Teaching and Learning,
Office of Research and Development
Curtin University of Technology
In association with the University of Ballarat
and the University of Western Australia

Evaluations and Investigations Programme
Higher Education Division



Department of Education,
Training and Youth Affairs





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Abbreviations and acronyms

ATN	Australian Technology Network
CAE	College of Advanced Education
CAL	Computer Assisted Learning
CEA	Centre for Educational Advancement
DETYA	Department of Education, Employment and Youth Affairs
DVC	Deputy Vice-Chancellor
EIP	Evaluations and Investigations Programme
EFTSU	Equivalent Fulltime Student Unit
IT	Information Technology
OTL	Office of Teaching and Learning
PBL	Problem-based Learning
R&D	Research and Development
SEDS	Scholarship and Educational Development Services
SMEC	Science and Mathematics Education Centre
TLC	Teaching and Learning Committee
TLF	Teaching and Learning Forum
UB	University of Ballarat
UWA	The University of Western Australia
VC	Vice-Chancellor

Executive summary

This investigation has moved the debate on the teaching/research nexus from the restrictive question: 'Is there a nexus?' to a systematic examination of the nexus as it actually operates in three very different universities—The University of Ballarat, The University of Western Australia and Curtin University of Technology. The assumption was that, since teaching and research are widely regarded as the two core activities of academics, it would be worthwhile to determine whether, and if so how, the relationship between them was being enhanced in policy and practice under different institutional circumstances. A primary focus of the project was the undergraduate experience, since undergraduate teaching is the core activity of most Schools and Departments, and links between research and postgraduate learning are generally easier to determine.

Strengthening the nexus is commonly thought to be urgent within an academic environment that is changing rapidly under the combined pressures of policy, technology and community demand. Increasing numbers of individuals are seeking a university education at both undergraduate and postgraduate level to meet increasingly sophisticated workforce requirements, changing technologies and social relationships. Progress in meeting students' educational needs with available resources may well require an institutional commitment to ensuring greater linkages between teaching and research activity. Reputations for teaching and research are also becoming intertwined as universities position themselves competitively and define their particular and distinctive approaches to learning.

The project included a systematic review of current policies in each of the universities, supplemented by semi-structured interviews with key members of each executive team and staff teaching in humanities and social sciences, sciences and the professions. Through these interviews we sought to identify examples across disciplines and institutions of good practice linking teaching and research; some of the problems staff and Schools/Departments face in linking the two activities; and the key reasons for doing so.

Our overall findings were as follows:

- Within and across the three universities several kinds of connection between teaching and research were operating productively in both directions;
- Among the senior executive staff in each university there was systematic reflection regarding ways to create (through policy and strategic initiatives)

interdependence between research and teaching for the benefit of students, staff and the institution;

- Examples of a nexus were evident in many areas of undergraduate learning, especially in professional courses;
- Many staff reported engaging for much of their time in activities that simultaneously accomplish teaching and research goals;
- Staff in each university, working across a range of disciplines, fulfilled at least some of their scholarly objectives through pedagogic research;
- The relationships between teaching and research were differentiated by discipline, level of teaching and institutional mission;
- Many factors helped to strengthen the nexus including curriculum demands, professional accreditation requirements, publishers' requirements and changing academic work practices, as well as institutional policies and strategic initiatives; and
- Institutions, their staff and students can all benefit when scholarly teaching and research are recognised and rewarded within a unifying framework that enables these two aspects of a community of learning to work as warp and weft.

Across the three institutions there were some similar and some clearly different impediments to a nexus. Differences were related to such factors as:

- the numbers of research-only and teaching-only (part-time) staff;
- types of teaching undertaken—especially service teaching;
- types of research undertaken;
- the rate of knowledge change within the discipline;
- the composition of the student body including the cohort size and the proportion of international students (especially students with a first language other than English);
- the number and diversity of postgraduate research students; and
- involvement in offshore and distance education.

Each university was actively involved in redevelopment of a range of policies with a view to integrating its core activities and providing appropriate rewards and incentives to reflect increasingly diverse forms of scholarship. The form of this review reflected differences in institutional mission and directions. Some concern was expressed that the revised DETYA funding mechanisms could result in a separation of teaching and research and that it was desirable to shift to financially supporting links between the two areas.

A common theme that emerged was that institutions can assist academic staff as they work towards better integration of their activities through leadership development that enables Heads to:

- provide professional mentoring for their staff;
- identify sources of support to enhance staff performance in teaching and research;
- reduce demands that conflict with core activities;

and through

- revising promotional criteria to include a broader range of scholarly activities; and
- publicising how this broader array benefits both undergraduate and postgraduate students.

Changing academic work practices and external pressures make the aligning of policy and practices with reward structures an ongoing challenge for institutions and staff.

1. Introduction

While the general status of teaching in Australian universities has improved in recent years, concern is being widely expressed about a perceived disjunction between teaching and research. One example may stand for many: late in 1999 the Australian Vice-Chancellors Committee lent its public support to a policy document *Australian Science: an investment for the 21st century* issued by the Federation of Australian Scientific and Technological Societies which includes a call to ‘fund universities so they can advance knowledge through research, enthuse students through teaching, and ensure that discovered knowledge is transmitted from generation to generation’ (FASTS 1999, p. 16). The document outlines four critical policies—the fourth one being: The nexus between research and teaching must be preserved. The report notes that ‘University staff need time for scholarship, research and teaching. If our young people are to be enthusiastic about scientific knowledge and its application they must be taught by people who are actively involved in the practice of science’ (p. 15). Such a claim might equally be made for other fields of study.

If they are to have much cogency, statements that insist on the value of a nexus and the necessity for preserving it ought to be grounded in an engagement with the changing roles of universities and those employed by them. In their recent study *Academic work in the twenty-first century*, Coaldrake and Stedman (1999) remark that ‘in practice the teaching and research expectations of academic staff are often narrowly defined and considered as separate entities’ (p. 17). This does not inhibit the authors themselves from defining research in simple terms as ‘the generation of new knowledge’ and teaching as ‘the transmission of knowledge’—formulations that some would regard as unduly narrow and separate. In any case, as the pace of change in higher education accelerates, the nature and interconnection of ‘teaching’ and ‘research’ have become more problematic (Elton 1992; Rowland 1996). One contributing factor is tighter government control over university funding, through mechanisms that tend more and more to treat the two activities as discrete. Another is the growing popularity of the overriding notion that universities, and education in general, are obliged to prepare students for the ‘world of work’. At the same time universities themselves are operating in a marketplace in which a price (but not always a value) can be placed on teaching and research. Inevitably this combination of influences is having a profound consequence for what academics have traditionally regarded as their two core activities.

Questions about an interrelationship of those activities have often been posed in unproductive terms. The present study is more pragmatic, attempting to

move the debate away from a sterile preoccupation with binary categories and reductive measurements towards a systematic examination of the extent to which the nexus actually works in various institutional settings. How do academic staff and senior managers perceive particular linkages between these dual dimensions of scholarly practice? What policy frameworks have been devised to enhance the complementarity of teaching and research? What impediments are being encountered? How are such questions inflected in different disciplines and different universities?

Although the now considerable numbers of published investigations of the links between teaching and research have largely failed to establish an empirical connection between the two, the topic continues to attract attention. Much published work on the problematic relationship between research and teaching is summarised by Hattie and Marsh (1996), whose meta-analysis of 58 studies claims to demonstrate that the relationship is zero. This study and others like it are open to criticism for an overemphasis on correlational studies; for confusing productivity with quality; and for largely neglecting other perspectives on the nexus—especially those relating to the experiences of academics and students. Many academics and many institutional mission statements emphasise interdependence between quality teaching and learning and staff research and other scholarly activity. For example, the Macquarie University Research Management Plan (section 1.1 page 1) identifies the role of research in the wider scholarly mission of the University thus:

Vested in universities is a unique and ongoing responsibility to provide the highest levels of scholarly education. Research activity, through the knowledge it creates and the education it provides to both students and staff alike, must ultimately service that end.

Recent Government policy papers, on the other hand, have offered more critical (some would say more realistic) views of what actually does or should take place within institutions of higher education. They have focused, for example, on increasing access and participation in undergraduate education, developing the quality of that provision, and building closer links with employers. Teaching and research have therefore been discussed as if they were quite distinct activities, with the intention to make the funding of each more competitive and selective. And, given their continuing dependence on state funds, some universities and academics have responded by modifying their claims for an irreducible linkage.

The current challenges within higher education demand that universities manage research and teaching more effectively. Despite their ‘zero’ finding even Hattie and Marsh (1996) suggest that the aim should be ‘to increase the circumstances in which teaching and research have occasion to meet, and to provide rewards not only for better teaching or for better research but for

demonstrations of the integration between teaching and research’ (p. 533). At the heart of debates about the nexus between research and teaching within universities are two key questions:

1. Is a connection between research and teaching necessary, or at least valuable, in a university setting?
2. If so, what should the nature of this link be and how should it operate?

Accordingly, the present project focused in part on key policy and management issues—on how to create favourable conditions for enhancing the interaction and integration of high-quality teaching and research activities. Since many academics do *not* regard relationships between teaching and research as necessarily conflictive, this project also focused on uncovering some bases for these views. How do academic staff within different disciplines and working in three very different Australian universities understand the nexus and believe it can be strengthened? Does it necessarily become stronger when research is brought explicitly into teaching as proposed in the influential 1998 Carnegie Foundation paper *Reinventing undergraduate education*? Is it guaranteed when teaching is made the subject of research? Does it result when academics focus on integrating their two core activities in attempts to manage their work demands more productively? How is the nexus understood within different university contexts and across the disciplines? What effect do different policy initiatives have?

Three major processes were used to explore these questions:

- interviews with key members of the executive team at each university;
- analyses of the relevant policy documents (notably those relating to Teaching and Learning, Research, Promotions and Staff appointments) and associated key discussion papers; and
- interviews with academic staff whose units demonstrated different types of linkages between teaching and research in the three institutional settings.

Hard questions arise with regard to appropriate policies and management processes. One of these questions may seem invidious but ought to be faced squarely: whether all Australian universities, whatever their particular mission, history, physical size, location, and scholarly orientation, can reasonably be expected to foster the same sort of relationship between teaching and research. Hence the inclusion of distinct types of institutions in this project for comparative purposes.

Three universities, quite different from one another in their respective mission statements and their institutional profiles, were juxtaposed for investigation in terms of the scope each has for strengthening the teaching/research nexus. The University of Western Australia (UWA) is a well-established prestigious ‘sandstone’ with proud claims to teaching and research excellence within a

relatively traditional framework of academic values. Curtin University of Technology is (like UWA) predominantly metropolitan, but newer, larger, and more diversified, with a mission that emphasises (as with other members of the Australian Technology Network) the application of knowledge to practical problem-solving. The University of Ballarat is also a newcomer, but non-metropolitan, small, and lacking a critical mass of active researchers usually associated with an institution of advanced learning.

The central focus of the study was on how universities can most effectively manage their activities in order to create optimal synergetic links between university teaching and research. A subsidiary aim was to test the view that teaching and research are underpinned by common scholarly values of learning. Explicating both the values and the links was assumed to be useful to students, academic staff, universities, disciplines, and the community.

The paper starts with a brief review of interpretations of the nexus in the previous literature. After an outline of the methodology, there follow descriptions of the nexus within the selected universities. Further sections contain comparisons of how the nexus operates and impediments to a nexus in each of the universities. Finally, the paper offers suggestions for achieving a stronger nexus.

2. The teaching/research nexus: a review of the literature

Several recent articles have made a case for bringing teaching and research closer together. Ernest Boyer's 1990 seminal paper began an extensive debate about concepts of scholarship that integrate teaching and research. Others, intent upon raising the status of teaching, identify how teaching might become more like research (e.g. Barnett 1997), while Gibbs (1995) describes how teaching and research might be evaluated in comparable, robust ways. Among those who work in universities there seems to be a general desire to integrate the two core activities. Coaldrake and Stedman (1999, p. 17) note that most academics are expected to be involved in both research and teaching, and that 'the interplay between the two is widely held by academics to be a necessary part of ensuring quality.'

This section highlights conceptual ways of relating teaching and research, summarises some of the now well-documented difficulties with existing literature on the topic and considers reasons for bringing teaching and research into closer alignment.

2.1 Conceptions of the nexus

The scope and value attached to any teaching/research linkages will depend fundamentally on how each activity itself is conceptualised. If for example one takes the simple dichotomous view recently expressed in Coaldrake and Stedman (1999, p. 17) that research is 'the generation of new knowledge' and teaching is the 'transmission of knowledge', then many academics who want to integrate them can be seen as wishfully pursuing a 'romantic preference' (p. 19). Yet such clear binary definitions are seldom adequate to the real complexity of either teaching or research in practice. 'Transmission' implies teacher-dominated instruction and ignores the substantial move towards more self-directed and distributed forms of learning. And this move has come about partly because educational research shows that people learn best when they have some control over certain elements in the process of acquiring knowledge.

It is on *practice* that the present enquiry focuses—on what is actually happening across a range of circumstances. That grounding in the practical details of current academic work, operating within specific institutional policy frameworks, should prevent an avowed interest in 'strengthening the nexus'

from lapsing into a mere assertion of an a priori belief that teaching and research are inherently symbiotic.

Current practices, however, need to be considered in relation to theoretical writings that contribute to them and in turn reflect on them. A growing body of published work attempts to clarify the nexus in ways that take account of both change and continuity in the nature of academic work.

For Brew and Boud (1995) teaching and research are related insofar as they are both forms of learning.

The relationship between teaching and research can never be satisfactorily demonstrated. Learning however is the vital link between research and teaching. It is a shared process in these two enterprises. Learning acts as a powerful intervening factor in all of the studies attempting to demonstrate a relationship between teaching and research since it is the process whereby an individual—teacher, researcher, student, learner—comes to know. This is not to say that research is wholly about learning, any more than facilitating learning is the whole of teaching. But it is the significant and substantial element that they share. Teaching and research are correlated when they are co-related, i.e. when what is being related are two aspects of the same activity: learning.

Brew and Boud 1995b, p. 268

Others (University of Ballarat Submission to the Review of Higher Education, Financing and Policy 1997; Candy 1998) relate the two core activities through the concept of scholarship, notably through the four scholarships Ernest Boyer (1990) first suggested in his widely acclaimed monograph *Scholarship reconsidered: Priorities of the professoriate*. At the heart of this conception is the ideal that scholarship is a disciplined expression of the scholar's love of learning which ought to be nurtured in the context of a commitment to vital and free enquiry. Scholarship, in this view, encompasses a variety of activities:

- discovery of new ideas;
- careful investigations of problems;
- enlightening exposition of problems;
- informed explanation of theories;
- unifying syntheses of divergent accounts;
- application of theories to practical problems; and
- scholarly teaching

These activities become part of scholarship as they fit into a larger scholarly enterprise that is defined by four features:

1. Scholarship emerges from enquiry and builds explicitly on existing knowledge;
2. It is creative and progressive;
3. It is generative and productive; and
4. Its outcomes are public.

This definition breaks the mould that has forced the identification of scholarship with 'cutting edge' research that culminates in juried publications. Within the definition good teaching qualifies as scholarship when:

- teachers' lessons properly emerge from enquiry and build upon existing knowledge;
- teachers' engagement with their subjects and their students is creative and progressive;
- their efforts are productive of learning and strategies for learning;
- results of their efforts are open to public evaluation; and
- they convey academic and disciplinary values and ways of thinking.

The term scholarship has other meanings than those ascribed by Boyer. For Elton (1992) and Neumann (1993b) scholarship is a way of thinking and working, and not an attainment. Scholarship is central to the academic work process. It is crucial to producing quality research since it is part of systematic enquiry and it 'describes a quality, or mode of working...scholarship is more than an activity. It can be considered as a manner of enquiring and a quality within academic work' (Neumann 1993b, pp. 103–4). Thus understood, scholarship is a third legitimate academic activity to sit alongside, while remaining distinct from, teaching and research. The nexus is therefore an indirect relationship mediated through scholarship, and varying according to the different disciplines.

Moses (1990) has also highlighted disciplinary differences in the nexus:

Teaching is experienced differently in the different disciplines; in some it may be largely divorced from research. In English and Law, there is a necessity to align teaching and research interests. Here scholarship provides a bridge between both, and, particularly in English, the boundary between research and scholarship is fluid. It is important that these differences are noted in workload allocation, staff-student ratios, and in funds for research (p. 373).

Overarching these disciplinary differences are more general types of connection. Neumann, in her interviews with academics and administrators,

found multiple, positive and bi-directional links between teaching and research areas of academic work. She distinguished three broad types of connection, which were not necessarily separate or clearly delineated. Rather they intermingled. The first she terms the *tangible* nexus which she describes as the connection that 'relates to the transmission of advanced knowledge and the most recent facts'. A second, *intangible* nexus is evident when both students and academics are enlivened through their engagement in teaching and learning. The *global* nexus 'describes the interaction between teaching and research at the departmental and not just the individual level' (p. 162).

These multiple and bi-directional levels of the nexus have been confirmed in more recent work undertaken by Smeby (1998). Smeby's study, based on survey data and interviews, showed that university staff believe that research and teaching positively influence each other, although the subjects believed that research is more important for teaching than vice versa. Smeby noted that the characteristics of the interaction vary according to levels of teaching and among the disciplines. In general, the interaction was stronger at graduate than at undergraduate levels. Although teaching and research can negatively affect each other, Smeby's subjects recommended combining the two tasks and conceptualising different, albeit indirect relationships for the different disciplines. For Smeby, recognising different forms of the nexus does not imply a weak nexus: 'Saying that the interaction between teaching and research is indirect and complex need not mean that the interaction is weak. On the contrary, there are indications that the interfaces are important and manifold' (p. 18).

Importantly, the relationship between teaching and research is taking place within a changing context of higher education. Reflecting upon this changing context, Brew's (1999) basic observation is that discussions of the nexus need to be placed within a framework of different epistemological concepts. If knowledge is reified in empiricist terms and seen as separate from knowers, it will by the same token be separated from teaching, with the latter regarded as a vehicle for conveying information and ideas. But if the emphasis falls (as increasingly and properly it does in academic discourse today) on the intimate and interpretative aspects of knowing, it becomes clear that 'research' involves processes and outcomes which are not reducible to mere outputs (as they tend to be in the problematic studies cited and discussed below). A focus on the experience of research, on the discovery process in its full sense, with its self-reflexive insights, meaning-making and skill development, brings out the fundamental identity of research with the learning that students experience, and thus with the scholarship of teaching. Brew cites Westergaard (1991): '...research and academic teaching are indivisible because—but also

just so long as—they share with the scholarship which should feed into both alike that spirit of active enquiry which is higher education's *raison d'être*' (p. 298).

2.2 Problems with existing measures of research and teaching

Recent research reviews (Neumann 1996; Brew and Boud 1995b) of the teaching/research nexus have identified key problems in defining and measuring both research and teaching, in interpreting the close to 'zero' or insignificant correlations found in meta-analytic studies and in developing research questions and designs suitable for complex issues.

Empirical studies into the teaching/research nexus are predominantly correlational. The findings rest upon underlying conceptions of teaching and research as being reducible, for example, to student ratings of teachers' instructional effectiveness and measures of research productivity (such as publication counts) respectively. Both teaching and research are highly complex activities and both are notoriously difficult to measure; yet the measures reveal an instrumental conception of both activities. The implied relationship between teaching and research will be a function of the measures used in the correlations—what data were available and how they were gathered. These different methods of data collection and the underlying assumptions become particularly problematic when the data are aggregated and studies synthesised to produce supposedly superior and more powerful findings.

More recently, investigations of the teaching-research nexus have used different approaches. Colbeck's recent work (1998), using in-depth investigations of a small number of academics, found that teaching and research activities can overlap but in very specific ways. For example, research is much more likely to overlap with independent project work or dissertation supervision than it is with classroom teaching. In contrast, Hattie and Marsh (1996) and Feldman (1987), who undertook meta-analyses of teaching and research outcomes, did not find a nexus because they focused on only a few aspects of each activity—for example on classroom teaching. Feldman's review of more than 200 research studies found little relationship between student ratings of teaching excellence and various forms of research productivity.

As Brew and Boud (1995b) have noted, there is little active debate about what is 'research' and what is 'teaching'. The nature of the two is generally taken as given. In order to carry out statistical analyses, good teaching and

research are defined by the measures used to assess them—such as numbers of publications (Linsky and Strauss 1975), citation scores, judgements of departmental heads or peers and research grants (Bresler 1968) in the case of research; and student and staff ratings of teaching effectiveness (Centra 1983).

Research productivity is frequently confused with both quality and impact. Some would argue that measures of research productivity reflected through citation counts come closest to measuring research quality. Using citation counts, Feldman (1987) still found no relationship with teaching quality. However, the use and interpretation of citation counts varies according to discipline and poses difficulties in comparing data across disciplines. Which is the more meaningful indicator of research quality and impact, the single monograph or paper widely cited, or a number of shorter articles distributed across journals? Should citation arising out of controversy, especially that which relates to questionable science or scholarship, be treated equally to that which does not? Productivity, impact and quality are often used interchangeably as descriptors in the literature, yet there are important methodological and psychometric differences. Quality is almost never assessed directly; productivity and impact, through citation, frequently pose in its place.

If the view of research productivity is largely mechanistic, so too is that of teaching. Rarely is there any discussion of the type of teaching being undertaken—such as didactic lecture, exploratory seminar, laboratory session or tutorial. However, effectiveness as reflected through measures of a teacher's subject knowledge, clarity of presentation, well-structured course outlines and so on suggest that teaching performance is often reduced to lecturing and assumes a direct instruction model. It also deals with basic, generic teaching principles rather than focusing on discipline-specific teaching. Yet good teaching implies detailed subject knowledge which can be communicated and transformed in different situations and ways of responding to these situations (Neumann 1994). Complementary to this are the developments in learning theory. Contemporary views of effective tertiary teaching for learning have moved well beyond direct transmission models. (For a review and many examples see Biggs 1999). The concept of effective student learning, or deep learning (Marton 1981), encompasses a range of ways in which students engage in enquiry. It situates knowledge in relation both to what students know and how the knowledge is to be applied. It encourages responsibility and autonomy.

2.3 Teaching effectiveness and research productivity

In their study of associations between research and undergraduate teaching among Australian academics Ramsden and Moses (1992) found negative or near zero correlations both at an individual and an institutional level. In interpreting these findings, they outline three alternative views of the links. The first, the strong integrationist view, suggests that in order to be a good university teacher one must be an active researcher. The second, also an integrationist view, posits links between teaching and research at the departmental or institutional level, but not necessarily at the level of the individual academic. The third is the independence view that claims no causal relation.

Neumann (1992) emphasises that the belief that there is a link is stronger than current evidence for the link. Her investigations of the views of senior academics (Neumann 1992) as well as undergraduate and postgraduate students' learning experiences (Neumann 1994) demonstrate the often subtle and complex relationships within the nexus. She questions whether it is possible to demonstrate the nexus through the sort of empirical research that thus far has dominated the investigations. Notable in her interviews with students was her observation that the academics identified by students as good teachers were, with one exception, all active researchers. However, not all active researchers were identified as good teachers, suggesting that active research involvement is a necessary but not sufficient condition for good teaching.

Critics of American undergraduate higher education such as Clark (1997) and Boyer (1987, 1990) hold that research and teaching conflict and that undergraduate education suffers as a result. Boyer asserts that research activity competes with teaching obligations for time and content (the scarcity model). To accommodate research activity, teaching loads are reduced, teaching assistants are assigned to teaching large classes, and students needs are ignored because staff pursue their own scholarly interests. On the other hand, Grunig (1997) found that in North America 'the amount of research performed by an institution contributes substantially to the reputation of the institution's undergraduate educational program' (p. 42). Evidently the issues are complex.

Studies conducted with British (Jenkins et al. 1998) and Australian (Neumann 1994) undergraduate students suggest that students from a range of disciplines perceive clear benefits from staff research including staff enthusiasm and the credibility of staff and the institution. Like their American counterparts, students experience some disadvantages from staff involvement in research—particularly staff availability.

2.4 Issues and implications

As one systematically considers the literature on relationships between teaching and research it becomes clear that in order to understand the nexus several steps have to be taken:

1. recognise the importance of defining key terms such as 'quality', 'teaching', 'research', 'scholarship', and 'student learning'. Little headway can be made without understanding what these terms mean in the contexts in which they are used. How are quality and excellence in teaching and research determined?
2. decide whether the categories of teaching and research are independent or interdependent. How possible is it to analyse them separately? To what extent are staff asked to treat them in practice as independent or interdependent activities?
3. identify the extent to which institutions shape the relationships. Do the role and purposes of the institution influence the ways in which the nexus is realised? If so, how are these reflected in the ways teaching and research are funded, reviewed and rewarded? How strong are the views that academic staff can, and ought to be, productive in all aspects of their work? To what extent do promotion dossiers demand that academics demonstrate productivity in teaching and research and how both interconnect in their work?
4. determine at what level(s) to examine the relationship. Is it at the level of the Institution, Faculty, School, Department, or individual academic? What does an examination at each level reveal and inform? Are there evident distinctions between undergraduate (junior and senior) and postgraduate levels of teaching?
5. determine the underlying conceptions or models of the relationship. What is the possible range of relationships besides that of claiming that teaching is helped when it is informed by research? How does research benefit from teaching? What are possible disciplinary differences in the relationship?

2.5 Why strengthen the nexus?

In the literature on this topic, a rationale for achieving a stronger nexus between teaching and research reflects diverse concerns and interests.

- **To reassess and redefine the roles of teachers and students in the development of a culture of critical enquiry in higher education.**

An unknown future faces the academic profession at the beginning of the twenty-first century. In the face of shaky financial underpinnings, shifting curricular priorities, unpredictable social needs, crises of public confidence and the revolution in electronic resources, academics and administrators are rethinking patterns of work and institutional organisation to maintain the scholarly environments that have traditionally defined universities. Barnett (1997) argues that in this uncertain future context, both research and teaching need to change.

Rather than hypothesizing a conceptual distinction between teaching and research (which then have to be brought together in some way), teaching may be seen as an insertion into the processes of research and not into its outcomes. What is required is not that students become masters of bodies of thought, but that they are enabled to begin to experience the space and challenge of open, critical enquiry.

Barnett 1997, p. 110

Academics are only now coming to terms with the opportunities and problems presented by electronic information resources. They foresee the potential of new technologies to undermine their own monopoly on advanced education. At present the road to professional careers—whether in sciences, health, education, or engineering—runs through universities which offer both generalised education and specialist training. It is possible that both roles could be lost, at least in part, to external competition. A decade ago the CEO of IBM foresaw:

the possibility that principal institutions for learning and research could well become the corporate college. Why the advent of the corporate college? If, as some forecasters have it, nations face shortages of scientists and engineers, the business community, in order to survive, will fund and staff its own institutions of higher education. Business doesn't have all the answers, but it does understand the requirements of the jobs of the future.

Akers 1989, pp. 14–15

Reid (1996) addresses similar issues in *Higher education or education for hire?* He raises the question of 'whether anything now remains the special province of universities' (p. 130) and suggests that 'although it is meaningful and often important to distinguish education from training, it does not follow that there need be an adversarial relationship between liberal education and vocational education' (p. 132). In this context, one good reason for needing to keep teaching closely engaged with research is that the interrelationship can prevent the knowledge content from becoming rigidified, which is an ever-present danger if 'competency standards' are specified as the basis of a curriculum.

- **To retain status within an increasingly competitive and globalised higher education sector.**

A number of government-led initiatives throughout the 1980s and 1990s resulted in Australian universities becoming less insular and introverted in their activities and more accountable for the ways in which their academic activities met public expectations. Internal and external quality exercises have revealed that universities are increasingly responsive to students and the wider community. 'As far as core activities are concerned, conscientious attention to teaching is more widespread, and efforts to meet community needs and international standards in research have become generally better informed and more professional' (Reid 1996, p. 10).

Reid proposes a set of functional criteria for discriminating among the various teaching and research activities with a view to determining which pursuits belong within a contemporary Australian university. To be included in an institution of higher learning, a field of enquiry must meet four requirements. The first three—functions which government agencies can legitimately monitor—have a firm historical base and relate to the 'public good'. They are:

- a capacity to advance knowledge (through disinterested investigation);
- a capacity to be socially useful (through application to material needs); and
- a capacity to enhance cultural awareness (through creative or critical arts).

But the fourth, and more fundamental requisite—one that concerns 'the intrinsic intellectual quality of the particular field in question'—legitimately falls outside the interests of both government agencies and stakeholders (p. 19). Reid argues that, to be worthy of inclusion in an institution of higher learning, an academic discipline must demonstrate a capacity to be self-reflexive regarding its nature and its language. In other words it requires a foundation in scholarship. It must be able to describe, specify and evaluate its philosophical bases, its historical emergence and discursive practices. Without the application of such criteria it would be possible to admit new disciplines merely on the basis of market values (either student demand for a course or the availability of research grant moneys) to the detriment of shared academic values.

- **To value and reward appropriately the diversity of academic work.**

The introduction of performance-based funding measures for research has had considerable impact upon research output. The measures have also highlighted anomalies brought about by the increasing scholarly diversity in universities. One motivation for extending concepts of scholarship (as Boyer suggests) is linked to identifying how to appropriately recognise, value and reward the diversity of academic work. From this perspective definitions of scholarship that embrace and integrate teaching and research better reflect endeavours within the modern university.

The reality is that, on far too many campuses, teaching is not well rewarded, and faculty who spend too much time counselling and advising students may diminish their prospects for tenure and promotion ... these professional obligations do not get the recognition they deserve ... the faculty reward system does not match the full range of academic functions ... It is unacceptable, we believe, to go on using research and publication as the primary criterion for tenure and promotion when other academic obligations are required.

Boyer 1990, pp. xii 1, 34

While institutional mission statements increasingly refer to relationships between teaching and research, issues at the very heart of current practice must be addressed before staff efforts can gain appropriate reward. As was noted above, they include how quality assessments are to be made, and how teaching should be rewarded for promotion or academic advancement. One of the most talked-about issues in higher education has been the system of rewards and incentives in universities. Studies in both the Australian and North American contexts which look at the reward system consistently find that while the majority of academics spend most of their time teaching, they perceive teaching to be insufficiently rewarded and certainly rewarded less than research. As a consequence the balance between teaching and research has been rethought and revised. But this has been largely because of a focus on teaching and learning. Is it not time also to change the process of thinking about research? There is a further problem that balance may not be enough, since it still suggests two opposite ends of a see-saw. Rather than accept the implicit dichotomy that 'balance' implies, the larger challenge is to integrate teaching with research and to do so across institutions, not just within them.

The way forward for universities is not to be divided into teaching institutions and research institutions, but to make sure that scholarship flourishes in them all and supports both teaching and research... What is need is a quite radical change in the value system of universities, giving equal value to excellence in teaching, scholarship and research, and a much greater differentiation of function between different academics.

Ellon 1986, p. 30

- **To improve the quality of both university teaching and research.**

The strongly integrationist view as described by Ramsden and Moses (1992) asserts a two-way relationship between teaching and research. The best teaching occurs when active researchers use their expertise to inform teaching, while research ideas and approaches are stimulated and sharpened through interactions with students. This view is clearly reflected in the recommendations of the 1998 Boyer Commission Report, *Reinventing Undergraduate education: a Blueprint for America's Research Universities*.

Coaldrake and Stedman (1999) note that there is little empirical support for this view. Nevertheless it continues to be espoused. The claim is made that a university with research-active staff has the ability to apply that research to all levels of teaching, but especially undergraduate teaching, thereby enhancing the students' experiences. It achieves this by showing students both what is possible in higher level learning and also by introducing them to the process of knowledge creation and not just knowledge consumption.

Universities need to take advantage of the immense resources of their graduate and research programs to strengthen the quality of undergraduate education. There needs to be a symbiotic relationship between all participants in university learning that will provide a new kind of undergraduate experience available only at research institutions. Moreover, productive research faculties might find new stimulation and creativity in contact with young, bright, imaginative, and eager baccalaureate students, and graduate students would benefit from integrating their research and teaching experiences.

Kenny 1998, p. 4

- **To raise the status of teaching vis-à-vis research.**

Teaching and learning in Australian universities now has greater recognition than has been the case. The publication of the outcomes of quality audits and Course Experience Questionnaire (CEQ) data has made teaching more visible and subject to both student and peer review. The work of the Committee for the Advancement of University Teaching (CAUT)—now the Committee for University Teaching and Staff Development (CUTSD), together with the National Teaching Awards scheme have raised the status and profile of university teaching. Reducing the disparity of status between teaching and research, and gaining greater recognition for teaching within the higher education sector through appropriately linked reward and funding schemes, is one way to achieve a nexus and has been argued by Ramsden and colleagues (1996).

A recent discussion of the distinctive nature of university teaching programs, contrasted with mere training, reaffirms that 'the best practice in universities will always concentrate on advanced skills in discovering, evaluating and communicating knowledge—and therefore will be integrally linked with research' (Reid 1996, p. 46).

- To strengthen collegial ties within institutions and to reduce the tension between disciplinary and institutional loyalties.

This objective may appear expedient rather than principled. Nonetheless as electronic resources permit regular conversations with national and international peers, the distances that separate scholars from their fellow

disciplinary specialists around the world are vastly decreased. This process has the potential to loosen their ties to local colleagues and create disciplinary professionals with only weak institutional affiliations. Such an imbalance may need a corrective. Being involved in teaching, curriculum discussions and delivery to students has an integrating effect within departments and institutions. The integrity of the academic profession and the ability of individuals to fulfil their professional mission within an institution depend upon a level of collegial solidarity that provides a basis for staff to engage with governance and decision making.

Strengthening collegial and institutional ties also potentially guards against insulation and too narrow specialisation. Teaching keeps academics in touch with the broader context of their research specialisations as well as a new generation of critical scholars and students.

2.6 Summary

The review of the literature on the nexus shows that the discussion has to be both qualified and contextualised. We have noted some definitional problems—for example that one person's 'scholarship' is another's 'research'. We have commented on the complexities of the nexus, and the interrelatedness of teaching and research. In the changing higher education context, we have identified the important impact of shifting epistemology. The 'no nexus' finding may well be related to empiricist assumptions that still shape research approaches and restrict insights into the nexus. Qualitative approaches that investigate how the nexus operates within different disciplines and different institutional contexts hold the potential to inform some key questions. Among them are:

- To what extent are teaching and research being experienced as complementary or contradictory for individuals and departments within different universities?
- What are the implications of institutional policies for the practice of individual academics and their departments?

With particular reference to a range of departments and institutional circumstances we therefore sought:

1. to focus, in part, on key policy and management issues: how to create favourable conditions for enhancing the interaction and integration of high-quality teaching and research activities; and
2. to relate these to the views and practices of academics: how they understand the nexus, see its relevance, and think it can be strengthened.

3. Methodology

Comparisons of ways the nexus operates across the three universities were based upon three complementary methods:

1. interviews with members of the senior executive management group in each university;
2. analyses of relevant key policy documents and other discussion papers; and
3. case vignettes from a range of academic staff from science, humanities and social science and the professions.

3.1 Interviews with senior executives

The principal author (AZ) conducted hour-long individual interviews with members of the senior executive team charged with responsibility for managing, guiding and shaping the research and teaching activities within the institution. The focus of these interviews was to determine the way in which these senior staff conceptualised the nexus and how their views shaped policy and practice within the institution.

Views were sought on a range of issues and matters including:

- why it was considered important to strengthen the nexus within the specific institution and, by implication, within universities generally;
- how key papers (such as those emanating from the Carnegie Foundation and Pew Trust), internally commissioned projects and other research were used to guide thinking and strategy within the institution;
- current strategic initiatives directed at strengthening the nexus both directly and indirectly; and
- institutional and wider policy impediments to achieving a stronger nexus.

Each person was given in advance a written outline of the purposes of the study, together with some framing questions and issues to use in preparation for the interview. Detailed notes were taken during each interview and amplified immediately afterwards. The relevant sections summarising the data from the interviews and document analysis were returned to the respondents for comment and amendment.

3.2 Document analysis

The second component was an analysis of key policy documents and other discussion papers that should, in principle, reflect the nexus in operation within the institution. Key policy documents included Mission and Vision Statements, Teaching and Learning Plans, Research and Development Plans, Promotion policies and Appointments policies. The focus here was to determine where and how these policies strengthened or monitored the nexus, and where they might impede a nexus.

In the first pass through the documents, key phrases were identified including references to 'scholarship', 'teaching and learning' and 'research' and coded for source. In subsequent passes the data were cross-coded so as to permit comparisons for policy consistency within institutions. Detailed notes were made of how the policy addressed the nexus. The coding processes were designed to establish an 'audit trail' for data selection, validation and interpretation.

3.3 Case vignettes

From the literature review we have noted that, typically, rewards for achievement and quality in teaching and research reinforce a perception that teaching and research are distinct activities with specific amounts of time allocated to them. (For example, see Colbeck 1998.) However, many academics continue to hold the view that good teaching must be informed by research, while Hattie and Marsh (1996, p. 533) argue the need for 'demonstrations of the integration of teaching and research.'

The case vignettes provided an attempt to explore the diversity of staff endeavours across the three universities. The cases were selected to highlight some different ways in which staff demonstrated or struggled with the nexus in their scholarly work. We were optimistic that in seeking examples of what was occurring in each of the three universities and across a range of disciplines, we would more fully understand the complexity of the relationships between learning, teaching and research as reflected in academic work practices.

Undergraduate and graduate students are expected to master a complex range of intellectual skills. As we have noted earlier, in their graduate profiles each of the universities includes statements that refer (albeit not in exactly these terms) to developing in students an ability to conduct research; to critique the research of others; to appreciate the ethical dimensions of their discipline; and

to develop broader skills of scholarship. It is hard to imagine how these outcomes can be achieved without staff focusing on the nexus.

Part of our motivation for using case vignettes in our approach stemmed from hypotheses that:

1. student learning at all levels could be enhanced where the teaching/research links were made explicit; and
2. staff might be able to make more effective uses of their time by adopting a less polarised view of their work (i.e. not assuming that time spent on teaching is time that is taken away from research).

We thought that case vignettes might allow us to explore staff perceptions regarding:

- the valuing of teaching as a scholarly activity;
- the extent to which staff were influenced in balancing their work practices by institutional policy initiatives or other factors. How powerful were these as drivers? Were other reasons given?
- impediments to a stronger nexus; and
- how these impediments might be addressed.

This study adopted a situational perspective by examining questions such as ‘How do university, departmental and disciplinary contexts influence the ways in which and the extent to which individuals and groups integrate teaching and research?’ Within each of the three universities, we identified academic units (Schools and Departments) in three broad groupings—the sciences, humanities and social sciences, and the professions—to see how staff were integrating teaching and research. We were especially interested any evidence that teaching and research interact to enhance learning. This would give support to Brew and Boud’s (1995) idea that teaching and research are similar processes in that both involve learning, discovery or knowledge construction, and are therefore inseparable.

Many of the academics we spoke to believed that an understanding of how knowledge is created is a fundamental part of what an actively involved researcher or scholar can teach. Critical enquiry is important in this process, presenting to the student an unveiling of the construction of knowledge. Teaching well done makes explicit for students some of the relationships between enquiry and knowledge.

Identifying subjects and departments/schools for the case vignettes followed the same pattern in each university. The Deputy Vice-Chancellors and heads of staff development units in each university were asked to identify academic units (Faculties, Schools and Departments) that might be approached to provide useful perspectives on the nexus. Some academic units were

specifically selected because of exemplary practice; others because they illustrated particular problems or impediments. In order to make some comparisons across broad discipline areas, it was decided to identify at least one unit in each university within the broad areas of sciences, humanities and social sciences and the professions. The sample of academic units is neither representative nor random. It is purposive sampling. We were not able a priori to specify what should be specifically controlled or even exactly what should be studied. In this naturalistic enquiry, not knowing the precise form of the data that would be collected, we needed an approach that would provide flexibility and adaptability within the interviewing and documentary analyses. The case report is well suited to this exercise. It makes contact with the informers' own tacit knowledge of the situation. Provided meaning and interpretations are negotiated with respondents, one can meet criteria for trustworthiness within the enquiry. (For a fuller description of this form of 'natural' enquiry see Lincoln and Guba 1985, pp. 39–45.)

Prior to contacting staff, the principal author (who was also the interviewer) wrote to each of them to outline the purposes of the study and to seek their willingness to participate. No one refused. Before each interview, information about the study and some research and interview questions were sent to each person. The semi-structured interviews, lasting one hour, took place in the participants' offices. Extensive notes, including verbatim statements, were taken during the interviews and the notes amplified immediately after each interview. In the course of the interviews participants were asked how they viewed the relationship between teaching and research in their discipline and how this was reflected in their approaches to teaching, time allocation and the management of their research programme. Other questions and lines of enquiry emerged from the specific context of the interview. 'Emergent design' is a feature of this type of naturalistic enquiry. The research design and analyses unfold from interaction with the study (Lincoln and Guba 1985, p. 42).

No attempt was made to force the respondents into particular modes for responding. Rather the interviewer followed the leads and directions each interviewee provided and explored those dimensions with the respondent. The respondents were prompted to provide examples of where and how research influenced approaches to teaching and where, if possible, they could identify teaching influencing research. A summary of the interview was given to each interviewee to check both the accuracy of the data and the appropriateness of the interpretative comments. The few minor differences were resolved satisfactorily through discussion. All interviewees assented to including their case vignette in the analysis and final report.

The case vignettes from each university are in the Appendices. They were drawn from staff in the following units:

UWA	Ballarat	Curtin
Graduate School of Education	Business	Science and Mathematics Education Centre
Medicine	Information Technology	Social Work and Social Policy
English	School of Behavioural Sciences: Rural Social Welfare and Sociology	Biomedical Sciences
Politics	Environmental Management	Applied Chemistry
Law	Nursing	Research Institute for Cultural Heritage
Agriculture		Curtin Business School
Anatomy and Human Biology		

Also included for study were two institutional initiatives from the Deputy Vice-Chancellors' Offices at the University of Western Australia (Teaching Fellowship Scheme) and Curtin University of Technology (Learning Effectiveness Alliance Program or LEAP).

4. The nexus within the University of Ballarat

4.1 Brief history

The University of Ballarat was the outcome of a complex series of amalgamations that included principally the Ballarat School of Mines, Ballarat Teachers' College, and Ballarat Art Schools. Changes through the 1960s and 1970s led in turn to the establishment of Ballarat College of Advanced Education in 1976; the Ballarat University College (and its formal affiliation as a College of the University of Melbourne) in 1990; and finally the creation of an autonomous University of Ballarat on January 1 1994 (Sunter 1994, pp. x–xi).

As Ballarat University College (BUC) with its affiliation to the University of Melbourne, BUC began the process of developing its research and the supervision of students seeking higher degrees. Over the last decade the institution has gradually moved away from being one hampered by the legacy of Colleges of Advanced Education—large amounts of face-to-face teaching of a traditional classroom kind, too many exams, and too many units—to one where staff are involved in publication and research activities. In 1992 and 1993 the initial professorial appointments were made. At first higher degrees offered at Ballarat were University of Melbourne higher degrees, but from 1993 Ballarat offered its own higher degrees by research. Melbourne agreed to continue to assist the University of Ballarat to develop research expertise through a vigorous research audit processes of existing and potential research strengths and by identifying and targeting niche areas where Ballarat could develop its own research and higher degree strengths (Sunter 1994, pp.158–172). In short, it is a relative newcomer among Australian universities both to research and higher degrees.

4.2 The nexus as an indirect relationship mediated through scholarship

The University of Ballarat supports an indirect view of the teaching/research relationship and casts the work of academics under the term of scholarship. In 1986 Elton strongly advocated this view of the nexus. He defines scholarship as producing 'new interpretations of what is already known',

placing it as the third main field of university activity, linking teaching and research:

The way forward for universities is not to be divided into teaching and research institutions, but to make sure that scholarship flourishes in them all and supports both teaching and research. What is needed is a quite radical change in the value system of universities, giving value to excellence in teaching, scholarship and research, and a much greater differentiation of function between different academics (p. 304).

These views of Elton's preceded the broader framework of 'scholarships' described by Ernest Boyer which were adopted as a starting point for policy development within the University.

4.3 Developing scholarship, research and student life: Boyer's four scholarships

Early in its life as a University, Council established a Working Party on Developing Scholarship, Research and Student Life. Its challenge was 'to address some of the central roles and purposes of the university'. The working party began by considering whether research, scholarship and student life were to be regarded as entirely separate or as different aspects of the same issues. In 1997 the Working Party decided to define and develop its work in terms of Ernest Boyer's four interrelated forms of scholarship (Boyer 1990). They identified ways in which each of the four kinds of scholarship involved practices and relationships that connected members of the University with particular groups inside and beyond it. They saw that outside forces such as technology and globalisation were already impacting upon scholarship, practices and relationships within and outside the academy. Thinking about how to engage with these forces productively was a possible means of shaping the future of the institution. So while focusing on ways to strengthen the research culture of the University, the Working Party simultaneously focused on ways to strengthen contributions to, and connections with, business, industry and the various communities it served (regionally, nationally and internationally). They incorporated Boyer's notion of the engaged campus pursuing scholarly work that addresses the most pressing problems of society. Good teaching is still crucially important, and research is certainly part of this work, but the emphasis is on research that plays a role in serving the needs of the region.

The working party took the view that scholarship and research should be considered together, in keeping with Boyer's four-fold view of scholarship.

Rather than accepting the usual categorisation of academic work into teaching, research and community service, the University has followed the suggestion of Ernest Boyer that scholarship as a whole has four aspects all interrelated and in different proportions at different times:

1. *The scholarship of teaching (or discourse)*
2. *The scholarship of application*
3. *The scholarship of integration (or synthesis)*
4. *The scholarship of discovery.*

Developing Scholarship, Research and Student Life 1997, p. 4

The University has thus sought to define itself as a place where the four scholarships thrive and are valued. The Working Party identified ways in which Boyer's scholarships could foster practices relating members of the University community to one another and to people outside the University. In the Ballarat context this means:

1. *The scholarship of teaching* involves practices of teaching and learning and relationships that connect teachers and students.

It involves practices of communication which engage teachers and students in a permanent struggle with texts—in acts of speaking and hearing, and reading and writing, which leave their traces not only in the minds of students and teachers but also, by accumulation, in the public record which constitutes a field, a discipline or profession.

It takes an active view of teachers as people continuously developing their scholarship of teaching. On the one hand it views them a lifelong students of their specialist knowledge of their fields; on the other hand it views them as lifelong students of teaching.

It also takes an active view of students. On the one hand, it views them as learners who participate actively in their construction of their own practices of learning—not as passive recipients of knowledge, as if knowledge were only an adornment, possession or competence. On the other, it views students as the rising generation of scholars who will take their turn in preserving and developing knowledge and scholarship in their fields—as heirs to the stewardship of their teachers.

2. *The scholarship of application* involves practices of professional and community work, and social relationships which connect members of the scholarly community of the University with the whole variety of individuals, organisations and enterprises.

It involves partnerships and alliances and practices of communication, beyond the University, focused on contemporary problems of practical

economic, cultural, social and environmental significance outside the University. Because it engages problems of practical moment and significance, the scholarship of application frequently rebounds on the other forms of scholarship, requiring further research, further education, or further integration with knowledge across the boundaries of fields, disciplines and professions.

3. *The scholarship of synthesis* involves practices and social relationship connecting members of the University with one another, with peers in the scholarly communities of our disciplines, fields and professions, and with peers in the wider communities of which we are citizens. It involves hearing and appreciating contributions and perspectives of diverse people and groups, and so scholarship, specialisms and specialist knowledge can be submitted to general critical scrutiny.
4. *The scholarship of discovery* involves practices, special relationships and connections between people whose work constitutes the knowledge of the discipline, field or profession. On the one side, it focuses on the current research activity and practices of communication by which new contributions are added to the public record of a field; on the other hand, it implies a thorough grasp of how the public record stands—the existing knowledge of the field, and the intellectual traditions which constitute it (pp. 5–6).

Taking Boyer's four scholarships as a cue, we can begin to evaluate aspects of student life: we can think about how student life at the University of Ballarat fosters the values appropriate to integration, application and discovery, as well as teaching. And this means thinking about how student life at the University of Ballarat creates opportunities for interaction and connection with peers and the wider public (the scholarship of integration), with business, industry and the wider community (the scholarship of application), and with others contributing to knowledge and research in one's own field (the scholarships of discovery). Some of the new developments in teaching at the University create such opportunities: for field research by students on projects of real significance to the regional community and local enterprises, and involvement in community activities (p. 8).

4.4 The regional context

Ballarat is a regional university with a strong commitment to regional growth and development; to identifying regional advantages; and to creating opportunities for the Victorian Goldfields Region to grow and prosper. The Vice Chancellor, delivering the Alexander Oration in 1997, pointed out:

The partnership between the University and the community must be one that expands the wealth generation capacity in the community, which increases the opportunities for employment and which brings benefits to both parties involved. Expanded and continuing learning is increasing at the centre of the capacity of a community to generate wealth. The University is an enterprise the core business of which is teaching and learning. A partnership that matches the core skills of the university with the needs of the community will ensure that the impediments of the 21st Century can be converted to opportunities for us all

(James 1997).

The University is also a central player in developing a vision of Ballarat 2010 as a Learning City in the tradition of many European and North American cities—‘an exemplar of enterprise and technological knowledge and where innovation, wealth creation and excellence thrive alongside the city’s rich legacy of history and heritage’ (Ballarat Learning and Business Links Partnership 1999).

Boyer’s four scholarships and regional engagement are key foci for the University of Ballarat. It was against this backdrop that analysis and interpretation of key policies and practices affecting the teaching-research nexus was conducted. Although the University refers to Boyer’s Scholarships and uses these as an integrating framework encompassing research, community service and teaching and learning it nonetheless has developed a Research and Management Plan and is currently developing a Teaching and Learning Plan.

4.5 Strategic initiatives

The document analysis revealed many ways in which the University’s policies were directed to strengthen the nexus. Many strategies specifically link to tasks confronting a new university building a viable research culture while maintaining a strong focus on undergraduate teaching and community service. With a restricted resource base, the University was not in a position simply to purchase research expertise. Several key strategies are identified within the Research and Management Plan.

- *Improving postgraduate teaching and training*

Although the Research and Management Plan focuses primarily on the scholarship of discovery the authors note that:

it is integrally linked to the scholarships of application, integration and teaching. This is particularly so because of the University's commitment to increasing the number of research-active staff and research postgraduate students. Postgraduate teaching is a very significant part of the University—and therefore of this plan (p.4).

- *Creating UB teaching/research fellows*

These fractional Level A appointments provide career opportunities for appropriately qualified and motivated staff to enable them to learn about and contribute to the teaching and learning role of the University while simultaneously undertaking advanced research training.

- *Establishing a Graduate Centre*

The Centre provides a focus within the University for researchers and research students to meet and participate in seminars, a place where experienced researchers have opportunities to pass on their knowledge, skill and wisdom (p. 8).

For Schools that lack a critical mass of research-active staff or include only small numbers of research students, such a Centre becomes a key focal point.

- *Increasing the number of overseas visiting research fellows*

Such short-term appointees, from elsewhere in the world, have a primary responsibility to model research excellence for staff and research students. They assist in the postgraduate teaching effort and in staff development.

- *Providing staff development*

This is reflected in several strategies including promoting effective postgraduate supervision and providing effective seminar and workshop programs through the Graduate Centre.

Staff development is a central feature of the drive to improve the quality of organisational performance. Many universities provide informal staff development activities. The University of Ballarat has made a strategic and pedagogical decision to provide formal award courses as the cornerstone of educational development programs for staff. Scholarship and Educational Development Services (SEDS) run these courses.

- *Providing incentives for both conference presentations and publication*

Support is available for postgraduate students to present papers at national and international conferences and publish in refereed journals during higher degree programs.

4.6 The nexus in undergraduate education

As Ballarat clarified its mission and aligned its resources to achieving this mission, it engaged in wide-ranging discussions on how it might operationalise the four scholarships by recasting Boyer's conception in terms of the kind of communication and connections that linked the University to its community (Operationalising Boyer's Four Interrelated Scholarships in an Australian University 1997). A working paper identified under each scholarship examples of work and work partners. Schools have variously adopted and adapted this framework in constructing and reviewing their undergraduate programs.

The case vignettes reflect some of the diverse approaches Schools have used as they reduce the number of units and the amount of face-to-face teaching, incorporate enquiry-based learning, and integrate research with teaching and community service programs in all years of undergraduate study. The focus on the four scholarships provides scope to approach teaching and learning in varied ways. Concomitant changes to the promotion criteria explicitly value and reward this diversity and innovation. It was also clear from interviews that significant numbers of students have 'capstone experiences' in their final year of study and that these experiences have potential benefits for students, staff, the University and the community. (See for example those described for Environmental Management, Rural Social Welfare and Sociology.) The students' projects, supervised both by staff and community professionals, embed the University within the region in significant ways.

4.7 The nexus in postgraduate education

Much of the current focus and growth in postgraduate education is through coursework Masters degrees and professional doctorates. Postgraduate research degrees pose particular challenges for the University. Schools such as Nursing have very few staff with experience in supervising research students, since many of them have only recently completed their own PhDs and the demand for research degrees in the profession remains quite small. Here, and in the School of Business, a staff member has been specifically appointed to assist staff to publish and to develop their proposals and supervisory skills.

In IT, high quality research supervision is available but there are few incentives for students to undertake higher degrees by research. The lure of high salaries quickly pulls graduates into industry or other employment. IT is one area where University staff are engaged in the scholarship of discovery, but where they can only maintain this scholarship insofar as it incorporates undergraduate and postgraduate students through both teaching and supervision.

In Behavioural and Social Sciences, postgraduate students (many studying part time) are largely professionals employed in regional social service agencies who undertake projects related to their areas of work. In these cases too, there is an entwinement of teaching with community service and research. Students are attracted into higher degree programs from their close connections with University staff on other projects. A relatively large amount of contracted research (through consultancies) is conducted in the University and this is an integral part of several schools' activities. However it is thoroughly embedded with teaching and community service and is the means whereby staff remain connected with their fields.

The few research-only staff are found working on industry-funded projects, such as that undertaken within the School of Environmental Management. At present, under the conditions of the contractual arrangements for these projects, there are no obvious ways to integrate these staff more fully into the roles of the University, and they do no teaching or supervision.

4.8 The nexus in relation to general staff

The University is interested in the relationship between the work of academics and that of administrative or general staff whose work also involves elements of scholarship. University documents note that:

For instance, facilitating the development and adoption of a University policy usually involves some research (or at least the synthesis and application of others' research), succinct and accurate writing, and the oral defence of such writing in such testing environments as meetings of senior managers and the University Council. The scholarship of discourse becomes as important as policy is implemented, as is the scholarship of discovery, as implementation is monitored with a view to improvement of both policy and implementation.

Even where there is no direct involvement in scholarship among the general staff, the whole purpose of their work is to support the scholarship of others. It seems an obvious point to the senior managers of this University that such support will be more effective if the staff providing it have a sound appreciation of what is involved in scholarly work in an academic environment.

Operationalising Boyer's Four Interrelated Scholarships in an Australian University
1997, p.1

4.9 The nexus in relation to student life

*Within the small world of our University, we are committed to improving the quality of **student life**. This is implicit in our commitment to the four scholarships. The kind of life students lead in a university reflects the way the university sees its role in drawing them into scholarly life—both as members of the University’s scholarly community, and as scholarly members of their various communities beyond the University.*

Developing Scholarship, Research and Student Life 1997, p.7

For the University, this is not merely about ensuring that students are satisfied ‘customers’ of the University programs, services, and extra-curricular activities.

It is a matter of fostering forms of life which, at their centre, promote and defend scholarly values of reason, tolerance, civility, mutuality, reciprocity, trust, respect and affiliation (a sense of belonging).

Its commitment to scholarly values like these compels the University to have a deep interest in, and care and concern for, its students. It exhibits this concern not only when students are in classes or the Library, but also when they participate in a wide variety of student activities the university itself supports; not only when students are ‘in role’ in their ‘working hours’, but also in relation to their lives as persons learning scholarship and scholarly values; not only when students are on University premises and in University residences; but also as rising generations who will take their turn in ‘keeping the flame of scholarship alive’ (as Boyer put it) in circumstances and settings beyond those of the here and now.

The University of Ballarat, because of its size and location, can give students a sense of belonging in ways larger, metropolitan universities may not easily match. But this may mean that more is demanded of our University than of others in terms of the way we practice affiliation, and how we use it in fostering the practices and culture of scholarship (pp. 7–8).

4.10 The nexus in regional links

Unlike their American counterparts, Australian regional universities are a unique resource largely unused by the regional communities to which they belong. As the Vice-Chancellor, Professor David James, has observed, globalisation and the uses of technology will put increasing pressure on

regional universities to survive. Shaky financial underpinnings, shifting curricular perspectives, unpredictable social needs: this new environment requires universities to rethink the patterns of work and institutional organisations that have been established. But further more far-reaching issues arise when we contemplate the profound changes that electronic resources will bring to universities and the roles of academic staff in the production and dissemination of knowledge. These sorts of changes make it essential for regional communities to use their local universities as a resource in their own development and reshaping activities.

The University thus has to be highly pro-active in facilitating links with its region and in establishing partnerships that draw upon the University's capacity for teaching and training, scholarship and community service. One key endeavour is *Vision 2010—Ballarat as a learning city* (Ballarat Learning and Business Links Partnership 1999). This concept builds upon Learning Cities and Learning Communities already established in North America and Europe. Although no two such cities are identical, they all build upon basic tenets of economic regeneration, democratic participation and social inclusion. Partners in such projects usually involve local Government, education and training providers, local business and community groups. The University envisages such a project as drawing upon all the Scholarships through, for example, writing histories of the region and establishing local museums (Discovery); a range of courses provided through the establishment of learning centres which are community owned but associated with and supported by the University (all four); or resources to build better business competitiveness, innovation and technology development (Integration and Application).

4.11 Impediments to the nexus at the University of Ballarat

Impediments to the nexus in a university such as Ballarat are quite different from those of a research-intensive university. Some are obvious—others more subtle.

1. The small number of research-active scholars

Despite the very broad definition of scholarship and scholarly activities encouraged within the University, there remain staff who have yet to engage operationally in what Boyer means for them, their work and the Schools. Those Schools with strong scholars contribute significantly to the Research Committee and to the activities of the Research Office, and offer exceptional research leadership to the University. Understandably these

scholars also have an interest in building up their personal and school profiles and need to balance the commitment to their own discipline areas with those of the University. It is hard to create critical clusters of scholars in all Schools. Some single-minded individuals (such as Professor Binh Pham in IT) have done so, but at considerable cost to the culture and development of the School.

2. Developing supervisory capacity using a range of 'real-world' research methods

An allied problem is that of developing supervisory capacity. Graduate students are attracted to capable supervisors who they know will mentor them through their graduate experiences. Postgraduate course-work degrees and professional doctorates that allow students to research their practices are attracting students working in professional areas. However the type of supervision needed for their projects demands that staff understand and use varieties of 'real-world' research methods that often extend well beyond their own recent higher degree research preparation. A focus on diverse research methods is a key challenge for the small Graduate Centre.

3. Teaching-only staff

One legacy of Ballarat's history of amalgamations is a pool of staff whose expectations of academic work are limited to teaching without necessarily also an appreciation of undertaking teaching in scholarly ways or the ways needed to prepare students for their uncertain and diverse futures. This places considerable obligations on the University to offer, perhaps even mandate, minimum levels of professional development.

4. Sustaining opportunities for student and staff community project work

Clear advantages stem all round from students and staff undertaking 'real' community-based projects. They are among the best illustrations of the nexus. It is especially important that these opportunities are sustained, for they are one major distinctive advantage of an education within a regional university. As pressures mount on academics and resources within the University, the preservation of these activities may require strong advocacy.

4.12 Summary

As a new and regional university, the University of Ballarat is still defining its position. This is no easy task in the current climate of change within higher education nationally and globally. At Ballarat the social and political pressures emanating from Australian regional communities compound the process. Instead of conceptualising academic work as three competing forces—

teaching, research and community service, this University has embraced Boyer's four-fold notion of scholarship. For the University, this integrating framework lends both purpose and direction to all its activities, at every level within the institution—schools, faculties and centres, and to the broader community of learners and partners. Scholarly activity in all its diversity is the nexus.

Training our sights on scholarship also encourages us to find new ways of understanding universities, helping us to remain open to new ideas and committing us to making shared sense of the experience of inquiry that connects us in terms of external relations, for instance via service to the professions, and in terms of internal relations, primarily through the practice of internal debate.

University of Ballarat Submission to the Review of Higher Education Financing and Policy 1997, p.33

5. The nexus within the University of Western Australia

5.1 Overview of the University

In its key role statement, the University of Western Australia, one of the eight so-called 'sandstone' Australian universities, describes itself as 'a high quality, medium-sized university with a broad and balanced coverage of disciplines in the arts, sciences, humanities and major professions. It is characterised by a strong research and postgraduate emphasis linked to a high quality undergraduate education, across a range of disciplines; by selected areas of research concentration; and an international focus for its activities and standards.'

The University of Western Australia is committed to the values it believes to be a hallmark of a leading university—continuous improvement in all areas; creating a learning environment for staff and students, which emphasises students and staff are partners in the learning process; maintaining a high performance culture; and improving the quality of the experience at university. The importance of the relationship between teaching and learning and research is a major underlying premise of this document. As a research-intensive university, it is integral to UWA's role that teaching and learning takes place in an atmosphere and culture of research and scholarship.

Introduction to the Teaching and Learning Management Plan 1998 [Emphasis added]

The University fosters a strong interrelationship between teaching and research, which is given expression in the composition of the student mix, the University's teaching and learning objectives, its academic staffing policies, and its resource allocation processes.

Teaching and Learning Management Plan 1998, Section 2

Teaching that is informed by knowledge gained by research and by the flow of information through international research networks is essential to maintaining the University's standing as an internationally competitive university. The nexus between teaching and research is evident University-wide in a number of long established practices. For example, postgraduate research students are used by departments as tutors and demonstrators; active researchers—research staff, research fellows and visiting scholars—

are employed as lecturers and tutors in undergraduate units and as supervisors of honours, masters and doctoral research candidates. The teaching and research nexus is clearly evident in the practice of research supervision in which teaching and research are fully integrated.

Teaching and Learning Management Plan 1998, Section 4.4

This integration is reflected also in the Research Management Plan.

Education that allows teachers and students to participate in research develops the love of knowledge, the respect for accuracy of thought, the refinement of technique and the power of critical analysis essential for true scholarship.

Teaching that is informed by knowledge gained by research and by the flow of information through international networks is essential to maintaining this University's standing as an internationally competitive university.

Introduction to the Research Management Plan 1998

Among the key objectives and strategies within the planning framework for research are:

to offer high quality research opportunities, leadership training and supervision at honours and postgraduate level in all discipline areas; to provide high quality undergraduate courses and teaching in which students gain an appreciation of the value of research and scholarship; and to provide opportunities for undergraduate students to participate in and be exposed to original research as an integral part of undergraduate curriculum.

Section 2.1 Research Management Plan 1998

Senior staff within the University espouse a direct relationship between teaching and research. Simply expressed, this belief in a direct relationship is that, wherever possible in a research-intensive university, research cannot and should not exist without teaching, and vice versa. For the institution to be worthy of its role in higher education, not only should research and teaching both take place at the highest level, but they should feed off and mutually reinforce each other. Students are seen to be short-changed if they are not learning from lecturers working at the 'frontiers of knowledge', while researchers are hardly worth their salt if they are not regularly reporting back their latest findings to postgraduate and upper level undergraduate groups. A research-intensive university has the capacity to enrich experiences for all students in each discipline and profession offered. A commitment extends

throughout the University to teaching and research as the core activities. Service, while valued, is something staff engage in to a lesser extent where they have opportunities for and interest in doing so.

5.2 The teaching-research nexus working party

The Teaching and Learning Committee (TLC), chaired by DVC Professor Alan Robson, currently plays a major strategic role in strengthening the nexus within this University. Much current activity of this Committee is directed towards ensuring that staff and students fully benefit from the opportunities potentially afforded through the research-intensive environment. One primary aspect focuses, therefore, on appropriate ways to bring scholarly enquiry and primary research findings into the design and delivery of the undergraduate curriculum.

The main strategic focus is on undergraduate teaching. The University recognises that the association between staff research and teaching at postgraduate level is perhaps more self evident, although still requiring scrutiny. At undergraduate level developing an effective nexus is more problematic. Linking policy to changes in teaching practice that make for an effective nexus at undergraduate level is both an important and difficult task. The issues identified and analysed here are also highly relevant to the growing range of postgraduate courses.

During 1998 the TLC established a Teaching-Research Nexus Working Party with the DVC as convener. The purpose of the Working Party is to examine issues related to the nexus between teaching and research, including particularly the recommendations of the 1998 Boyer Commission Report, *Reinventing undergraduate education: a blueprint for America's research universities*. One aim of the Working Party is to take Boyer's definition of the 'scholarship of discovery' and make certain that it is translated into action in ways that ensure that UWA's undergraduate students benefit from the unique opportunities and resources available in a research-intensive university.

This particular Boyer Commission Report (for there are several) identifies ten fundamental ways to change undergraduate education in American research universities. They are:

- I Make Research-Based Learning the Standard
- II Construct an Inquiry-Based Freshman Year
- III Build on the Freshman Foundation
- IV Remove Barriers to Interdisciplinary Education
- V Link Communication Skills and Coursework

- VI Use Information Technology Creatively
- VII Culminate with a Capstone Experience
- VIII Educate Graduate Students as Apprentice Teachers
- IX Change Faculty Reward Systems
- X Cultivate a Sense of Community

However, the Working Party has noted that there are clear and significant differences between the American and Australian university systems. In many American research universities, including the most prestigious in the country, the bulk of first-year teaching is done by graduate teaching assistants and students may have little contact with the professors whose names are linked with the institution's prestige. The situation with respect to undergraduate teaching in Australian universities is therefore not as dire.

5.3 The nexus in undergraduate education

The Working Party subsequently proceeded to audit the nexus through departmental submissions on Enhancing Teaching Quality (ETQ). Although the ETQ submissions asked departments to report on teaching, rather than on the teaching-research nexus, it was clear that many departments already include aspects recommended within the Boyer Commission report. Examples of these activities are given in the interviews conducted with staff across various Faculties and Departments for the UWA case vignettes. (See Appendix B.) Problem Based Learning approaches being used in Medicine are a prime example of making research-based learning the standard—one sustained throughout the degree program. Anatomy and Human Biology incorporate web-based instruction and CD-ROMs in Histology alongside microscopes and sections. All fourth year Agriculture students undertake a major independent research project (a 'capstone' experience). Third year Political Science students work on public policy in a State or Commonwealth Government department, in Parliament, or with a policy bureau. Such experience sharpens their communication skills both for course work and subsequent employment. Law students have opportunities to engage in service learning.

Finding examples of the nexus at undergraduate level (whether at UWA, Curtin and Ballarat) is not difficult. Determining what is both realistic and ideal as a nexus within undergraduate education is much more of a challenge for universities. This aspect is discussed in detail in Chapter 7. For example, some department heads believe that introducing a requirement for a 'capstone experience'—where all undergraduate students in their final year of study (not just those undertaking Honours) undertake a substantial piece of independent

project work amounting to not less than 25 per cent of their assigned grade—would place inordinate pressures on some departments, unless they were given additional teaching resources. Providing a ‘capstone experience’ in a three-year degree program would, in the view of some department heads, not be feasible because of the supervision demands.

5.4 The nexus in postgraduate education

Postgraduate education and training are a particularly important part of the University’s academic profile. Research supervision probably best illustrates the nexus in a research-intensive university, but, ironically, fits uncomfortably with the University’s current reporting processes for both teaching and research. As one senior academic observed, it was impossible to know where to put postgraduate supervision when preparing materials both for teaching excellence awards and promotions. His solution was to refer to his teaching portfolio as a teaching-and-supervision portfolio, since a considerable amount of his teaching was postgraduate supervision. In another Faculty, the head of department encourages staff applying for promotion to emphasise supervision as research activity, in the belief that it is more highly weighted than it would be if recorded as teaching.

5.5 Strategic initiatives

Although postgraduate students at UWA undertake relatively small amounts of teaching, and most of it is tutoring and demonstrating, this teaching puts them in close contact with undergraduate students. These small group encounters are especially salient for early-years undergraduate students who might otherwise be in large lecture groups. So the quality of the teaching and learning in small groups can vastly shape their undergraduate experiences. A new strategic initiative called the Teaching Fellowship Scheme commences in 2000. The scheme will provide promising postgraduate students with opportunities to develop teaching skills in their field and to undertake a program of professional development during their PhD candidature. It is congruent with the Boyer Commission recommendation VIII.

While research activity and training are built into aspects of undergraduate education, notably through Honours degrees, such activity is principally provided for through postgraduate studies including PhDs, professional doctorates, and Masters degrees. The long term objective is to maintain a ratio of 25 per cent postgraduates to 75 per cent undergraduates with an emphasis on students undertaking higher degrees by research. High quality supervision

is clearly the key to success here. For heads of departments this is not merely a matter of referring staff to guideline documents, but of active mentoring and support as junior faculty take their first postgraduate students through the processes of degree completion. Students are also actively supported through skills support programs offered through their departments, faculties and Learning Skills Advisors.

If supervision best illustrates the nexus, then one clear challenge to the nexus in postgraduate education and supervision arises when staff retire or resign. Are students simply transferred to a new supervisor? Do they transfer their enrolment? Do they drop out? How do moderate-sized research-intensive universities maintain sufficient program diversity within their postgraduate programs to remain attractive and viable? Here the University has supported faculties and departments in a number of different initiatives including visiting overseas scholars in specialty areas. These scholars may teach, supervise postgraduate students and undertake collaborative research with University staff, which in turn allows UWA teachers to contribute to new areas within their departments.

For the Faculty of Education, new opportunities to strengthen the nexus at postgraduate level have come from another source—in this case overseas students. Teaching overseas students, especially those located in other parts of the world, has led the staff to research their pedagogical approaches and curriculum design. As is the case for some examples from the University of Ballarat, it illustrates the integration of teaching, research, supervision and extension service.

5.6 The nexus for general and support staff

Although the nexus is usually conceived of as applying to academic staff and students, it clearly does not stop there. In discussing Scholarship at Work at UWA¹ the authors identify ways in which general staff can also engage with each of Boyer's Scholarships of Discovery, Integration, Application and Teaching. The article poses the question (and implies a challenge) to staff: Are we, all staff and students, a community of scholars?

5.7 Impediments to the nexus at UWA

All institutions face impediments to the nexus. In its attempts to strengthen the nexus, the University is addressing the following:

1. Research-only staff

Between 1993 and 1997 the number of teaching and research staff increased only marginally, from 700 to 703, while the number of research-only staff increased by 61 per cent from 179 to 273. To a large extent this reflects the University's success in broadening its funding base through success in gaining external research funding. But it also means a significant and growing proportion of academic staff is not employed to teach. A significant challenge is to integrate these research-only staff into the University's teaching and learning activities. A Working Party is currently exploring how this might occur.

2. The isolation of some research centres

Allied with the issues of research-only staff is the role of Research Centres. How much research activity is located in and, more particularly, restricted to Research Centres? And, what is a Centre? Some Centres contain a single individual or two who have become 'quarantined' from broader departmental activities. Others, especially some of those in Medicine, are complex, large million-dollar-plus enterprises with significant numbers of postgraduates and postdoctoral fellows. Centres have the potential to segregate teaching and research, except through research supervision. If postgraduates and the University community are both enriched by being involved in a whole range of departmental and University activities, how is this best effected?

3. The specialised type of research undertaken within a department

Research across the University takes many forms. In some departments research is very highly specialised and to understand it students need to be well advanced/in their grasp of the discipline, skills and techniques. This is especially true in some areas of science, biomedical sciences and engineering. Reflecting the research-intensive nature of the University by approaching the curriculum from an enquiry basis is not an issue. Integrating current research of this type into the undergraduate curriculum is. If strengthening the nexus means helping undergraduate students to appreciate how to ask questions that lead to good answers, it can be done, but not necessarily through illustrations of personal research in progress.

A focus within some science departments is on the selection of excellent researcher/teachers whose breadth of understanding allows them to talk interestingly and authoritatively to undergraduate students about new areas e.g. genetic engineering or molecular biology. Students want people who can excite and stimulate their interest, especially when the material is challenging and effort sometimes difficult to sustain. The use of such teachers with first and second year undergraduates in particular is a good investment because it keeps students motivated, retains them and engages them in serious learning in disciplines where high quality graduates are few.

4. Strong disciplinary boundaries

The core academic units, the departments, are strong discipline-based entities. The various disciplines have well-established teaching units, research programs and relationships with their continuing students, all of which militate against collaborative and interdisciplinary work. Since many contemporary problems, and most interesting ones, are best solved when tackled through collaborative endeavours, how can the University encourage and fund such work? Does it do so through funding and grants, new administrative structures, cooperative teaching centres or other such initiatives? The increasing concentration on problem-based issues in professional education, especially at postgraduate level, may require many foci. The role of an integrating centre may be crucial to the success of such programs.

5. High research supervision loads

As is the case with many aspects of academic work, research supervision falls unequally across the University departments. Those departments with strong research, teaching and supervisory staff attract and retain their students. Undergraduate students bring basic funding dollars for running the department. Research students generate an important part of the research quantum. The demands of each group have to be balanced. Providing undergraduate students with a 'capstone experience' while sustaining high quality postgraduate student supervision is difficult for some departments. Unless the resources are there, the opportunity to undertake a supervised project would be restricted to the most able or highly motivated undergraduates.

5.8 Summary

The University of Western Australia is actively addressing the teaching-research nexus through a number of key strategic initiatives at both undergraduate and postgraduate levels. Systematic steps are being taken to enhance the quality of undergraduate education so that all students receive tangible and demonstrable benefits from being in a research-intensive university. The strongest nexus in the University probably occurs in research supervision. This being so, the quality of research supervision is a critical area to monitor. Postgraduates, like undergraduates, should be able to identify educational advantages from being in a research-intensive environment. The University is currently examining ways to remove possible impediments and create the community of scholars it seeks.

6. The nexus within Curtin University of Technology

6.1 Brief history

Curtin University of Technology was established on January 1 1987. Its origins (1900) were as a technical college before it became an institute of technology (WAIT) in 1967. It was first among the former Colleges of Advanced Education (CAE) to become a university—in this case a ‘University of Technology’. In the years since 1987 it has made rapid and substantial shifts in defining its mission, directions and core business, including research—but has retained a bent towards practical and applied learning.

The University’s Mission and Values document begins with a vision statement: ‘Curtin aspires to be Australia’s world-class university of technology.’

It proceeds to identify three focal areas for its mission and then to affirm the centrality and interlinkage of teaching and research:

- The search for innovative applications of technology to educational purposes and other social needs, emphasising continuous improvement;
- The cultivation of responsive and responsible links with the wider community, emphasising service, practical relevance, social justice and ethical behaviour; and
- The development of students and staff as citizens of the world, emphasising an international outlook, cultural diversity and an informed respect for indigenous peoples.

The Curtin community is united by a commitment to scholarship that embraces both teaching and research as complementary, interlinked parts of its mission. Accordingly the University’s main goals are to achieve excellence in:

- teaching and learning, which prepares graduates for lifelong learning and equips them to make a positive contribution to society
- research and development, particularly as a partner with government, commerce, industry, professional organisations, other institutions of learning and the community. (Emphasis added.)

As a University of Technology, Curtin has emphasised the application of research as a source of rooted benefits for the economy, the community and the teaching program. This context lends itself to embracing Boyer’s four scholarships (whether separately identified or not) in the University’s policies and practices.

6.2 Teaching, learning and research in the technological context

The business of a 'University of Technology' is interpreted within the framework provided by the first Director of WAIT, Dr Haydn Williams, as 'the application of creative thinking and ingenuity to the solution of definable and practical problems in all fields of human endeavour.'

Within this context the Boyer schema was introduced into this University's debates earlier in the 90s by Professor Lesley Parker (now Deputy Vice-Chancellor) in a paper that was discussed within the University's Teaching and Learning Committee and Academic Board.

In 1997, following the appointment of Professor Lance Twomey as Vice Chancellor, two new offices were created. One office is responsible for Teaching and Learning (T&L), the other for Research and Development (R&D). Each office is headed by a deputy vice chancellor.

Since moving into his new Deputy Vice-Chancellor (T&L) role in 1997, Professor Ian Reid has reinforced awareness of the Boyer schema as pertinent to the work of his Office and to Curtin's mission. In a report to Council on a study tour to various US universities and colleges in late '97, he drew attention to the fact that Boyer's broadened concept of scholarship had been taken up widely in North America. But in the Curtin context it is not Boyer's four-part model that is invoked. Instead,

the broad aim is for the University to provide a learner-centred environment in which teachers see their role as primarily that of scholarly resource specialists and professional mentors who help students to become independent in their ability to discriminate between data, information, knowledge and wisdom. Quality assurance needs to be focused on the concept of a community of learning, in which teaching is reconceived as scholarly work (cf. Boyer 1990) and learning is reconceived as the enhancement of adaptable literacies for a changing society.

Reid 1999, p.4

Rather than referring to Boyer's four scholarships per se, Curtin links R&D to T&L through the notion of scholarship, thus preserving the simple Curtin insistence (as in its mission statement) on there being two core academic activities that are complementary and interlinked.

The Research Management Plan (RMP) 1998–2000 reflects the links thus:

Curtin's R&D goal is as follows:

To carry out high quality R&D in order to increase knowledge and provide solutions to problems in diverse areas of human endeavour and, through action, results and marketing to establish Curtin's R&D position as one of 'Leadership in R&D solutions.' (p. 5)

This leads to a concept of research excellence that is outcomes-oriented and which emphasises the benefits to society. The more conventional research outputs (such as journal articles, citations, and grants) are seen as a means to an end and an indicator of performance, but not the end in itself. The store of wealth and knowledge that is created in providing problems to solutions is only one of the benefits offered to society. This definition also has due regard for stakeholders, since R&D will be focused on delivering value to those stakeholders, thereby providing a return on their investment.

As problems arise across the whole breadth of human experience, Williams' definition of the University's activities is by no means narrowing. It provides for involvement over a broad range of discipline areas and, indeed, highlights the University's multidisciplinary capability. Similarly, R&D can cover a broad spectrum, ranging from excellence in narrow areas of research to a broader, integrated approach which recognises strength and diversity and involves pooling of resources.

Williams' definition also has the advantage of not distinguishing between 'fundamental' and 'applied' research, in the conventional sense of these terms. Instead it encompasses all four of Boyer's scholarships: discovery, teaching, integration and application. The emphasis is on research that is necessary to address identified 'problems' rather than the intrinsic nature of the research itself. In this context it is important to note that the notion of 'solutions' and 'problems' does not preclude the advancement of knowledge as a valid 'problem' in human endeavour.

Within this broad concept of 'value', the beneficial impact of R&D is measured variously by:

- *the level of technology transfer to industry, business and the community*
- *advances in the discipline*
- *advances in teaching and learning*
- *knowledge generation and acquisition*
- *significance of problems addressed, and*

- *the quality of the processes, including management processes, which drive the research effort.*

*In the final analysis the important question is: **How different is the world as a result of the research compared to how the world would be without it?** (Original emphasis.) (pp. 5–6)*

6.3 Strategic initiatives

6.3.1 Placing learning first

Currently Curtin is reframing its educational programs in terms of concepts that place learning first—through its use of technologies; development of flexible learning, access and delivery; and emphasis on high quality learning experiences that are closely monitored, evaluated and improved. Policies, practices and procedures are all being evaluated on the basis of whether or not they promote learning. The initiatives are designed to:

- establish resources to support innovation and student learning;
- create a systematic program of outcomes assessment that gives academic staff the tools to compare educational programs and approaches and provides evidence of actual learning outcomes;
- explore and develop alternative scheduling patterns based on the needs of students;
- explore ways to reward innovations including academic rank tied to learning outcomes and rewards to teams who create successful learning outcomes; and
- identify and remove the barriers to successful student learning and innovation.

The aim is for students to be empowered to serve as ‘navigators’ of their own learning paths in a flexible and appropriate environment.

There is a strong view that universities saddled with old paradigms or insecure and reluctant staff and administrators will not be well equipped for the 21st century. The executive leadership team believes they cannot tweak old paradigms for incremental changes: only those institutions that are capable of swift and sometimes radical change will be in a position to respond to new opportunities.

6.3.2 The LEAP initiative

Quality enhancement of teaching and learning—a cornerstone of higher education—has usually been pursued at the institutional level through policy development, or at the individual level through particular innovations. A problem with such approaches has been the lack of implementation of quality initiatives at the Divisional or School levels. In order to address this problem, Curtin has committed two million dollars over three years to the Learning Effectiveness Alliance Program (LEAP) to support quality enhancement in Divisions or Schools.

LEAP recognises the importance of a comprehensive approach to quality enhancement with shared responsibility between the three levels— institutional, Divisional/School and individual staff. Ongoing project support is provided by a team from the Office of Teaching and Learning. LEAP is designed to enhance the quality of teaching and learning by committing financial and other resources to several exemplary developments in selected areas of the University. Those selected are seen as being able, through participation in LEAP, to make a major impact on other areas as well as their own. (More detail about this scheme is provided in Appendix D.)

6.3.3 Redressing barriers to research

In 1998 the Research and Development Office, in conjunction with the Office of Teaching and Learning, commissioned a report on *Raising the research performance at Curtin: Redressing the barriers* (Hall 1999). It was instigated as a first step in increasing staff participation in high quality research—this step being the second strategic initiative in the RMP.

The purposes of the report were to:

- identify the perceived nature and extent of the barriers to research performance at Curtin;
- identify good practice being used by other universities in their attempts to improve research performance; and
- develop a set of viable and well-supported recommendations for redressing Curtin's barriers by the year 2001.

Overall, 265 Curtin researchers provided data for the project and from their responses twelve main barriers to research were identified. Several perceived barriers are of special interest within the present study insofar as redressing them would strengthen the nexus between teaching and research. They include:

- a limited understanding of the teaching/research nexus among some staff;
- the lack of centralised on-going support and professional development for research compared with that for teaching;
- insufficient support for different types of scholarly work;
- the need for a reward (e.g. promotions) system that values a range of scholarly activity; and
- part-time, casual and teaching staff who have recently acquired doctorates and who may undertake little research or research supervision.

These barriers are specifically considered in section 6.7 below.

6.3.4 A matrix of performance measures

The Research and Development Office has been working for some time on a 'matrix of measures' to provide a more sophisticated description of the research and development effort of the University. Now it is being explored for its applicability to teaching and learning as well as research and development activities. A common framework has the advantage of highlighting the nexus between the two areas rather than focusing on the differences.

6.3.5 Supporting document on expectations for each level of promotion

In 1999 the Academic Board adopted a framework to give greater clarity to the outcomes expected of promotions candidates at each level. The guidelines assist both individuals and committees to link applications to the University's values and goals for Teaching and Learning and Research and Development.

6.3.6 Professional portfolios for promotions

In 1998, a project was funded through a Strategic Initiatives grant to examine the use of portfolios for promotion purposes and possibly for regular staff reviews. Portfolios provide a flexible means of accumulating evidence of achievement and development using products developed from a number of sources. One crucial aspect of having portfolios has been to decide on their purpose since this determines what needs to be included, and in what forms. If a portfolio is designed mainly to demonstrate quality already achieved, then the products included will be different from those used if the focus is on how one is working to enhance one's scholarly activities.

The recent portfolio documentation does not invoke the four-fold Boyer model as such. Instead, it uses the linking notion of scholarship with reference to both R&D and T&L. Unlike some other universities, Curtin includes research as well as teaching in its portfolio requirement.

Policy

Each member of academic staff shall develop and maintain a Professional Portfolio.

Objectives

- To foster and support reflective teaching and learning practice and continuous improvement in teaching and research.
- To provide structured and comprehensive evidence of an individual's achievements in Teaching and Learning and Research and Development (including consultancy and project management).

Professional Portfolios Policy 1999, p.1.

6.4 The nexus in undergraduate education

Across the different campuses and within each of the Divisions at Curtin, there are many examples of enquiry-based learning. Indeed, professional education programs—for example in health sciences, social work and psychology—have strong traditions including evidence-based practice and problem-based learning where a nexus is evident. Curtin Business School staff have developed and published case studies. Applied Physics and Chemistry use 'studio-based' approaches to teach their laboratory-based science with excellent results. Many teaching and learning initiatives have occurred through externally funded research and have been published in a range of disciplinary journals. (See, for example, the case vignette for Applied Chemistry in Appendix C)

Four-year degree programs contain independent student projects, as do many three-year degrees. Some undergraduates (such as those studying Cultural Heritage) have opportunities to undertake 'real-world' projects that lead to reports where their names are included as co-authors. Although the University keeps no formal records of undergraduate students as co-authors, there are enough examples from the case study interviews to suggest that considerable numbers of graduates are able to include projects and authorship as part of their Curriculum Vitae.

Within Curtin, there are examples of staff who define their primary research work as pedagogical research within their discipline. In the case of some staff (for example within Biomedical Sciences), this focus has emerged because they do not have the opportunity to proceed in their original disciplinary area or specialisation. For other staff, including teachers in Applied Science and some in Business too, pedagogical research is driven solely by a love of

teaching and learning and a desire to do it better. Reflective practice sessions run within the Centre for Educational Advancement (CEA) have been an important means of supporting research into teaching and learning. CEA provides information to staff directing them to journals in which to publish articles on their teaching. And staff have done so successfully.

The challenges of offshore teaching, internationalisation and cross-cultural teaching are also areas for research in several schools. With one of the highest overseas student enrolments among Australian universities, and conducting offshore programs across a range of disciplines, Curtin has many staff who are well placed to contribute to research in these areas.

6.5 The nexus in postgraduate education and supervision

The very large numbers of students in areas like the Science and Mathematics Education centre (SMEC) place huge demands on the teaching staff to sustain high teaching and research supervision loads. The SMEC report (Appendix C) illustrates clearly the advantages of designing a curriculum entirely around staff teaching/research interests. The nexus comes through the strong interrelationships developed not only between teaching and research but also between teacher and students whose professional practice and research interests intersect. The SMEC must surely have one of the highest postgraduate student/staff ratios in the nation. The nexus is critical to the sustaining this enterprise.

Postgraduate certificates, diplomas and course-work degrees are one of the major growth areas for this University. In the case of professional studies, there is also ample evidence of enquiry-based learning and the integration of postgraduate students into the research and scholarly work of academic units.

Postgraduate supervision for students undertaking research degrees is more of a challenge. In part this stems from staff having only recently completed postgraduate qualifications themselves. In some areas the discipline or specialisation is new. The Research Institute in Cultural Heritage faces the difficulties of delineating and supporting appropriate research activities in a new field while e-commerce within the School of Business has had to seek supervisors overseas and on-line to help teach and supervise its PhD students. However, there are also strong research units in each Division with a critical mass of research students and experienced supervisors.

6.6 The nexus and staff development offered through the CEA

For several years Curtin's Centre for Educational Advancement (CEA) has sustained reflective practice sessions for staff from all Schools on the Curtin campus. Significant numbers of staff have availed themselves of the opportunity to join together for two hours each week to reflect upon and talk about their teaching. The impact of these sessions can be seen in the numbers of staff researching their own teaching. It seems highly unlikely that one would find the amount of scholarly investigation of teaching that exists at Curtin in all the Divisions, without the staff developers to support them.

Several staff mentioned during the interviews for the case studies that they had first been encouraged to present their pedagogical research at the combined universities annual Teaching and Learning Forum (TLF), held each February at a Perth campus of one of the five Western Australian universities. Curtin initiated the TLF and Curtin staff have always been the largest group of attenders and presenters at this event. The proceedings are made available in electronic form.

During 1999, the CEA has organised a series of forums to 'showcase' teaching and learning innovations across the University, including branch campuses. Students have had the opportunity to participate with staff and to contribute their perspectives on teaching and learning to an academic audience. These forums have been important occasions for students to give a perspective on the nexus as they have experienced it as learners.

6.7 Impediments to the nexus

Impediments to the nexus within Curtin include:

1. As yet little understanding of the nexus concept among some staff

Hall (1999) found that the staff who attended the focus groups for her research saw little or no connection between teaching and research. They could see that the two were connected when staff researched their own teaching, but many did not want to do this and saw it as an activity that took them away from their real research or as a threat to their research program. They could see a positive connection in supervision of research students and projects although many of them had not considered this before it was drawn to their attention. There appears to be scope to develop conversations within the University community to extend understanding of the nexus.

2. Teaching/research divisions in the situation of some staff

Staff who undertake teaching in one area while surrounded by staff whose discipline is another (exemplified by the case vignette in Appendix C of Dr Jeanne Dawson who teaches communication within the School of Accounting) can find little natural support for their scholarly activities. Unless such staff are able to form relationships across the University, or through professional sources, they remain isolated from other scholars and attend to teaching, rather than teaching and research. They do not have the benefit of postgraduate students working with them on research projects and potential research students are unlikely to know of their existence.

3. An imbalance in on-going support and professional development of researchers compared with teachers

While the University has strong CEA support for staff in the areas of teaching and learning, there is no equivalent centralised support structure in research. Strong research departments mentor junior academic staff. Junior staff whose scholarly specialisms are either very new or different express a sense of isolation as supervisors and when seeking feedback and support for grant applications.

4. Catering for different types of scholarly activity through the reward system

While this has been an impediment in the past, recent changes to the promotions policy, such as the inclusion of professional portfolios together with the detailed spelling out of expectations for each academic level, should greatly assist in showing staff ways in which they can integrate their scholarly work in the two core activities.

5. The numbers of teaching-only staff and staff who have recently acquired doctorates

Part-time and casual teaching staff undertake little research or project supervision. Indeed it is generally not part of their contracts to do so. Staff who have recently completed doctoral qualifications and those who work in new disciplinary areas need time to develop their own research programs and to involve postgraduate and undergraduate students in projects.

6. High teaching loads and large classes

Staff across Divisions mentioned the impact of high (and growing) teaching hours and large classes including numerous students with a first language other than English. With these teaching loads come administrative responsibilities. Many staff work more than 60 hours a week during semester preparing classes, marking assignments and seeing students. Those gathering data related to their pedagogy report being able to continue with this component of research. However, finding time for ethnography, field studies

or laboratory research is severely compromised in the face of 16 and more hours of teaching per week to classes of some hundreds of students. Thus the task of keeping teaching informed by one's own research activity is difficult.

6.8 Summary

Curtin University of Technology is a highly complex organisation offering a wide range of undergraduate and postgraduate courses that reflect the expansion and diversification of higher education over the past twenty years. In the push to develop new courses, internationalise programs, and enrol more students, it is hardly surprising that some staff experience a tension between teaching and research.

In redefining its mission, goals and objectives Curtin has developed a broad conception of scholarship and is intent upon integrating the two core activities. It is recognised that scholarship can find expression in different ways. Lynton's remarks are apposite:

At the heart of this broader conception is the recognition that scholarship is characterised as much by process as it is by outcomes. It is displayed by the manner in which a scholar explores and analyses a complex situation, using his or her expertise to identify both its similarities and its differences from prior, similar problems, chooses an optimal goal and appropriate methods, pursues the project in a reflective manner, and acquires new knowledge and understanding both from the process and the outcome. These 'habits of mind' can be manifested in equal measure when creating a new pedagogic approach to a complex subject, finding new ways of working with an external client with a pressing problem, or carrying out a basic or applied research project. An individual can demonstrate scholarly qualities in many more ways than by means of traditional research published in refereed journals. Traditional as well as other kinds of teaching and also professional outreach and applied work can be carried out in a scholarly manner.

Lynton 1996, p.1

The Offices of Teaching and Learning and Research and Development are both critical players in promoting this conception of scholarship, and their importance as shapers of Curtin's vision of a community of learning can only increase.

7. Comparisons across the three universities: strengthening the nexus

Having described the different contexts of the three universities, we turn now to compare views of how to strengthen the teaching/research nexus that were contributed both by senior executive and academic staff. If, as Brew and Boud (1995b) have suggested, a nexus exists insofar as teaching and research both entail learning, then each university is in its own way strengthening the nexus through its focus on enhancing learning.

Each institution pays careful attention to demonstrating to its constituents and stakeholders that it values quality learning. Each one has:

- developed its own language to reflect a new focus on teaching for effective learning rather than on teaching as instruction;
- reviewed the role of technology in transforming the learning environment;
- identified barriers and limitations of traditional models of education and is moving to incorporate new technologies and approaches as resources permit;
- developed definitions and frameworks to recognise and value different learning paradigms for different disciplines;
- started to realign current structures to better accommodate collaboration and teamwork;
- involved a range of institutional stakeholders in the change process; and
- organised and reviewed its activities related to all these changes in the context of national quality evaluations.

7.1 Interpretations of what strengthening the nexus implies

In this section of the report we identify the conceptions of the nexus given by the different DVCs and staff within each institution.

7.1.1. Responses from the DVCs

The DVCs' responses can be interpreted only against a background of what each institution already accepts as 'given' in teaching/research relationships,

and in the context of each university's current mission, goals, objectives and strategic directions.

For the **University of Ballarat**, teaching and research are related indirectly through a particular view of scholarship. Many academic staff—be they in business, education, nursing or social welfare—view the nexus as a mediated relationship that is achieved through a range of professional teaching and service activities and also where professional practices are the subject of systematic enquiry.

In the current context at Ballarat attempts to strengthen the nexus include:

- ensuring that the philosophical framework of Boyer's four scholarships, wherever possible, is transparent in policies and practices;
- aligning policies, especially those related to new appointments and promotions, with the overall Boyer framework of the four scholarships;
- developing and supporting a broad range of student educational experiences and student services in ways that reflect the scholarships;
- making the Graduate Centre a focal structure within the University to support all scholars and postgraduate students, especially those in Schools which lack a 'critical mass';
- strategically funding Schools to enhance research activity and outputs; and
- subsidising staff and postgraduate students who wish to complete Graduate Certificates in tertiary teaching and learning.

In the current context at **UWA**, attempts to strengthen the nexus include:

- ensuring that undergraduate students directly experience the benefit of being in a research-intensive university;
- assuring and enhancing the quality of postgraduate research supervision;
- facilitating cross-disciplinary teaching and research whilst preserving the benefits of having strong allegiances to departments;
- enabling a greater number of postgraduate research students to participate in formal structured staff development to skill them as teachers;
- reviewing ways in which research-only staff, the fastest growing group of staff in the University, might become a more integral part of Faculties and Departments; and
- pursuing ways to ensure that every UWA undergraduate student has the opportunity to complete a 'Capstone' project—a supervised, independent project—which is not restricted to those students who proceed to Honours.

Within **Curtin University of Technology**, while there is an awareness of Boyer's model of four scholarships there is no programmatic insistence on it.

Research, at Curtin, encompasses diverse scholarly work but academic staff do

not refer to it in Boyer language. In the current context at Curtin attempts to strengthen the nexus include:

- aligning policies, especially those related to new appointments and promotions, with the mission of the University and its emphasis on the 'interlinking' of teaching and research;
- embedding broader understandings of scholarship, especially what Boyer would call scholarships of application and integration, into relevant policy documents;
- mandating the incorporation of professional portfolios into staff promotions, and encouraging their use for on-going staff review;
- redressing the barriers to research, with particular reference to research into teaching;
- assuring and enhancing the quality of postgraduate research supervision;
- strategically funding quality School and Divisional initiatives that involve research into or structured evaluations of teaching and learning; and
- an institutional 'balance scorecard' approach to monitor performance within a framework that encompasses teaching and research in integrative terms.

The outcome of this analysis of DVCs' responses is to show how each university's initiatives are very precisely constituted in terms of its distinctive situation, characteristics and directions. Each DVC firmly believed that resources, recognition and rewards should be allocated to academic activities in accordance with the institutional plan, and each was committed to ensuring that this happened.

7.1.2 Responses from the staff

An analysis of the data collected during interviews with the academic staff on the question of what they would cite as evidence of a teaching/research nexus resulted in several categories of responses. There were not the same clear differences between the universities as appeared in the comments by DVCs, although there were some differences according to level of appointment and length of tenure. However, the small number of interviews precludes us from making more of these data by classifying them or cross tabulating them according to level and appointment within each university. Not surprisingly senior staff (such as Deans, long-standing Heads of Schools and Departments), and especially those staff who also served on key university committees, offered particularly comprehensive responses.

Illustrative remarks are included for each of the five response categories.

1. *Teaching is based on, or otherwise related to, staff research interests*

- 1.1 The (undergraduate and/or postgraduate coursework) curriculum is based strongly around the research interests and strengths of staff.

The Centre's coursework and curriculum directly reflect the research interests and strengths of the staff. (Head of School, Ballarat)

- 1.2 Staff are encouraged to make careful and considered decisions individually and as a group, with their Head, regarding the collective responsibilities and directions for the Department/School. These decisions determine workload allocations.

This Department has been able to accommodate differences while preserving the expectation that all staff will engage in carrying responsibilities in each area. When staff are able to have some choice in what they do, they do it better.

You can't force people to do research and it doesn't make a lot of sense to try to measure it in a quantitative, comparative way. This Department doesn't closely monitor research except through the reports that go to the University. But staff need to understand the effects that this may have upon their career progression and be given chances to renegotiate their position. (Professor and former Head of Department, UWA)

2. *Teaching and research connect with, and arise from, activities undertaken in the community*

- 2.1 Staff are involved in community teaching work that contributes to the research work undertaken in agencies or community settings which brings returns through enrolments and contract funding to the School/Department.

There have been some significant spin-offs for me and the School in providing professional development, consultancy and in attracting postgraduate students into what they see as 'meaningful research classes.' We've gained contracts we would not otherwise have. (Lecturer, Ballarat)

- 2.2 Staff and students collaborate in undertaking applied research for clients, and share their experiences through conferences and published work.

Research in these (service-learning) contexts is the teaching. Students do applied research and the content is also applied research. There is no separation of research and practice as there might be in other

learning contexts. Some of the best projects are published and presented to agency (in-house) and other conferences. (Lecturer, Ballarat)

3. Students are involved as collaborative researchers

- 3.1 Undergraduates are supported and encouraged to undertake research; whether part of a staff member's project, or their own enquiries.

Our contribution to our students, and the community, is through the nexus of teaching with real research projects. (Head of Research Centre, Curtin)

- 3.2 A Department/School operates as a 'community of scholars' that includes staff and undergraduate and postgraduate students.

I assign aspects of my projects to students to solve either on their own or in teams, depending upon their goals and mine too. The students were initially resistant to the idea of sharing because all they could see were the differences in their problems. Now through small group supervision, students see the commonalities within the field. They understand how as scholars we learn from one another. (Professor, Ballarat)

4. Teaching and research converge under the umbrella of 'Research Training'

- 4.1 Quality postgraduate research supervision is provided throughout a Department/School.

Teaching and research 'bump into each other' whenever one is engaged in research supervision. Supervision of students is the most powerful example of the nexus because teaching and research are occurring simultaneously and often reciprocally. (Head of Department, UWA)

- 4.2 Postgraduate research students are mentored to contribute effectively to teaching the program.

Research supervision brings teaching and research together, as does mentoring junior academics. It's just a natural part of the process and we need to encourage this role more. (Professor, UWA)

5. Teaching and research converge through research into teaching and learning itself

- 5.1 Staff are researching their teaching and publishing their findings.

Over some years I've written, trialed, and evaluated a number of case studies for the students in my units. It's been difficult finding places to publish these reported (case studies) although I've recently been successful. (Lecturer, Curtin)

- 5.2 New teaching or consultancy demands (for example teaching offshore or new curriculum strands) immediately lead to staff reviewing them as opportunities for research.

This new opportunity created an education and research 'team' focusing on an aspect of Electronic Commerce from an educational and a research perspective. (Head of Department, Curtin)

The main outcome of this analysis of staff responses is a demonstration that teaching and research can work as warp and weft. Variations in ways of understanding the phenomena are a function of the discipline, the academic staff member's experience, and the 'culture' of the department/school.

7.2 Factors within institutions that foster or encourage a nexus

Everywhere it was accepted that both teaching and research are legitimate activities expected of all academics. It is the relative emphasis put on the two functions that differs within the higher education system, in different parts of universities, and somewhat according to level of appointment.

Every person interviewed could point to examples of institutions, or within their own institutions to departments or sections, that lack significant research or teaching functions. Thus throughout much of the former CAE sector there has been only limited research activity, often because teaching loads and the demands of large numbers of students did not allow time for it, or because they were not traditionally funded to do so. Similarly within the 'research universities' there are instances of freestanding research centres that offer little or nothing in the way of teaching, aside from postgraduate research supervision.

7.2.1 Responses from DVCs

While the policy-makers made various observations about what fosters or encourages a nexus, one respondent posed several rhetorical questions:

Should we look for direct links in the work of the individual academic or indirect ones, including those within departments and centres, and how do we attempt to balance the two? Should we encourage links for all academics, and in all departments and disciplines? Is this realistic?

But although some issues remain unresolved, action is already underway. Across the interviews, some different examples emerged of measures being taken to strengthen the nexus. These included:

1. Achieving a better balance between individual and departmental reward systems

There are attempts to strengthen departmental/school reward systems. UWA, for example, last year introduced an award for the best teaching department based on evidence submitted through a departmental teaching portfolio. A professor in the award-winning Department noted that:

The University's move to value and reward teaching and learning through a Departmental award has been significant and more effective than the national teaching awards that go to individuals. It has engaged us as a group of academics collectively and systematically in thinking about our practices, how effective they are, and what we might do better or more effectively. We had to review our several activities, policies, philosophies and bring them together into a coherent framework. We had to think about how teaching and research 'enabled' one another. The exchange of ideas revealed areas where we knew little about what others in the Department did. It took months to prepare, but we were supported by a Head who is particularly interested in and committed to teaching. (Professor, UWA)

Several staff commented that circulating the departmental submissions has had a profound effect on heads of departments and academic staff who now have evidence of the diversity of teaching and learning approaches throughout the University. Through arranging their own seminars and exchanges, departments are learning from one another, and the University's teaching community is enriched.

2. Strategic policy alignment

Since the most recent revision of its strategic plan, Curtin's senior staff and key committees and working parties have been actively involved in aligning policy and practices to ensure that the two core academic activities are complementary and interlinked.

The University of Ballarat directly employs Boyer's four complementary scholarships. However, one senior academic in Ballarat commented upon the problems faced in attempting to work with the Boyer scholarships.

The Boyer report contains many of the common flaws found in program design and implementation in higher education. The goals are worthy, but the report offers little in terms of how an institution is supposed to achieve these goals. It has taken considerable effort to

arrive where we are in developing documentation to put much of the Boyer framework into practice with staff, in promotions especially, and in the whole area of student life. I know of no other university that has attempted to take the scholarships into student life in the ways we have.

Another noted:

The Boyer report contains an implicit model of how things might work in a context where administrators direct, and staff implement. But this sort of power structure tends to create resentment among staff, and could lead to 'empire building' among administrators, while having little impact on students. We knew we had to avoid this eventuality at all costs.

3. Transparent outcomes for promotions and appointments exercises

The development within Curtin of documentation ('Professional Portfolios and Academic Promotions—Curtin's Expectations') which details requirements for each level of promotion illustrates that University's attempts to give transparency to processes and decisions. Such transparency is an important component part of strengthening the nexus since it potentially shapes the whole process of staff career planning and staff development.

For its part, Ballarat has used the 1999 promotions round as a means of illustrating how those staff who were promoted demonstrated their range of scholarly activities and achievements using the revised guidelines.

4. Extending institutional learning from the outcomes of strategically funded projects

The LEAP project at Curtin (described in Appendix D) has been designed specifically so that successful Schools and Divisions are obliged to share the outcomes across the institution. Likewise, publishing the best departmental portfolios on the University website encourages UWA's strategic departmental quality initiative to shape teaching and learning across the campus.

5. The development of better and, where possible, common metrics for teaching and research

If universities were to put in place more rigorous ways of evaluating teaching, it would allow staff to have their teaching scholarship validated and appropriately rewarded. Such moves would contribute to a nexus insofar as departments and universities might sustain arguments for their scholarly contributions to teaching and learning. The difficulty with this is that measures of teaching effectiveness are notoriously difficult to quantify,

especially given the fact that there are many confounding variables that can impact—for better or for worse—on what and how well students learn.

Ballarat is actively exploring how to employ and extend a framework which, although it does not strictly allow comparable evaluation processes and metrics for research and teaching, nevertheless connects with the disciplinary allegiances of most academics. Following Professor Graham Gibbs's work at Oxford Brookes University, Ballarat is seeking to connect the recognition and reward of excellent teaching with the discourses and priorities of individual disciplines and fields of study. Gibbs (1995) argues that it is quite possible to apply equally rigorous processes to evaluating teaching as has long been the tradition for evaluating and rewarding research.

7.2.2 Responses from staff

During the interviews, every academic staff member mentioned the primacy of his or her teaching responsibilities. In a variety of ways each person affirmed that teaching in all its forms is the primary task of academics and that students and peers would judge them in the long run on how well they do their task. No one believed that the reward system (particularly promotion) yet values quality teaching and learning as much as it should. One Dean put it eloquently in saying, 'The only way to change the reward system is to convince the whole university community that teaching is its real lifeblood, the sine qua non for its existence and patronage by students.'

Many of the suggestions made by the DVCs about how to strengthen the nexus were also made by staff, albeit through their own perspectives. Thus staff also suggested incorporating:

- schemes that reward Departments and Schools, not just individuals;
- promotions practices that reward good teaching as well as research;
- openness and transparency in promotions decisions when the criteria are changed to embrace a wider range of scholarly activity; and
- mentoring within and among Departments and Schools for mutual learning.

From their experiences they added the following observations of strategies that are effective in strengthening the nexus:

- practical assistance with knowing where to publish research into pedagogical approaches and in what forms;
- staff mentoring to enhance postgraduate research supervision; and
- career-focused staff development seminars that assist staff to better manage the complexity and change of academic work.

7.3 Factors outside or beyond the institution that strengthen the nexus

One of the surprising results of this study arose from responses to questions about why staff might choose to focus on the nexus. Those staff who wish to apply for promotion, and in particular within Curtin or Ballarat, confront an expectation that they provide evidence of the integration of their teaching and research (or scholarly work in the case of Ballarat) in quite specific ways. So the desire to seek promotion remains an obvious driving force. But there were other similarly powerful drivers that applied not just to individuals, but to disciplines.

7.3.1 Professionally mandated curriculum and pedagogical changes

Several staff mentioned the positive impact on the nexus of professional demands for an evidence-based approach to practice. The selection and writing of problems in a PBL curriculum challenges both staff and students to make links between teaching and research. The same applies when writing case studies, be they for business, law, engineering or education.

7.3.2 Seeking solutions to professional practice issues and problems

The UCAS project in the Law School at UWA illustrates well how a nexus can be fostered when professional groups work with teachers and students to address a 'real-world' problem—in this case to provide solid preparatory legal work for appellants who would otherwise be legally unrepresented. The research components are in both legal practice and legal pedagogy.

The UCAS will meet important community needs by promoting pro-bono legal representation for those who are financially disadvantaged. A successfully operated scheme will enhance the public image of the legal profession, judiciary and participating law schools. It also provides an opportunity to introduce and measure curriculum innovation for practice-oriented law units.

(Law lecturer, UWA)

7.3.3 Publishers' demands for new kinds of student texts

The English Department at UWA revealed a quite unexpected source for a nexus—namely the demand from publishers for new types of texts.

Compilations of writing into ‘Norton’s’ or other such edited volumes have led to a parallel demand from major publishers for companion commentary volumes for students. The scholar preparing these commentaries has to please different and distinct audiences: peer/scholar reviewers, teachers in a variety of courses and institutions, and student users. The nexus arises from integrating one’s scholarship into approaches that will be useful both to other teachers and their students. It is difficult to write such volumes because they must satisfy different audiences.

There is an inevitable tension between making the canon accessible and ‘dumbing it down’. Achieving an appropriate voice for these audiences makes this some of the most demanding scholarly writing I undertake. But teaching shapes my ideas in important ways because I have to think through how I might use the material myself when I structure courses, what I assume as background, what details I put into the footnotes, and what aspects I want to leave students to explore.

(Professor, UWA)

7.3.4 Interfaces between policy and practice

These examples show that institutional initiatives, whilst important ways to foster a nexus, are not necessarily of prime importance to academic staff. It was clear during the interviews with staff in some professional areas that professional accreditation processes had been the primary reason for moving to enquiry and evidence-based learning and for incorporating independent projects. In other cases, a strong nexus had emerged as a natural consequence of program offerings and development reflecting a demand for staff research expertise. Thus for the staff at Curtin’s SMEC (the world’s largest graduate centre for science and mathematics education), constructing the curriculum around their research and incorporating students into selected domains of research activity has enabled the Centre to increase their enrolment numbers while sustaining high quality programs. Without this nexus between teaching and research, such a small number of full-time staff simply could not teach and supervise the numbers of students that they do.

7.4 Strengthening the nexus within undergraduate education

From the suggestions offered during the interviews—also reflected in the case vignettes—we have identified a number of mechanisms for encouraging

linkages between teaching and research in undergraduate education. These include:

- 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;
- acknowledging the contribution that students make to academics' work through their literature searches, field data, dissertations and work and life experiences; and
- 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.

Developmental linkages are likely to be easiest at postgraduate and final-year undergraduate levels, when students have had time to develop their skills, confidence and independence. For similar reasons, such developments may be easiest with those in, or with recent experience of, employment such as mature age or part time students. But this does not preclude similar work with younger undergraduates.

7.5 Summary

Across the three universities there are some common understandings of the nexus, together with significant institutional differences of expression. Where a nexus is working well it is reflected through:

- support for scholarship that informs learning and teaching practices both inside and outside classrooms, laboratories, and libraries;
- teaching informed by current (leading edge) knowledge of the field.;
- students being engaged appropriately in the process of knowledge creation (whether this is in a pure or applied sense)—that benefits not only the discipline itself, but also users;
- reflection on current learning and teaching practices and the development, use, and assessment of new learning environments, curricular and pedagogical approaches and tools;
- new approaches to better develop students who can analyse, synthesise, explore, create and otherwise engage in the intellectual excitement of the university and life beyond;
- ongoing searches for both common and different factors that promote or alternatively hinder the teaching/research connections by discipline; and

- developing institutional strategies to increase the connections.

The three very different universities are engaging their institutional communities in a dialogue to operationalise Boyer's and others' frameworks into their own contexts. Each senior executive team is well aware that what is needed is an ongoing constructive dialogue in all departments/schools, involving academic staff and administrators. The analyses of the interviews demonstrated the wide variety of ways in which academic staff understand the nexus. Staff variously reflected their university's philosophy as they described their enterprises.

Some responses suggested that to strengthen the teaching/research nexus it may be necessary to pay attention to the social organisation and distribution of knowledge within universities and to create programs that encourage dialogue among students, staff and administrators. The department/school is the major (and for some staff the only) formal forum for communication about teaching and research. To move beyond this constraint requires alternative, complementary opportunities for intellectual exchange and not simply a set of policy directives with linked resources descending from administration.

8. Impediments to a nexus

In this section we identify some impediments to a nexus. We start with issues that arose in discussion in each of the universities before moving to others that apply more specifically or uniquely.

8.1 Persisting problems with reward systems

Limitations in the reward system plague each institution and were frequently raised as impediments to a more effective nexus.

8.1.1 Inadequate evaluation systems

There are no truly effective systems for evaluating academic performance comprehensively. No one is satisfied with counting publications to evaluate research quality. Very few believe that students' evaluations of teaching are, by themselves, adequate for assessing the effectiveness of teaching. It has yet to be shown how effective Ballarat's and Curtin's systems are in evaluating critically what Boyer calls the scholarships of application and integration. But these expanded evaluation systems are recognised as being moves in the right direction.

The second problem is that many staff actively resist evaluation. Partly this derives from the recognition of the fallibility of the current systems. Partly it is linked to concerns about the evaluative data that are used. This is difficult to deal with because if rewards are used to change behaviour, someone loses. If good performance is recognised, then less than good has to be recognised too, and something done to enhance or remedy it.

Finally it has long been recognised that it is not possible to have a single system of evaluation that serves both formative and summative roles.

8.1.2 Undervaluing diversity

If new types of scholarship are recognised, then it is imperative that they are valued. Whilst these three universities have variously applied Boyer's framework, it is not clear that all universities do value the kinds of scholars Boyer defined. One reason is fiscal. Some universities have come to depend upon research dollars to maintain their programs, and to raise their prestige in the competition stakes. Some staff (especially research-only staff) have come

to appreciate the life style that comes from grants—able and productive postgraduate students, equipment for their laboratories, access to travel and conference funds, reduced or no teaching load. If a Boyer style model (or some other non-dichotomous model) is to work, then all staff must agree that it is in the best interests of the university to adopt this model.

It would also appear that not all the general public (including parents of prospective students and employers of graduates) necessarily value revised definitions of scholarship. The market value of a degree may be increased, not so much by an improvement in the education of the undergraduates as by a university's enhanced and visible reputation, and this reputation is usually for research. If this is true, then universities have considerable work to do with stakeholders to encompass broader ideas of scholarship and scholarly achievements. This shift is not impossible. Indeed it may be welcomed. But it will take effective public-relations work.

8.1.3 Limited ability to dispense tangible rewards

Insofar as rewards are related to monetary resources, the reward system is constricted by the availability of funds. Salary increases have been hard to fund within universities in recent years and it appears that fiscal constraints are not about to relax.

A characteristic of behaviourist thinking is that rewards must be differential; that is, they must differentiate between good and poor performance. Egalitarianism is largely brought about by staff union action. Unionisation has brought many genuine benefits for staff, but negotiated across-the-board pay increases will hamper any reward system that is being used to bring about changes in performance.

8.2 Underestimating the need for change

It is human that when people recommend change, they are usually recommending change in *other* people. Administrators want the academic staff to change. Academics want the administrators to change. In the Boyer model, change is required of *everyone*. To address the nexus successfully will require further change. Across both the DVCs and the academic staff, there was a remarkable unanimity of views regarding what was needed to address some of the impediments to the nexus. It was not the case, of course, that every individual mentioned every approach. But there were recurrent and consistent themes.

- **Administrators need to reinforce their university's vision and values in every available context.**

Staff, especially heads of departments, highlighted the importance of consistent messages about the nexus being transmitted through the university community and on a sustained basis.

I admire the way in which the DVC takes and makes opportunities to state the values and directions of the University. What I also observe is that, in papers and committees, the same messages are reinforced. The fact that we have a Teaching/Research Nexus Working Party and that its work involves diverse people within the University means that the teaching/research nexus issues are being talked about. What comes through to me is a clear sense of where we are headed and what my responsibilities are as a Head. (Head of Department, UWA)

We've been fortunate in this University to have had widespread discussions about the Boyer scholarships and what they might mean in the Ballarat context. Even though everyone might not be in total agreement about how to apply them, we know that this encompassing definition of scholarship is our base. (Head of School, Ballarat)

For DVCs the experience is that communicating shifts in policy direction or emphasis takes time and effort. The institutional messages regarding both change and continuity in scholarly work need to be clear.

I want to see greater priority given to the undergraduate teaching role. But at the same time scholarship, postgraduate education and service should continue to be important dimensions consistent with our mission. (DVC, UWA)

If progress is to be achieved in enhancing the quality of undergraduate teaching and learning, staff workload policies will need to be supported by efforts that ensure that teaching is valued as a scholarly activity and effectively evaluated, encouraged and rewarded along with research. (DVC, Curtin)

- **Heads of departments/schools need to be effectively trained and rewarded to lead their academic units.**

Heads identified their role as critical in achieving a better nexus. Their responsibilities for allocating and monitoring workloads, supervision responsibilities and staff appraisal place them in a pivotal position with respect to how the nexus operates both for individual academics and within their departments/schools. Many heads experienced a need for support to better perform this role.

The academic department and the head set and sustain the academic climate for scholarly activities. The department is the unit that has to decide on teaching, supervision and research activities. So the head of department is central to structuring workloads and thereby creates much of the environment for reward structures. You don't just have these capabilities. You need opportunities or good mentors to learn them. (Professor, UWA)

- **Administrators and heads need to grapple with the summative and formative aspects of staff review for both teaching and research.**

During the interviews staff noted the absence of effective tools and processes with which to undertake summative and formative staff appraisal that encompass both teaching and research equally well. However, professional portfolios integrating the two activities were seen as a means of confronting this difficult issue and providing a context for staff to reflect on the nexus.

The professional portfolio system holds real promise as a promotional tool because of the way it focuses on the two core scholarly activities as complementary and interlinked. We still need to explore how it might be used to support staff in on-going staff review. (DVC, Curtin)

- **Institutions need to develop more effective evaluation systems, especially for teaching, which incorporate peer review.**

Many respondents believed that for scholarly teaching to be recognised on a par with research, rigorous peer appraisal was needed. Such peer appraisal, involving a critical review of how teaching relates to research interests and how scholarly approaches to one's field influence pedagogical approaches and learning goals, directly addresses the nexus.

Curtin has identified strategies to improve the quality of student learning through a greater focus on the evaluation and valuing of teaching and learning, the on-going development of staff as teachers, and the acknowledgement of the importance of teaching and learning through both individual and School reward structures. One's academic peers are becoming an increasingly important part of this process. (DVC, Curtin)

I think that institutional reward schemes have to recognise and value the importance of the scholarship of teaching as comparable to other forms of scholarship. It should be possible for a staff member whose primary contribution to scholarship is in the area of teaching to be recognised on par with the staff member whose primary contribution to scholarship is through research. But teaching then can't remain a purely private activity. (VC, Ballarat)

- **Institutions need to reward departmental as well as individual achievement.**

In the course of conducting this project we identified departments/schools where staff had undertaken a comprehensive review of their collective scholarly activities either to apply for an award or as part of an academic unit review. This process, well done, can provide both a context and incentives for staff to reflect upon how and where teaching and research 'enable one another.'

The University's move to value and reward teaching and learning through a Departmental award has been significant and more effective than the national teaching awards that go to individuals. It has engaged us as a group of academics collectively and systematically in thinking about our practices, how effective they are, and what we might do better or more effectively. We had to review our several activities, policies, philosophies and bring them together into a coherent framework. We had to think about how teaching and research 'enabled' one another. (Professor, UWA)

8.3 Tacitly accepting a teaching/research dichotomy

One significant impediment to the nexus remains the common habit of referring to 'teaching loads' and 'research opportunities'. In persisting with such phrases we continue to indicate a different valuing of the two activities. Language matters. To speak of teaching and research as if they were independent, separable activities makes little sense. Asking staff to record their activities or their use of time as one or the other raises significant issues.

Teaching and research 'bump into each other' whenever one is engaged in research supervision. Supervision of students is the most powerful example of the nexus because teaching and research are occurring simultaneously and often reciprocally.

How should staff record their activities as a research supervisor? Is it research? Is it teaching? It highlights the nexus. Supervision is both. Research supervision is a major part of my academic work—both research and teaching. By categorising activities as we do, we create a problem that should not exist. (Professor, UWA)

Across history and place there are been many different definitions of what it meant to be a scholar and scholarly endeavours have been defined in different ways. Brew's (1999) review of how the debate about the relationship between teaching and research has been conducted highlights 'the futility of endeavouring to establish whether there is or is not a relationship' (p. 300).

She suggests that we ask the question about what is likely to be achieved and lost in continuing the dialogue about the two as if they were separate activities. Brew argues that this way of framing the dialogue is sustained only by those who see themselves as apparent winners. If we persist in dichotomous thinking about the major functions of higher education, who loses and at what cost?

A second is how to extend the valuing of different scholarships through the institutions and the higher education sector. Until fairly recently, even the strongest advocates of better teaching seldom questioned the view that the discovery of new knowledge by means of basic research constituted the principal purpose of universities and the hallmark of a real scholar. Research and scholarship were—and unfortunately often continue to be—used as synonyms. Teaching was not a scholarly activity. And the direct dissemination and application of knowledge to the needs of external constituencies was even lower on the totem pole. It remained lumped with committee work and good citizenship as quasi-philanthropic ‘service’.

An expanded understanding of scholarship, such as that suggested by Boyer, provides opportunities for all academic staff to add to the knowledge base of a discipline or profession. Depending upon both assigned and selected roles, staff contributions will differ. Where these differences are either unacknowledged or remain devalued, it weakens the nexus—to the detriment of the whole institution.

The formal separation of funding for teaching and research/research training poses a major impediment to a nexus, as does increasing the structural/organisational separation of teaching and research roles through establishing more research-only centres that have no in-built structural linkages even with senior levels of the undergraduate program.

8.4 Rewarding quantity rather than quality in research

Quantity without quality has become a bankrupt idea. Those academics we interviewed who had worked in the United Kingdom lauded the practice of asking academics to focus on a select number of outputs that reflected their most important scholarly work. Quantity conceals really important work by its sheer volume. The production of marginally useful journals wastes time and valuable resources within and outside universities and has been identified as a major factor contributing to the inflation of academic library costs. As long as research quantity is fiscally rewarded, an imbalance will be likely in the teaching/research nexus.

8.5 The changing nature of academic work practices

In principle, the unity of teaching and research continues to be at the heart of the idea of a university. But as Coaldrake and Stedman (1999, p.23) point out, pressures on funding are making some models of integration increasingly hard to sustain and are driving some institutions towards an organisational separation of research and teaching. Changing economic and social conditions also have contributed to growing demands and expectations that an undergraduate education might include at least some degree of practical orientation. Some university staff perceive that the 'student-as-customer' orientation places staff under increasing pressure, indeed 'attack', regarding the quality of teaching and student support they offer. Academic staff complain about an overload in administrative and teaching duties that force them to neglect research or to confine major research activities to periods of study leave. Dissatisfaction with the quality of education (for example in CEQ ratings), significant dropout rates, and a long duration of studies—especially in the case of postgraduate students, coupled with dwindling resources, have resulted in initiatives to assess and improve the situation.

Higher education in Australia has been radically overhauled in the last decade. Significant changes came first from the movement from the binary to a unified system of higher education and increases in the overall demand for tertiary studies. Until the abolition of the binary system in the late 1980s, Australian universities were both research and teaching institutions, although the extent to which research interacted with teaching was largely unexamined. The conversion of the CAEs to universities resulted in pressure within those institutions to conduct research. Increasingly the Commonwealth government is placing emphasis on harnessing expenditure to contribute more specifically to national productivity goals and on ensuring that public sector educational institutions contribute to improving the knowledge, skill and intellectual base of Australia.

There has been a significant shift too in the student profile in university education. Higher education has rapidly undergone a transition from restricted to mass higher education, the numbers of overseas student studying in Australian universities have grown exponentially, and universities have had to adapt to considerable falls in funding by reducing unit costs. The shift is one that moves tertiary education into a context where there is increased participation among school leavers as well as mature-age and part-time students. A consequence has been the need to examine the work undertaken by academics and, in particular, the nature and quality of their scholarly and leadership roles. These changes have an impact on academic work practices as staff teach larger classes, many with students whose first language is not

English and international students coming from different pedagogical traditions.

For some of the staff we interviewed, this diversity offers new opportunities to research their pedagogy or to undertake comparative educational studies using their students and fellow teachers as subjects. These approaches achieved a nexus for them. For the majority, however, teaching increasingly diverse groups of students places demands upon staff time, less of which is available for research.

Other academic staff perceive a career path within academe to be less certain. In an attempt to keep open alternative career options these staff report that they deliberately and systematically attend to professional and community activities when other colleagues focus more on teaching and research.

I can't say how long I will stay in academe. In maintaining my professional links, and contributing widely to the community, I can keep more options open.

(Lecturer, Ballarat)

I'm developing publications in areas that interest and motivate me. But I know that this work will probably receive no formal recognition in the system. At this stage of my career, it doesn't much matter for promotion. But I have to do work that brings me personal satisfaction.

(Lecturer, Curtin)

I know that these (publications) are not counted or valued in the system the way it is constructed. But for me this is important work, and should I decide to leave academe it will stand me in good stead.

(Lecturer, UVA)

8.6 The challenge to build community, departmental and campus life

In the 1990 Carnegie Foundation report *Campus life*, Boyer proposed six principles that helped define what it means to have a strong campus community. In the first of these he describes the campus as an educationally purposeful community where staff and students share academic goals and work together to strengthen teaching and learning. It is these principles that are reflected in the University of Ballarat's writings on the importance of student and campus life.

There are at least two reasons why this search for community is particularly challenging in the 1990s. The first is in the number of part-time staff and students. Part-time students are frequently older, often carry many other

responsibilities outside university studies, and find it hard to feel a part of campus in the way that younger, fulltime students do. The same is true also for the staff. If the number of part-time staff grows or is maintained at relatively high levels, so do the complaints that they are left out of decision making and staff development opportunities. The danger is that both these groups will decide that they have little to invest in an institution that is not concerned about their welfare and that they will treat education in purely instrumental terms. In this scenario, the integration of scholarly work for these staff and students is a non-issue, and the institution is the poorer.

Currently within the University of Western Australia there are review processes to examine how best to integrate the large and growing number of 'research-only' staff into academic units, their decision making and teaching. The role of 'research centres' is also under review. The University recognises that isolating research from teaching weakens the nexus.

Another impediment to community has to do with technology. As more and more courses become available on line and distance or off-campus education becomes better, cheaper and more attractive, universities have to answer the question: Why would a student be better off studying and attending classes on campus? Answers cannot be categorical; they must depend on the comparative quality of learning experiences available in different modes within particular fields of study. One interviewee expressed the following view:

There is a prevailing challenge in the design of distance-learning and on-line materials which, through their structure, may make students reliant on a package, set questions and closed answers. I doubt that the students who enrol for some units [in this School] this way have nearly as rich an experience as those who attend on-campus classes.

(Professor, Curtin)

8.7 Summary

The challenge is to find the most productive routes to interactions between these two core activities, or among all three activities if one considers community/service dimensions as part of the nexus too. Several heads of departments/schools noted that when staff lose contact with exploration and discovery, the inspiration and excitement of teaching goes as well. Having opportunities to teach upper-level undergraduate students—especially through project work—or to undertake postgraduate supervision maintains the link. By contrast, employing part-time staff to teach or tutor large first year classes weakens the nexus for both staff and students. Several respondents identified

the long-term value to departments, individuals and students of investing in first year students by giving them the best, most skilled teachers who are also active researchers.

The key for me in good undergraduate teaching derives from what you do in the first year. We have 500 EFTSU students in first year Human Biology. You put your best teachers with these first year students. Yes, it's huge expense and energy, but it flows on, even though there are significant numbers who never do more Human Biology because they take it only as a service unit for another degree. During lectures you show them how to evaluate information, introduce the facts in the area, and demonstrate how to enquire further in the discipline.

(Professor, UWA)

Keeping staff research-active is a key challenge for some heads of departments and schools.

In real research projects everyone learns. The students see me learning. As a teacher/supervisor I build their skills systematically through the process, but they also teach me new things. Having research clusters saves us all time on projects. It increases the interest of staff and students and creates an impetus for progress. Students are doing the research and contributing to the reports.

I struggle constantly with the matter of carrying staff with no research interests. I also have an up-hill battle to retain a critical mass. With significant staff movements, it's hard to be selective about areas of concentration. This is a challenge to both our teaching and research. It's not an easy problem to solve. (Professor, Ballarat)

The discussions we have in this School about research provide a refreshing vitality to staff and their thinking. Research seminars are not an optional extra for anyone. You have to make the time to run them, and run them well. The students tell me that the research-active staff make their subject just more alive for them as students. And it comes through in the comments on the unit evaluations. I am confident that what the students are getting is close to state-of-the art.

(Professor, Curtin)

In the process of identifying impediments, respondents made some consistent recommendations about how to strengthen the nexus. Some of these have been indicated in 8.2 above. Others included:

- asking scholars to highlight their most important and influential work in both teaching and research for appointment and promotions;

- incorporating evaluations of scholarship related to both teaching and research in appointments and promotions;
- wherever possible, incorporating teaching-only (part-time) and research-only staff within academic units in the unit's key decision making processes; and
- establishing *formal* organisational connections or linkages between specialised research centres and departments/schools that allow opportunities for senior undergraduates and honours students to have 'affiliations' during their studies. This would assist able undergraduate students to experience intensive research in operation as well as provide an important student and teaching link for staff who may hold predominantly research-only appointments.

9. Conclusions

This investigation has tried to advance the debate on the nexus from the simple question: Is there a nexus? to an enquiry into implications of the widely-held belief that there is and ought to be such a nexus. Past measures, including student ratings of teaching effectiveness and publication counts, have been looking for a nexus in unlikely places and through largely insensitive measures. The present project assumed that, since teaching and research are regarded as the two core activities of academics, it would be worthwhile to determine whether, and if so how, the relationship between them was actually being enhanced in policy and practices.

We started with two key questions:

- To what extent are teaching and research being experienced as complementary or contradictory for individuals and departments within different universities?
- What are the implications of institutional policies for the practice of individual academics and their departments?

The interviews and case studies revealed that staff from different disciplines do often create a nexus in their scholarly work, albeit driven from diverse motivations. Some drivers are internal and relate to the particular university, while some are external, relating to professional and personal interests and concerns. The analyses reveal ways in which it is possible to work to strengthen the nexus between teaching and research, and highlight that it is valid and important for universities to address the nexus through measures consistent with their mission, goals and objectives. Since universities differ, it is appropriate that the means also differ—a view consistent with that on diversity put forward in a recently released paper (Kemmis et al. 1999).

Australian higher education is now more systematically diverse (with more different kinds of universities) and more programmatically diverse (with more various kinds of programs of teaching and research, for example) than ever before. Yet this diversity is under-recognised and under-rewarded. (p. 1)

The Boyer conceptualisation of university work as being constituted by four scholarships (teaching, application, integration, and discovery) may provide a framework of better understanding diversity more systematically and programmatically. The Boyer view offers a way of understanding diversity more substantively—in terms of the scholarly work that universities actually do. On this view strengthening scholarship means intensifying the relationships between the university and the client groups associated with each face of scholarship. (p. 4)

9.1 Some answers to ‘why strengthen the nexus?’

In the review of the literature, we posed the question, ‘Why strengthen the nexus?’ and identified a rationale reflecting diverse interests and concerns. The analyses of the interview data, policies and practices seen against a backdrop of changes in higher education have highlighted other reasons.

- **A strong teaching/research nexus will potentially serve universities better as they move into an uncertain future**

As Western nations move towards information-based economies, they find themselves competing in higher education in global markets. This is placing a premium on the preparation of students for competitive workforces; and universities and their staff are finding it increasingly necessary to orient their work, especially their teaching, to these objectives. Likewise, governments are increasingly interested in and committed to funding research that has direct benefits for the economy. To the extent that universities can successfully combine these two activities, they are likely to be rewarded. These rewards will take various forms including sustained student enrolments, industry support and diverse research funding.

- **A strong nexus enhances the quality of university teaching and research**

The nexus operates in both directions and, as our respondents identified, teaching and research can enable each other. In the present climate the quality of teaching for effective learning is being emphasised more. University teaching and the assessment and reward structures for teaching are among the most important topics in higher education world-wide, and their importance is increasing. Staff in different disciplines from these three very different universities were aware of the value and importance of both reflective practice and research into teaching. Several were applying the same processes to their research and found new research opportunities stimulated through undergraduate as well as postgraduate teaching.

Policy makers and researchers are giving greater attention to university teaching, for related but different reasons—the former in response to increasing public demands for accountability in higher education, and the latter out of concern for improving student learning. There is concern with the general effectiveness of academic staff members’ use of allocated resources. This performance or accountability-driven research contributes to the decision-making process of many institutions. The demands of accountability have generated the type of research that responds to ‘faculty productivity’ issues such as teaching load, classroom contact hours and student/staff ratios. However, this form of research does not produce any real indication of the quality of teaching and learning that occurs in classrooms.

University teachers over the past decade in particular have been asked to do more with less—that is to teach more classes, teach larger classes, and with fewer instructional support resources. A majority of university teachers currently in the profession have never had formal training on how students learn or how to develop effective learning and teaching strategies. Now academics are being forced to be accountable for their teaching, and if the institution has hired poor teachers, then the institution has a duty to help them develop the necessary skills and abilities to improve. New themes of research into teaching and learning, which incorporate students' cognitive development, staff-student communication, student assessment, internationalising education and a wide range of other aspects of classroom interaction are steps in the right direction. Within each of these dimensions there are complex differences of discipline and history. And staff themselves are pursuing these topics within their own disciplines.

- **A strong nexus through scholarships of application and integration allows universities to relate more closely to new and important clienteles**

Burton Clark's (1998) book *Creating entrepreneurial universities* draws heavily on continental models that look remarkably unlike the classical European universities of the past. The dialogues are more about universities relating to industry, regions, and new clienteles. Public institutions are being increasingly privatised in the sense that they are being asked to take more and more responsibility for raising their own funds. They are also being asked to relate more directly to the community. In each of the universities in this study we found examples of centres, departments and schools solving complex problems within their professions, disciplines and regions through the creation of partnerships where all parties—students, staff, profession, industry—benefit from the outcomes of the collaboration. The collaborations, in turn, created new educational opportunities, and sometimes new sources of funding. Entrepreneurial staff are using their skills, networks and resources to serve professional, local, and regional interests in ways that strengthen their personal scholarly work and that of the university.

A strong nexus brings different benefits to different universities. As Kemmis et al. (1999 p.33) discuss in some depth, the effect of current funding models and the 'zero-sum' approach is to widen the gap between the most and least successful universities. In the longer term this only serves to weaken the system as a whole. Needed instead are policies and national strategic initiatives that value and encourage diversity. The lesson of international experience is the significance of institutional diversity for the health of academic communities, for knowledge development, and the preservation of local and regional identity.

Can we assume that universities that research well will also teach well? Can we assume that universities without a strong past research tradition will offer poorer instruction? The answer to both questions is 'no'. What we can assume is that research-intensive universities are likely to attract and retain good scholars, to have competitive student entry standards, and to attract significant non-government money. How then do institutions less 'successful' on these terms define a role for themselves that focuses them on goals that are achievable?

This study shows that at least one research-intensive university, one university of technology and one of the newest Australian universities are all doing so through defining scholarly work in ways that encompass their respective internal diversity. Each is building relationships to enhance opportunities for teaching and research with the communities with whom they intend to interact.

- **A strong nexus enhances the quality of research by allowing the cross fertilisation of ideas and learning between academics, students, industry, professional associations and other stakeholders**

Applied research with its underpinning professional and industrial links impacts upon the interplay between teaching and research. Several universities, among them the three universities in this study, have formalised approaches to strengthen the links between teaching and research in this way. There are multiple examples of programs involving honours and some undergraduate students working on projects in, and directly supported by, industry. The significant impact of the research, positive feedback from clients and participants, results of external reviews, and the personal contact with industry bodies and associations suggest that, notwithstanding the considerable administrative and supervision costs, collaborative research of this type is well received both within and outside universities with significant benefits for all parties.

- **A strong nexus delivers potential benefits to students and staff**

Students need to be taught to think, formulate problems, and clearly assess and organise knowledge in the context of what some have termed 'new literacies'. This is labour-intensive nurturing work when done well. Is it feasible to reform teaching and learning to deliver the educational outcomes that are needed under the current powerful funding models? Time pressures and sheer lack of time continue to be personal sources of stress for academic staff, as they attempt to provide quality programs and appropriate supports for increasingly diverse groups of students. Many staff report that stress results also from adopting more progressive and student-centred teaching methods. Those staff who are able to integrate research into their teaching report higher levels of satisfaction and some maintain extraordinary productivity.

Public scrutiny has focused on the relevance of studies to the wider community and the extent to which they equip students with necessary skills for the job market. There is a growing belief that education and work activities should feed each other. This is already happening within the secondary sector and will be increasingly demanded of the tertiary sector. Currently the links and transition points from initial education to the work force are weakly articulated except in the case of professional programs with integrated placements and associated requirements. This study brought to light multiple examples of ways staff in different disciplines were creating such opportunities for undergraduate students. It is clear that universities and their staff were giving attention to this dimension of the nexus and supporting it with seminar and other reflective learning activities. In the case of postgraduate students who return to study after work or who combine work and part-time study, it is increasingly common to investigate some area of work or professional practice within the course.

Universities need committed academics to do the teaching. Academics are increasingly asked to do more with less, and student-staff ratios, academic salaries and morale have all deteriorated. Staff are being asked to adjust to new circumstances but are being given few resources to assist in the transition. We discovered centres, departments and schools giving sustained, close attention to relating the teaching curriculum to the range of research in order to find the best fit. In some cases, such as the SMEC at Curtin, it had proven possible to achieve a close to 'perfect match'. However, we also note that there is potential for future difficulties in this context when the most senior staff of the Centre either retire or leave the University.

Research through international collaboration and exchanges is well established in some departments and schools within UWA and Curtin, and is increasing throughout all three universities. These collaborations are often organised to enhance a nexus for the academic units as they incorporate new themes or strands within existing courses, and establish new lines of research. Invitations to overseas scholars are usually arranged in the expectation that, as a result of the contact, both teaching and research will be simultaneously stimulated.

9.2 Features of an (achievable) ideal environment

We have identified ways in which three universities are working to strengthen the teaching/research nexus. In each context particular features were identified as working effectively. It therefore seemed useful to identify what one might see ideally, where policy effectively reinforces a nexus. On the

basis of responses from these three universities, we suggest that many or most of the following would be evident:

- Promotion and appointment processes are designed to reward good teaching in ways comparable to the reward of good research. Teaching, research activity and service are consistent with faculty workload guidelines and school/departmental and university missions.
- While not all staff have the same level of teaching responsibility, all staff strive for high-quality teaching and research and demonstrate a visible commitment to student learning.
- Departments that actively emphasise, encourage, and reward effective teaching as well as research—both founded upon active scholarship in the discipline—are acknowledged and supported at institutional level for such efforts.
- There are many examples within the institution of departmental commitment to enhancing the quality of undergraduate teaching through enquiry. These achievements are well publicised within the educational community. As well, the achievements are shared with all stakeholders as models for ‘best practice.’
- Rewards and recognition for good teaching and research take a variety of forms and include monetary rewards, resources for teaching and distinguished titles. The rewards go beyond one-time acknowledgement of excellence. ‘Master’ teachers, like distinguished researchers, provide a valuable resource to the university in addressing the educational needs of the university, and become an integral part of the university’s strategic planning efforts to shape learning.
- Institutions and faculties, when establishing research-only centres, include a formal organisational link with teaching programs to signal that these centres do not operate independently of the teaching role of universities.
- Systems designed to evaluate teaching and research are sufficiently sophisticated and multidimensional to provide for a thorough assessment of each member’s teaching and research ability, both for the purposes of evaluation and reward and to provide further direction for individual faculty development. Rigorous and effective evaluation of teaching is essential to encouraging students’ learning, life-long staff development, and the development of rewards and incentives. Teaching, like research, is a complex and multi-faceted activity so multidimensional approaches to evaluations, including portfolio approaches, self-evaluation, student evaluation, peer evaluation and other assessments, are all used.

The evaluation serves as a tool for staff growth, development and change as well as for assessment, including promotion. Efforts are in place at an

institutional level to work with the departmental heads to encourage and promote change.

- Institutions provide instructional resources to assist staff in developing creative and innovative instructional approaches to undergraduate education. Regardless of the structure, each department and institution actively supports staff development in teaching and research for academic staff at all levels of experience.

Each department within the university has a well-articulated plan for staff development in teaching and research at all levels, from newly appointed and part-time staff through to full professors. Elements of the plan might include mentoring workshops and seminars on various topics, technology support, and opportunities for staff feedback and assessment. Institutional resources are linked to the implementation of each department's plan. Students have input into the development of these plans.

- Academic programs are structured to provide opportunities for postgraduate students to become skilled teachers as well as researchers. This preparation might take various forms and should be both general preparation for teaching and development specific to the student's discipline. Supervising staff play a critical role in developing postgraduates for their future roles whether as academics or in other capacities. As possible teachers of the future, postgraduate students are actively engaged in the process of preparing to teach. This preparation includes the development of a teaching portfolio including background material such as faculty and peer assessment of teaching performance, students' evaluations, course materials developed through the program, videotapes etc.
- Improving undergraduate and postgraduate instruction and research supervision, ensuring that good student learning is a priority for all staff, is among the highest visible priorities of each department/institution.
- Department heads have in place well defined processes for curriculum development and review, and for staff development that accompanies this step.

Staff development is individually and collectively negotiated with departmental heads to ensure that they can act strategically in this regard and support the institutional goals. Negotiations with new and current staff regarding both work assignments and release time for professional development (for both teaching and research) include considerations of the staff member's performance with regard to both kinds of scholarly activity. Decisions about the use of staff time are consistent with the departmental mission, the potential contribution to departmental needs and individual goals.

Opportunities for new and part-time staff to interact with more experienced staff members in both teaching and research are structured at departmental level.

- The importance of teaching and research is integral to each staff appointment process. The process includes:
 - an opportunity for candidates to discuss their teaching philosophy;
 - an opportunity to teach a class by invitation or to lead a seminar; and
 - a review of the candidate's professional portfolio and his/her objectives for future development.

A great deal of creativity and innovation already exists among academic staff with regard to strategies to enhance student learning through active enquiry. Furthermore, examples of good practice in student learning and teaching effectiveness can be found in each institution. Long-term efforts to shift the culture with regard to teaching and research involve building on the current strengths of the institutions while engaging academic leaders in the creative design of strategies for change. This needs to be a task for academic boards, faculty forums and focus-group discussions including academic leaders, staff and students.

9.3 Recommendations for university management

We sought in this study to focus, in part, on key policy and management issues with particular reference to a range of departments and institutional circumstances: how to create favourable conditions for enhancing the interaction and integration of high-quality teaching and research activities.

From our findings come the following recommendations for university management.

1. Foster wide-ranging debate across the university about concepts of 'scholarship' (e.g. the Boyer model) in relation to changing forms and conditions of teaching and research, seen within the framework of a specific institutional mission.
2. Review the alignment of policies, especially those regarding appointments and promotions, with the concepts of scholarship that are considered appropriate to the particular university's mission and its system for distributing resources, recognition and reward.
3. Adopt schemes for giving material support to Faculty/School/Department initiatives that involve evidence-based research into the area's own learning environment and teaching practices.

4. Consider how 'research-only' centres and staff might be better integrated into the total academic program of Faculties/Schools/Departments, including arrangements for senior students to be affiliated with such a centre or have some exposure to its activities.
5. Maximise opportunities for postgraduate research students to acquire teaching skills through structured professional development programs.
6. Explore ways of providing senior undergraduates in all disciplinary fields with experience in supervised project work that engages their learning with independent knowledge-creating enquiry, organised in direct relation to the research expertise of staff.
7. Develop a common set of measures for teaching performance and research performance.
8. Ensure that any 'teaching costs' component of internal budgetary allocations is sufficiently nuanced to incorporate due recognition of the need for university teachers to maintain an active involvement with current scholarship.

9.4 In conclusion

The current political goals in higher education are clear and defensible: to create effective educational systems for a diverse group of students at a lower cost, to increase the relevance of studies for the job market through efficient training, and to enhance research that is addressing society's problems. The underlying assumption is that market forces will help universities solve their most pressing problems. We observe that universities need the opportunity to specialise, focusing on what they do best and offering it efficiently and effectively to the market.

Universities are facing an uncertain future, one that seems intent to constrain higher education. Do we continue to foster an antagonism between research and teaching, or do we support both with a core ideal that all academics should be teacher/scholars? The evidence provided in the present study is that teacher/scholars represent an achievable ideal.

Expansion of higher education within Australia is bringing with it increased differentiation and the emergence of quite distinct types of universities. The universities in this study are but three examples. New kinds of academic institutions such as the University of Ballarat are developing their ethos in terms of regional relationships, while more established universities such as UWA and Curtin continue to explore ways in which to serve larger and increasingly diverse constituencies. To make sense of this differentiation, each institution must organise its internal academic systems and policies to cater for

its different student clienteles; its partners in industry, the professions and business; and the staff who work within the university. It is no surprise, therefore, to see varieties of scholarship and scholarly activity within them. The emerging new knowledge industry will need to include diverse institutions. Differences in disciplines and fields, especially emerging fields and their knowledge bases, will pose additional challenges for a teaching/research nexus. Most important, student learning is likely to be measured by social demands and employment opportunities and will change the roles of academic staff as service providers. Planners in this context will need to shape a more diverse landscape for higher education, assisted by national higher education policy and funding mechanisms that value and foster diversity.

Appendix A

Case vignettes: University of Ballarat

School of Behavioural Science

Contact details: Associate Professor Rosemary Green, Head of School
Dr John McDonald, Lecturer in Sociology

Within the School of Behavioural Science the staff involved in professional practice effectively integrate and manage at least three different components. They provide community agencies with students to assist with projects; they give students enriched learning as they undertake 'real world' experiences within the agencies; and they secure opportunities for research, consultancy and on-going professional development for their staff. The nexus involves teaching, research and community service—all core academic activities.

Context

The School of Behavioural Science is diverse. Once separate areas—psychology, sociology/anthropology, Koori studies, humanities, and welfare studies—have merged to form this single School. Psychology has contributed particular research strengths both to the School (through running colloquia and through a high number of publications) and to the institution, with the Head of Psychology providing research leadership to the University Research and Higher Degrees Committee.

The School offers a range of undergraduate degrees—some general (such as the BA) and others professional (such as the BPsych and BA Rural Social Welfare). Students are also able to enrol for joint degrees such as a BA/BBus. Postgraduate offerings and enrolments are growing each year. There are Masters, PhD and professional doctorate programs in Psychology with parallel programs being developed in Social Sciences. The School is developing professional postgraduate qualifications suited to people working in the region who are seeking staff development, e.g. through the Graduate Diploma of Rural Social Welfare, Graduate Diploma of Advanced Counselling, and professional doctoral programs.

Teaching/research nexus in undergraduate studies: research to teaching

The School sees itself as having strong links with regional welfare and health agencies. They are developing ‘memoranda of understanding’ with some key agencies to assist both parties with research. Students are placed in local or regional agencies for welfare placements for a total of approximately 1600 days per year. Other students, such as those in the Rural Australia unit, negotiate with community groups to investigate matters of community concern and provide them with reports. Consequently agencies undertake important projects and engage students as project assistants. One clear benefit flows to the School in the form of consultancies and agency evaluations that derive from small-scale student projects.

Agency-related research is used directly in the teaching program to address issues of service delivery and management and to provide students with examples of successful and unsuccessful policy in practice, evaluation and ethical issues. However, working in a regional context imposes some major constraints arising from issues of confidentiality. It can be easy to identify specific regional agencies such as an unnamed secure women’s refuge, a prison, HIV/Aids treatment centres, even though staff provide ‘disguised descriptions’. Staff engage students in role-plays to develop their sensitivity to issues, especially issues of confidentiality, and skills to manage them. This approach makes learning ‘live’. Meantime students learn to appreciate the realities and ethics of undertaking ‘practical research’.

Within Social Sciences and Rural Social Welfare, the key Boyer scholarships are those of Integration and Application. For Rosemary Green, however,

there are not really four scholarships—rather three and a half. They don’t sit neatly in boxes, but work more like overlapping tiles. They come together all the time. When we are teaching students about how to research their practice, what would you expect? There’s always Discovery, Integration and Application to different extents. And we have to reflect all the time on our scholarship of teaching for learning.

I like the (Boyer) four scholarships approach especially because of the Integration and Application domains. This focus has really helped our Social Sciences staff. It sits well in professional education—the sort of education we are engaged in. I’ve noted, though, that it can be hard for our colleagues in Humanities to find examples of the Scholarship of Application when staff are asked to demonstrate their performance in the areas of achievement needed to make a case for promotion.

The promotion policy deliberately precludes us using the same examples to demonstrate achievements in different scholarly areas.

The requirements specifically exclude 'double dipping'. The examples have to be distinct. This is a real challenge when we use such an integrated approach in social science and welfare education, research and practice. We have to work hard to present a strong case to show the different facets of the four scholarships. When I went for promotion this was one of the most personally challenging things for me. I did use the same example for a couple of areas of scholarship, but I had to clearly highlight complementary aspects within my approach.

We've had good outcomes in staff promotion from this School based on the four scholarships model. The University shows respect for teaching within promotion, and valuing teaching publicly within the University is important. Staff are using the four scholarships more effectively to demonstrate their expertise in different aspects of scholarship, not just the traditional emphasis on research and publications.

Teaching/research nexus in undergraduate studies: teaching to research

Teaching, for Rosemary Green, is a way of keeping theory current, and it then contributes to planning and conducting research. She noted that:

our colleagues in the field have often forgotten aspects of the theory. They often have very loose conceptual frameworks, and the University can help them in developing a stronger theoretical or conceptual base, while the agency staff are often more aware of policy and practical implications of proposed action.' She noted the value to agencies of university staff being 'up with theory' when it comes to knowing the literature and current research designs and approaches. 'It has helped us secure funding for joint submissions because the approaches are better integrated—theory, practice and research are strongly linked.

Why the nexus is important

We would lose enormous credibility professionally if we were only teaching and not doing research. I believe the quality of our teaching would suffer. Research gives it currency and application while generating enthusiasm for students and for us. Research has to be a part of professional education. If we were designated a 'teaching only institution' it would just increase pressure on staff to find ways of securing money to pursue research with agencies through

consultancies and tenders, and this would negatively impact on the more theoretical and conceptual research completed in the School. Research opportunities have a major influence on teaching and practice for our students and the experiences they gain in real-world contexts.

A challenge: potential tension between the School and institutional objectives

In a small institution intent on building a research culture, strong research Schools offer potential leaders and mentors for staff. However, there are clear benefits for the School in focusing on its own agenda rather than in institutional one. The returns come in professional kudos, outcomes for postgraduate students and a strong School esprit de corps. The newly established Graduate Centre needs to draw upon skilled research staff and graduate students across discipline areas within the University who can make a contribution to seminars and supervision. Without the support of a wider group of academics/supervisors, seminar and postgraduate educational activity may not be viable or will rest too heavily on a very few individuals. Creating incentives for research-strong schools to contribute both to the institution and to their own disciplinary activities when time and effort are at a premium is a challenge within the University.

Dr John McDonald worked in Disability Services within Victoria's Grampian Region for several years before he joined the UB staff as a lecturer in sociology in 1995. His human services experience in the public sector provided a diverse background in policy, planning and primary care. As he moved into higher education he brought not just this experience but a well-established network of community contacts. He regards both his research and teaching as being mutually informed through these contacts which also complement UB's focus on valuing staff connections within the Region.

The nexus in undergraduate studies: research, teaching and community service entwined

John McDonald coordinates a third year undergraduate unit on research methods. He supervises all 50 or so students who undertake a compulsory research project within the 'local' community. Over the past five years around 300 students have undertaken highly diverse community-based projects. Findings from a few of the very best projects have been published in the *Journal of the Australian and New Zealand Student Services Association*.

Such an enterprise rests upon maintaining an effective professional network, responsive problem-solving and negotiation when difficulties arise—as inevitably they do. However John is convinced of the benefits to all parties in the arrangements. For a few students, the project has led to a direct offer of employment. One student, who undertook a project for a major bank, now works as one of their mortgage brokers. For most students, links to employment are less direct, but they gain contacts, networks, skills and a sense of competence. For some the project provides motivation to proceed with Honours or postgraduate studies as they gain experience with research and a conceptual understanding of its purposes and outcomes. ‘Research gets de-mystified’.

The benefits to organisations include the insights of an outsider, the outcomes of the specific project—including a written report and recommendations—and the services of an extra person with access to good ‘know-how’. Several students are currently undertaking needs-analyses for organisations. These needs-analyses then form the bases for framing later submissions to fund projects. Without this first step it is unlikely that agencies would have the information they need to support funding applications.

It is direct and purposeful for all concerned. The students learn how to write good reports and how reports are used to justify funding submissions. They have to learn to write for specific and different audiences. This means that while at university they gain experience not just in producing essays and completing examinations but in writing that shapes services and affects people. The expression ‘It’s all academic’ is an interesting one. It means that the work doesn’t really matter. But this sort of project activity does matter and everyone gets mileage from it.

The nexus in postgraduate work

Parallels are there too for graduate students in rural health and the evaluation studies as they research aspects of their own work contexts. These studies include school retention among ‘at-risk’ youth, rural palliative care and home care provision. The students—also employees—develop thesis topics relevant to issues in their particular service context. Naturally, there are tensions to manage here too. These include role confusion (how to stay detached from work and simultaneously study it); line accountability confusion (what is told to supervisors about emerging results and the implications); and the ethics of how and where the information is used. But, as John McDonald notes, ‘It adds both complexity and reality to the educational process.’

The inseparability of teaching and research

Research approaches and ethical issues that arise in these contexts become the focus of teaching. The unit content reflects their own applied research. There is no separation of research and practice as there might be in other learning contexts where a Research Methods unit has no such project component involving gathering and evaluating one's own data. The experience provides quality assurance for the projects undertaken and agencies request that students be placed with them for a project component.

Effects on the lecturer's approaches to teaching and research

The effect on John McDonald's own research has been that, as a result of working with agencies and reflecting on their questions, he has become progressively involved in reshaping his own research directions and contributions. Now he assists agencies as they move from crisis management to early intervention and prevention. Confident in the ability of his own students, he employs them as research assistants to contribute to literature searches, data analysis and interpretation. Collaboration with agencies in his own research has some direct effects on his teaching. Using practical examples, he critiques Government policy in action, and draws on students' insights and examples. Like Rosemary Green he is selective and discriminating in using his own examples where this use could violate ethics and confidentiality.

The influence of teaching upon research

In many areas of service delivery and social policy, research methodology is increasingly driven by pragmatics rather than a methodological ideology. I sit with students and we talk about research approaches and assumptions that underlie them. We debate these extensively which has really helped me to clarify my views. I came from a strong positivist view of research—the legacy of a rigorous psychology training—and I have had to rethink the purposes of the research; the outcomes and what they might mean; who the research is really for and why we are doing this evaluation or needs-analysis. So I find I often steer towards a combination of methods and am able to justify why they will work best in combination. Teaching has helped me become more confident in this approach. Teaching students to think through the process of selecting methodologies has really changed my perspective. I now have some clear notions of how to do research in the real world. It has also made me more credible with my peers.

There have been some significant spin-offs in providing professional development, consultancy and in attracting postgraduate students into what they evaluate as 'meaningful research classes.'

The nexus as reflected through Boyer's four scholarships

John McDonald believes that the Boyer framework provides coherence for staff, the School and the institution. 'It is both integrative and productive. The framework is especially powerful when thinking about promotion.' It has shifted the criteria for staff to focus on and given them a blueprint to follow. The nexus as expressed through the framework of scholarships is important because it 'describes what we do. It makes sense of the ways in which we carry out our work with students in our fields.'

Ways to strengthen the nexus

John McDonald's suggestions for strengthening the nexus included more of an institutional focus to linking and make explicit the four scholarships in unit descriptions, course proposals and within the annual report. The Boyer distinction is

useful but is has yet really to permeate into many areas of our work. What we need across the School is a balance of scholarships, integrating them into the variety of work we do. Some people are adept at marrying the scholarships with their work, but this is rare. It would help us to engage our focus on identifying a variety of ways this might be done.

The role of staff development in institutional learning

'Centres such as SEDS (Scholarship and Education Development Services) play an important part in helping people to translate Boyer's Scholarships to their own areas on enquiry.' For John McDonald, the process of completing the Graduate Certificate in Education, reflecting on practice and seeing how the scholarships could relate to his work gave him important insights into University policy/practice relationships. He observed that 'Since only very few staff enrol formally in this course, this means of institutional translation is slow, but it is effective.'

School of Business

Contact details: Professor Julian Lowe, Head of School

Schools of Business pose some inherent challenges to the research-teaching nexus. At both undergraduate and masters levels there are increasing numbers of units designed specifically to prepare graduates for work in the business sector. Professional staff who teach in Schools of Business, especially

accounting or law subjects while undertaking scholarly work, are usually not undertaking traditional research and may have few academic aspirations. This case illustrates these dilemmas.

Julian Lowe's academic qualifications are in Economics. However, he now lays no claim to specific expertise in that field: 'I can't keep up with the maths'. He has turned instead to developing an interest in strategic management. Julian Lowe observed that until recently Business Schools offered numbers of idiosyncratic units reflecting the diverse interests of staff rather than the needs of students. 'Now students are offered a broad education for business but many of the unique, more interesting units have gone.'

As more and more students enter Business courses, classes have grown to sizes of 400 or more. Many units are now designed around a standard package which includes a substantial text, a study manual, and web connections or CD-ROM. Staff work through the text and set case examples with students, often in areas in which they as teachers may have little interest or specific expertise. In other words, students may receive a largely standardised curriculum which is delivered in fairly standardised ways nationally and internationally. This educational approach means there is far less opportunity to bring in one's own research experience and interests. And in undergraduate units, Julian Lowe observes, it hardly happens at all.

Consequently he believes that the nexus probably only operates in Business within graduate studies and in two distinctive ways. Most teachers of graduate students can incorporate their own research interests and endeavours for possibly 'not more than 10 per cent of the course, but there is a general research frame that influences their approach to teaching. From the broad spectrum of knowledge, they critique issues within the discipline and help students learn how to evaluate research. This has a two-fold benefit for students: they come to appreciate the validity and generalisability of findings from studies, and they learn to evaluate the possible impact of social science research'.

School research profile

Within the School of Business there is wide variability in research activity. Most staff teaching in Organisational Behaviour undertake research. In other areas the staff are divided 50/50 into teaching-only and research-active staff, while the lawyers ('very switched on people who are great teachers and exceptional critical thinkers who continue their practice') do 'no research, as universities generally understand it. Their scholarship is in revisiting and interpreting deliberations and judgements'.

The effect of these differences upon Business School staff pursuing promotion has varied. 'University staff really need to be research active. Some with strong industry/ teaching links have not been successful in making their case for promotion.' Consequently there is a tension within the Business School. The differential earning capacity of lawyers and accountants in practice means there is little incentive for these professionals to stay in academe—especially if they can't get promotion. He notes from monitoring business research journals that it is difficult for Australian academics to publish internationally in the business area and doubts that this situation is very different even in the most prestigious Australian universities. Partly this results because international business research does not focus on problems in the Australian sector. Australian companies are small and not especially interesting on the world stage. He could identify only one or two articles in key international journals during the last ten years that had focused on Australian business.

Promoting a research culture

Within Ballarat's Business School, pressures lie in teaching and servicing the large undergraduate student groups. Although there are potential clusters of researchers, the Ballarat Business School has the challenges of the small university needing to cover diverse areas. Among the group of staff who research corporate governance, there is either very little exchange or 'the dialogue of the deaf' because they hold differing views. Other staff have formed broad groupings to focus on such as gender and management, stress management, agribusiness marketing, and the groups allow for some level of conversation and exchange, but 'there is little serious prompting to new heights'.

Julian Lowe's approach has been to specifically devote research funds to hiring a former PVC (Research) as a 'mentor' within his School. This person is able to empathise with staff, facilitate their research, has 'no axe to grind, while having both experience and wisdom to contribute to research development'. For Lowe, 'the building of research culture has to come from within. It must be curiosity driven and intrinsic. Staff with an orientation to research wake in the morning still with yesterday's research problems and then think about them more as they go to bed'. His litmus test is to ask staff 'what have you been working on today?' Those with a 'research attitude' talk about their research, while those oriented to teaching and administration highlight those areas.

Boyer's four scholarships

Boyer provides 'a useful conceptual framework for the University and allows staff to see how they might contribute in different ways. But without an internal drive to do research, the framework cannot be put to good effect.'

Strengthening the nexus

Julian Lowe's recent experiences with the UK funding model led him to reflect on how frenetic staff can become about research when it directly impacts on university funding to give differential rewards to those at the top and the bottom. ('Three times the funding goes to the top universities compared with those at the bottom', he observed.) He is concerned that as the national statistical database grows, similar differentials could appear in higher education in Australia.

Teaching, unlike research, is not so unambiguously measurable. Consequently, we really only pay attention to performance in the top and bottom 10 per cent, and what happens in the middle doesn't really count. We have to pay attention to how we get material across to students.

Student projects are not offered 'perhaps as much as they should be in Business'. It's not been part of the philosophy within the School, but students do have the option. Although there is a research stream offered within the graduate program, only 5 per cent of students elect it. 'They just don't see the point!'

The strongest incentive to strengthen the nexus comes, he believes, from creating and sustaining clusters.

Geography does matter and it matters more and more! People continue to gather in Silicon Valley because there are huge benefits from the contact and the conversations. In face-to-face conversations you learn differently from each other. Our challenge at Ballarat is how to do this!

Centre for Environmental Management

Contact details: Associate Professor Martin Westbrooke, Head, School of Science

This Centre illustrates how learning can be enhanced by integrating teaching and research throughout the undergraduate and graduate programs, in ways that reflect situational and disciplinary characteristics. It also shows how this integration can serve important institutional strategic goals.

The nexus as reflected in research approaches in undergraduate teaching

The basic underlying philosophy of this Centre is to skill students at all levels of study to become active, engaged participants in real-world, local environmental projects. During their first year of study students undertake a core first-year unit that includes a compulsory seminar program. This weekly program includes presentations from both Honours students and 'outsiders' who speak about their approach to environmental problems and issues. Although first year students have as yet little specific disciplinary background, they nonetheless are expected to participate as future scientists who can learn from the models colleagues provide. Presenters are asked to highlight key research questions and the reasons underlying their approach. First year students cannot treat the seminar program lightly as the final examination contains questions related to it!

The seminar program is thus well established as part of the undergraduate and departmental culture. Over the three-year basic degree students have the opportunity to participate in about 100 such seminars. In their third year all students complete a major independent research project which counts for 25 per cent of their total assessment. A unit in Research Methods provides the framework for them to complete a proposal. While doing the project they link directly with the industries and people who provided ideas for the projects, who also assist with supervision. The School encourages publication of the projects. Some are formally published, appearing as short papers or reports. Joint supervision between field staff and university staff can be a complicated process as the goals of the field staff are not necessarily always congruent with those approved by the University in the proposal.

As was noted in body of this report, the University of Ballarat is a relative latecomer to university status. Yet, within this School, 25 per cent of undergraduates now enter the Honours program. This enrolment happens despite the excellent work prospects of graduates with a three-year degree. Many Honours students receive small industry grants of up to \$3000 to complete their projects. Because the student projects may not have outcomes of direct benefits to industry, industry sees this funding more as a donation to the School than an investment in research. Nonetheless, findings of use to industry do emerge from Honours projects and can net all the partners—students, staff, and industry—some valuable returns.

Martin Westbrooke is in no doubt that the School's strong industry and consultancy links on major research projects with tight requirements and outcomes are responsible for these additional small student grants, which operate in some sense as 'venture capital'.

The nexus: how teaching influences research

Not surprisingly, most examples of how teaching influences research arise from work with senior students who raise questions and issues that fundamentally alter the investigations. With two or three years of seminar engagement behind them, these students are part of a lively intellectual climate. University staff and industry partners believe that the seminars result in robust and creative research approaches.

Research-only staff

Environmental management is involved in many projects/consultancies with industry, including major state agencies such as Parks Victoria for whom it conducts specific assessments. These include, for example, habitat assessments to provide guidelines for redistributing populations of native animals such as koalas. Strong links with and funding from industry allow the School to hire a considerable number of research-only staff. This is unusual within the University of Ballarat. In Environmental Management these research-only staff do no direct teaching or research supervision, although they may participate in seminars.

The nexus in the context of Boyer's four scholarships

Martin Westbrooke admitted to initially being sceptical about the Boyer framework. 'This is what we're doing. What does the framework add?' But he notes that after more reflection 'I grabbed it with both hands because I could see the ways in which it integrated things that were fundamentally important to our discipline. It fits the perspectives of industry and the University while catering for the diverse activities in which we are engaged.' These same ideals are spelled out in a 1999 paper written by Philip Candy, PVC (Scholarship) at Ballarat, entitled Knowledge navigators and lifelong learners: Producing graduates for the information society.

Supporting and encouraging research and staff in the School

All academic staff have opportunities to teach in their own research interest areas and are encouraged to develop their approaches to teaching. Martin Westbrooke acknowledges the pressures on staff but sees opportunities for them to upgrade their approaches to teaching through research. He describes the research activities of his School as being 30 per cent basic (Discovery), 40 per cent strategic (Integration) and 30 per cent applied (Application). All types of scholarship have value for the School and its staff and meet the strategic goals of the University to develop strong regional, industry and

consultancy links. Consequently staff in this School are well placed to demonstrate their achievements for promotion.

To foster research activity the School provides staff with regular 'mini-sabbaticals' by clustering teaching within the semester. This clustering permits staff to have four weeks free from classroom teaching within a semester to write or to conduct fieldwork. Martin Westbrooke acknowledges the need for better institutional incentives to support flexible timetabling that will facilitate research.

School of Information Technology and Mathematical Sciences

Contact details: Professor Binh Pham, IBM Chair in Information Technology

This example illustrates how a highly productive senior researcher organises students at undergraduate and graduate levels to work with her as co-researchers in a School with few research-active staff and a desire to retain students through to Honours and postgraduate study. Changing a School where permanent staff have neither the skills nor the incentives to do research has led to some creative solutions.

Information technology naturally attracts students with an interest in and capacity for computer programming. As one of the areas where students readily find well-remunerated work, students may be drawn to the field by the lure of employment rather than thinking about research opportunities. As Professor Binh Pham pointed out, the path from undergraduate to postgraduate studies is not always clear in this field and frequently contradictory. Since her appointment to UB as the IBM Professor of Information Technology she has sought to find ways to lessen the gap between undergraduate and postgraduate study in IT and to establish a strong research program where there was none four years ago.

When Ballarat became a University in 1992 the IT courses were

hands-on, certificate oriented courses that gave students no background in research. Many staff were only doing vocational type teaching which, if it involved any research at all, included only soft research such as educational evaluation. They had no real sense of enquiry. It was a carry-on from the history of this place as a CAE.

Progressively since her arrival, Professor Binh Pham has mentored and worked very closely with a few staff who have potential in research. Still small in number, they are nonetheless productive and highly successful in

securing both competitive grants and industry collaborations. But this expertise has largely divided the School into two quite separate groups—researchers and non-researchers. It has not yet been possible to engage the latter group (which is much bigger) in research activities.

Binh Pham characterises the difference thus:

Some staff who do no research and only teach want everything spelled out for them. Then they also do this for the students. They go to textbooks for solutions. They want things to be precise and directive. It is very hard to convince them to put an open-ended question or problem to the students. Some lack confidence and equate good teaching with problem closure. This encourages students to expect to be spoon-fed. There are units which involve mainly teaching specific packages of software by leading students through manuals step-by-step and students are not encouraged to be independent and seek further knowledge by themselves.

Here a challenge has been to establish viable postgraduate and, more recently, Honours programs in a context that has meant ‘undoing’ the problems created by restrictive teaching approaches in the first two years.

Establishing an Honours program

For students to stay for Honours when the lure of employment and good starting salaries is so strong, the program has to be attractive. A viable program rests on students being challenged in the earlier years. So Binh Pham first addressed what might be done at third year level to encourage students to complete Honours. Unable to convince her staff of the capabilities of students, she introduced a third year unit where she assigned real-world problems from her own research to the students and left them to solve the problems as best they could. Because of the rapidly changing knowledge within her field she developed new, fluid unit outlines that gave broad descriptions of new topics and allowed her to incorporate emerging dimensions. Honours student numbers went from two to ten students in just one year.

Now promising students are identified at the end of their second year and invited to participate in a summer scholarship program where they are given their first taste of research (her projects) and asked to find solutions. This opportunity excites students and the summer intensive, which covers a few topics in depth, provides some of the framework not covered in the didactic units in the previous four semesters of undergraduate study. As a result of the second year summer scholarship program, students become excited about IT. By including one further summer program at the end of their third-year,

Honours students may complete their degree in three and half calendar years. Now many want to stay on for the rich experiences the program offers.

As a way of conserving her own time, Binh Pham provides group interactions for different levels of students working within the same project. This incorporates both social occasions (e.g. barbecues) and more formal research exchanges.

Research students and staff are now a more cohesive group. The establishment of a fortnightly colloquium and a common room that postgraduates share has quickly built a climate in which people discuss their work. However, it has also served to further divide research-active staff from teaching-only peers who chose not to attend the colloquia. Reflecting on this division, Binh Pham recognised that change rests on people's goodwill. She also recognises the need for patience and persuasion and to see the longer-term evidence of the students' success.

Selecting areas of research focus

Binh Pham has been highly successful in attracting competitive Commonwealth research grants. Industry offers some opportunities too, although many fewer than in North America or Europe where more developmental work is commissioned. On the whole she reflected that 'industry collaboration takes us away from research because of the nature of the problems they want solved'. Where possible she focuses on grants in her areas of expertise in computer graphics and image processing. She then assigns aspects of these projects to students to solve either on their own or in teams, depending upon their goals and hers too. The students, she notes, were initially resistant to the idea of sharing because 'all they could see were the differences in their problems'. Now through the small groups she runs for the students she supervises, they 'see the commonalities within the field. They understand how as scholars we learn from one another.'

The challenges of success

IT graduates have good career opportunities and tend to be highly mobile. This is a particular challenge for a regional university such as Ballarat which makes a considerable investment in its young postgraduate students and staff only to see them snap up offers in corporations or universities in Sydney and Melbourne. 'A significant effort goes in to helping them attract their first large grant and then after that they go.' So the task is to create continuity, first between the Honours and the postgraduate students, then postgraduates and postdoctoral students, and lastly between the postdoctoral students and Level A/B staff. If this can be achieved, then there will be greater returns from the

research clusters that sustain the longer research projects and provide teaching mentors.

In real research projects everyone learns. The students see me learning. As a teacher/supervisor I build their skills systematically through the process, but they also teach me new things. Having the research clusters saves us all time on projects. It increases the interest of staff and students and creates an impetus for progress. Students are doing the research and contributing to the reports. The international students we have from the Netherlands and Germany come here technically competent and share with our students many of their skills. They have a 'hard-work' ethics and provide good models for Australian students.

The importance of the teaching research nexus

IT is a high demand and rapidly changing area. If there is not a nexus, students will be out of date and employers will simply not want them or have to spend considerable money on training them. We would like to increase the number of postgraduates but industry tells us they don't want them trained to this level. So these graduates go overseas where they are in high demand and their expertise is lost to Australian R&D efforts. The production of research-strong graduates has to be linked to national research initiatives and a national development strategy.

Boyer's four scholarships

The explicit split of academic work into four types of scholarships as described by Boyer has no real benefit for Binh Pham because she believes these elements are already integrated in her own work. She feels it is artificial to apply them within her School and believes that this is a frustration for many staff.

It's a dream put down on paper by the executives at the top. It's rhetoric that does not link to staff. Superficially we put things into their boxes, but the spirit isn't there. The framework hasn't stopped staff attaining promotion because they learn how to play the game with operational levels within the University. While it is good to have a coherent framework for presentation, does it change the outcomes? I think not. I believe the institution has to be more selective and not treat everyone within the same framework. Equity means giving people the same opportunities so that they can achieve their potential. It does not mean to always divide everything equally, regardless of people's capability and commitment. To continue support for those

who do not achieve or show little interest won't raise the research standards. So I keep our focus on quality by monitoring outcomes. That's where I put my effort.

Ongoing impediments

I struggle constantly with the matter of carrying staff with no research interests. I also have an up-hill battle to retain a critical mass. With significant staff movements, it's hard to be selective about areas of concentration. This is a challenge to both our teaching and research. It's not an easy problem to solve.

School of Nursing

Contact details: Dr John Fisher, Research Officer, School of Nursing

This example demonstrates the potentially important role of professions in driving changes both in the teaching/learning approaches within the undergraduate curriculum and the scholarly activities of staff in a profession that is developing its scholarly base.

Context

The UB School of Nursing, like others across the country, offers both pre- and post-registration courses to undergraduate and postgraduate students. Many current teaching staff were originally hospital trained and moved into tertiary teaching when nursing was offered within CAEs. When the Ballarat CAE became part of the University of Ballarat demands were placed on staff with nursing diplomas and certificates to gain first degree and, later, postgraduate qualifications. Although few in number nurses with PhD qualifications are now more common, and an increasing number of teaching staff have recognised the importance of pursuing a higher degree by research if they are to sustain an academic career. All the UB Nursing staff are qualified to at least Masters level, with one third completing a PhD, many well into their professional career span.

In 1999 the School of Nursing appointed a research officer to work with staff as they developed proposals, applied for funding and published their work. The School recognised that, without such a person, it would be difficult to develop the research output needed to sustain the professional base linked to attracting good staff and students—especially postgraduate students. Many staff within the School had only relatively recently completed higher degrees;

there were few people to act as research mentors within nursing (fewer in a region such as the west of Victoria); but there was a strong commitment from staff to developing research. The roles of the research officer include sustaining staff enthusiasm to see projects through to completion, publication or dissemination; finding different ways of generating outputs that might influence health practitioners in the community to see the value of research; and shaping understanding within the profession that research is fundamentally about finding answers to problems in practice.

Developing and strengthening a teaching-research nexus

Nurse education is changing fast. Postgraduate certificates and diplomas are no longer driven by coursework requirements designed to enhance specific skills. Indeed research-based courses are now the 'norm' as health practitioners are required to work within a framework of evidence-based practice. This demand drives teachers towards assisting students in locating and evaluating research evidence. As a consequence the teachers themselves become involved in designing their own research programs to evaluate efficacy, approaches and contextual variables.

The recency of this shift is such that it results in tensions within nursing between the employers' goals and those of university staff and professional accrediting bodies. Unduly concerned about the educational changes, some employers resist staff achieving higher levels of knowledge and proficiency.

Increasingly the experience of the teaching staff is that the rhetoric and the practice are the same.

We used to teach students how to do things, now we teach them why we approach a condition in this way. We used to work largely or exclusively from textbooks, but find that texts quickly become redundant or out of date. So we focus increasingly on student projects to investigate selected topics rather than covering the content we used to.

The process of moving to an enquiry-based curriculum has been challenging. Staff noted that this has not been an easy shift to make. Some clinical teaching staff were initially resistant, others uncomfortable about exposing what they did not know, while the additional work required to identify or support students in locating appropriate learning and research resources was sometimes unwelcome.

One staff member noted the burden that supervising compulsory third year projects placed on the few research-trained staff in the School. Initially students were free to choose their own topics. Now they are guided to select topics within theme areas where supervision is available. Not only does this

ease the burden for staff, but it also increases the quality of the experience for students, and allows the School to meet the quality outcomes for supervision demanded by the University.

The professional requirements for accountability and evidence have been instrumental in the process of moving staff away from traditional (didactic) teaching. Because students find few nurses in community placements with research experience, they encounter a research 'mystique', a lack of interest in researching practice, and arguments that research is not core to a hospital's or centre's business. The School staff trust that this will change as more graduates emerge from enquiry-based programs. Attitudes may also shift as collaborative projects are undertaken between the University and health care agencies in the community.

How teaching is influencing research

Not surprisingly, at this developmental stage within the profession, teaching has some powerful influences in shaping research. The field is being re-created through enquiry. Thus, one staff member noted that as a result of teaching students about how to manage aggressive patients, she started to ask questions about the aggressive behaviour of staff and the culture of the hospital. This line of enquiry became the subject of her PhD. Another noted stress-causing factors in nurses in intensive care units, and developed a proposal that resulted in a collaborative research project between the University and the hospital.

Teaching off-shore in Hong Kong has also proven a fertile ground for research projects as staff are confronted with a different cultural context, different interpretations of the meaning of illness and wellness, and many contrasting approaches to health policy and practice.

The importance of strengthening the teaching-research nexus

These staff expressed a strong view that 'teaching only' institutions, departments or schools no longer have a place in contemporary higher education.

The world demands flexible, adaptable, problem-solving practitioners who know how and where to locate the latest information and to evaluate it critically. They can't do this without being taught through research.

Another noted:

Best practice is research based. Regional universities must have the same levels of support to teach their students to the same levels as metropolitan universities. In fact, even more so for there is often less supervision and professional consultation available. It becomes an equity issue.

Several staff commented that research is an 'evolutionary' process for UB and that Nursing clearly reflects this process of evolution. This School is able to sustain support for research partly through teaching full-fee paying overseas students. Whilst recognising the value of this additional funding, staff fear that if research infrastructure funds are cut to the smaller, regional institutions such as Ballarat, the pressures will increase to find further overseas students to provide funding for research activity. Time for research is restricted somewhat by the necessity to chase external funds through teaching more students in faraway places. Should research activity be funded this way? What are the consequences? The money is handy, but it places extra strain on staff.

Boyer's four scholarships

While the concept of Boyer's scholarships sits comfortably with Nursing staff, there is considerable discussion about the meaning of the four scholarships.

They are artificial categories for us. It doesn't have much relevance in our day-to-day work, but it does help when you are applying for promotion and some forms of University funding. Nursing can make the framework work.

Appendix B

Case vignettes: University of Western Australia

Department of Agriculture and Resource Economics

Contact details: Professor Rob Fraser

The Faculty of Agriculture is one of the few to have a project-based experience in place as a requirement for all its undergraduate students—whether doing Honours or not. The Faculty has also introduced a first year ‘integrating unit’ to assist students to appreciate the relevance of the core curriculum. This interview highlighted the nexus as ‘process’ within departments and the University.

Background

Professor Rob Fraser sits on the University’s Teaching and Research Nexus Working Party and has been involved in discussions about the nexus in this context. He is also convenor of one of its working parties currently investigating the role and functions of Research Centres within the University. As a Head of Department and academic leader within his Faculty and the University, he sees a particular leadership role for Heads in fostering a nexus.

Views of the nexus

In Rob Fraser’s view, teaching and research ‘bump into each other’ whenever one is engaged in research supervision. Supervision of students is, in his view, the most powerful example of the nexus because teaching and research are occurring simultaneously and often reciprocally.

The nexus here is a process and not a structure, although much of what we discuss in the Working Party has to do with structures.

The Faculty of Agriculture runs a four-year undergraduate degree program.

The teaching farthest from the nexus (and by this again I mean process) is first year teaching. As a first year teacher myself, I engage and entrance. I want students to be engaged with ideas and teaching

in an entertaining way is my best weapon. I'm there to stir interest, not to pack a suitcase. If I light the fire of imagination, I see it spread. There possibly are people who can engage first-year students with research, but it's hard.

In their first year of study students undertake an enquiry-based unit that complements their discipline studies in Mathematics, Chemistry, Biology and Economics. This fifth unit takes a topical approach and is designed to assist the student to see a rationale for studying the other units. This puts problems into context and shows how they might be explored. Hardly any student fails this unit, possibly because they are motivated to study within it and the unit employs 'powerful pedagogical tricks' including contemporary issues such as salinity. 'This comes closest to a research activity.'

Students have an enriched learning experience as they proceed further. Agriculture is unique at UWA in requiring its students to undertake an independent project in their final year. Only those who complete this project to set standards are awarded Honours. Rob Fraser is unsure whether all students are better off doing the project. For some students and their supervisors the experience is 'filled with grief'. Students complain about having to do the project, but not about having done it and most students would like the project to be given additional weighting to reflect the amount of work involved. An oral examination is part of assessment through which the student can enhance the mark assigned to the written work. 'For the students, the project is probably at the heart of what they experience as a teaching/research nexus.'

The role of the Head of Department in fostering a nexus

Within his Department, teaching loads are managed through a combination of interest and research. Wherever possible staff have opportunities to teach in areas related to their research interests and activities. 'The DVC can't mandate this to happen, but heads of departments can make these sorts of connections work if they spend time with staff planning how to manage the curriculum.'

Within this Department, few staff have had the experience of supervising a research student through all stages of the process. If a nexus is to be fostered then Heads, in his view, need to monitor what is happening in supervision and publication. Only 20 per cent of papers in the department are co-authored with students. If supervision is the heart of the nexus, co-authored papers with students need to be encouraged.

Again, only Heads are likely to be aware of such findings. It is up to them to redress the difficulties or attend to what needs to be changed in the department's workings to alter the situation.

The same holds true for postgraduate students and research-only staff. Heads are the people who can enrich them and the department by bringing them into the whole range of departmental activities, especially such things as seminar programs.

The nexus, promotions and awards

When preparing an application and teaching portfolio for an award last year, Rob Fraser confronted the difficulty of knowing where to record his activities as a supervisor. Is it research? Is it teaching? In the end, since it was supposedly a teaching portfolio, he called it a teaching and supervision portfolio.

It highlights the nexus. Supervision is both. While supervision may be a pimple on a pumpkin in other universities, and therefore not such a big issue, research supervision is a major part of my academic work—both research and teaching. The same (problem of categorising and reporting achievements) also holds true for promotions. By categorising activities as we do, we create a problem that should not exist.

Department of Anatomy and Human Biology

Contact details: Professor John McGeachie

This Science department interprets its teaching task in the undergraduate years as conveying the methods of the discipline to students. While teaching and learning are enquiry based, for this academic, they are not necessarily or usefully research based. In a three-year science degree, and with current academic workloads, it would be difficult to accommodate a 'capstone' experience for all students.

Background and context

The Department of Anatomy and Human Biology teaches students studying for degrees in medicine, dentistry and science at undergraduate and postgraduate level. Within the University of Western Australia and his discipline Professor John McGeachie is highly regarded both as a teacher and an active researcher in his field. He has been promoted from lecturer through to a personal chair during his academic career at UWA. Renowned as an excellent and engaging teacher, he has always carried a heavy undergraduate teaching load while also supervising postgraduate students and continuing his own research. However, even though excellent in both teaching and research,

he does not see a necessary nexus between teaching and research in undergraduate education.

The teaching/research nexus

John McGeachie views discussion of the nexus as an extension of the existing University culture. He commented that unlike the early years of his work as an academic, one is now expected to be a good teacher. He observes that the University has done a great deal to facilitate teaching through the work of the Centre for Staff Development. Indeed, the Department has benefited from funding to develop sophisticated and highly successful computer-assisted learning (CAL) programs and research into teaching is now an integral part of careers of several staff in the Department. His view is that some staff enjoy some areas of academic work (teaching or research) more than another, and that generally the Department has been able to accommodate differences while preserving the expectation that all staff will engage in carrying responsibilities in each area. It is his belief that when staff have some choice in what they do, they do it better.

You can't force people to do research and it doesn't make a lot of sense to try to measure it in a quantitative, comparative way. The Department doesn't closely monitor research except through the reports that go to the University. But staff need to understand the effects that this may have upon their career progression and be given chances to renegotiate their position. Fortunately, within this Department we've been able to plan teaching well ahead, including keeping an eye on new developments. In most cases staff accept allocations of teaching, and those of us who really enjoy teaching do more.

Like others of his colleagues at the University, he sees a natural nexus between teaching and research in postgraduate teaching and supervision.

The nexus works differently in postgraduate teaching and supervision than it does in undergraduate teaching. Research supervision brings teaching and research together, as does mentoring junior academics. It's just a natural part of the process and we need to encourage this role more.

He is less certain that there is an evident nexus for undergraduate students.

I think that staff can and do become excited teaching undergraduates. Teaching undergraduates has changed considerably over the years. Increasingly we direct them to find out things for themselves. But there are always those who like to have facts and

resist the change. Dissection was also an enquiry-based way of learning, although we're losing this aspect. Students now access a wider range of learning options. We now set up teaching through small groups, CAL, CD-ROMs, cadavers and text sources. In Histology, which is largely now taught through CAL, students really like the learning and respond well to it.

For John McGeachie enquiry-based learning does not necessarily imply a nexus, although he concedes that the more able students discover one in the course of their learning and many develop an interest in research and in undertaking postgraduate research degrees.

The developmental foundations for a later research interest stem from effective first year teaching, even though this teaching occurs in large classes and is primarily didactic.

The keys for me in good undergraduate teaching derive from what you do in the first year. We have 500 EFTSU students in first year Human Biology. You put your best teachers with these first year students. Yes, it is a huge expense and requires great energy, but the benefits flow on, even though there are significant numbers who never do more Human Biology because they take it only as a service unit for another degree. During lectures you show them how to evaluate information, introduce the facts in the area, and demonstrate how to enquire further in the discipline. While you can open up problems for them in tutorials, such as those underpinning genetics, genetic engineering and abortion, it's not really research.

Potential benefits of studying at a research-intensive university

John McGeachie believes that UWA students can and do benefit from studying within a research-intensive university.

The way that students benefit from being in a research-intensive university is that they experience the research environment in all areas, although it may not be too direct. They have teachers who are able to give them an overview of concepts because they deeply understand their fields—they don't give details or bore them with technology. The teachers impart an attitude and approach to enquiry in the discipline. They make sound decisions about what to talk about and how to talk about it to students to enthuse them about the discipline.

He is less convinced about the desirability and feasibility of having all undergraduate students undertake an independent project during their final year.

The 'capstone' experience proposal is a wonderful philosophy. But it's logistically impossible. I expect many students would not want to do this sort of project. I would prefer to see it as an option for those who want to pursue it. We have to remember how stretched our current staff are with increasing workloads and demands. Supervising capstone projects would add to the burden and possibly produce considerable resistance unless it was appropriately resourced.

Teaching and research for promotions

John McGeachie believes that, notwithstanding changes to value teaching more, the University's expectations are still unequal, and research is given higher weighting. While it's not totally research-based, he observes from his experience on promotions committees that the weighting for promotions 'is probably still 75 per cent for research, with evidence that your teaching is adequate. There are a very few examples of people promoted more on teaching, but they're hard to identify.'

He uses this information and experience quite explicitly when mentoring junior academic staff.

When I mentor junior staff, I tell them the facts. I also ask them what they want to do with their careers and help them to explore the path options. The good scholar who produces research publications will be fine. But others who want to follow their dreams and passions in other directions (especially teaching) need to develop a better balance between the two.

Impediments to a nexus

John McGeachie rejects the notion held by some academics that teaching undergraduates impedes research activity and weakens the nexus.

Teaching doesn't weaken the bond per se because it's part of your responsibility as an academic. However, increasing loads and the consequent depletion certainly erode time and energy for research. It would be good to have more junior staff to assist with teaching, but there isn't the money to hire them. No one now buys himself or herself out of teaching in this Department. They recognise what the consequences are for their colleagues if they do so.

The greater impediment in his view is the time taken from core activities to seek research grant funding.

Competing for money is a real challenge. For those of us with established grants, it's still tough. But for younger staff without an established record, it's nigh impossible. That's where mentoring and support through collaborative work become very important.

When senior staff can assist their junior colleagues towards successful grant applications, these junior staff gain a stronger footing on a research track which serves them well and develops their competence as postgraduate supervisors.

Graduate School of Education

Contact details: Professor Roger Slee, Dean

Graduate schools of education are places where a nexus between teaching and research should be evident both in the subjects studied and the professional training undertaken. In this graduate school, the Dean describes ways in which he is addressing the nexus through new research programs and revised structures.

Context and background

The UWA Faculty of Education provides pre-service teacher education only through a Graduate Diploma of Education. All other programs are for teachers who wish to gain further qualifications or attain research degrees. While most courses are delivered to local students, others are available to country teachers in intensive mode and some are delivered offshore. The University recently merged its research and teaching activities with those of Murdoch University's School of Education to take advantage of the complementary strengths of each university.

The nexus in Education

For Roger Slee, the nexus within Education needs to be made quite explicit for students. During their undergraduate (pre-service) education, students often have little exposure to research or a research base for educational practice. Their postgraduate education needs therefore to imbue them with a sense of how people conduct educational research and how it informs the practice of teaching. Since teachers are themselves the subjects of research, they should be reflexive about the impact and outcomes of such activity. Part of the task of a graduate school of education is to ensure the nexus. Research

should enhance teaching in prospect and researchers should be identifying ways to grasp this opportunity.

Considered realistically however, teaching about research in education varies as it does in other disciplines. For example, an educational historian who is teaching about colonial education and its impact may have limited opportunities to teach their research. For a co-researcher in international education there are likely to be many more opportunities, especially for raising some important issues in methodology.

For Roger Slee research is part of one's disposition. If one wants to encourage it as part of teaching practice, then the disposition is best encouraged through reflective and enquiring practices from the start. For teachers, there is an inevitable tension between skills, class management and research-like questions. Doubts about performance plague the neophyte teacher for classroom teaching is always challenging and difficult. Developing a research disposition in postgraduates is not always easy.

Leadership issues

Within this Faculty, the curriculum and teaching are designed around staff wherever possible. One aim is to reduce a feeling of isolation among the teaching staff by creating critical masses and groups that can also be used to supervise students. Unlike the SMEC at Curtin University, students at UWA are fairly free to choose their own thesis topics, and adjunct supervisors are brought in to assist when necessary. The creation of clusters of researchers brings benefits for the processes of supervision, which Roger Slee sees as a critical nexus. These benefits include:

- less isolation for both the supervisor and the student;
- enhanced use of peers among staff and students in supervision;
- greater pastoral care for students and more opportunities to engage in solving problems and resolving negative emotions;
- small tutorial group supervision that reduces individual meetings;
- input to both students and staff comes from a greater range of perspectives;
- opportunities for students to teach supervisors; and
- less intense personal forums than one can find in one-to-one supervision.

Building and sustaining a research culture that enriches teaching means moving away from structures that have been good for some individuals. Increasingly this Faculty is providing colloquia and research forums, inviting international visitors and scholars for short stays, and working towards the

establishment of a Research Centre for Inclusive Education sufficiently broad in scope to encompass all staff interests.

Policy does the symbolic work

Roger Slee, like his colleague Rob Fraser, accepts that responsibility for fostering the nexus can only really be done by Heads within their academic units. While institutional initiatives have an impact, it is at a symbolic level. Important as this symbolic work is, the DVC cannot effect direct change. The Faculty Research and Teaching and Learning Committees can press home some advantages. The rest is in the hands of the Head.

Roger Slee wrestles with the tension through teaching/research allocations for his staff and the implications they have for promotions. In his view, teaching counts

significantly less for promotion than does research (although the value placed upon teaching is increasing). Community service, while valued within the Faculty, plays the least role in promotions decisions. The first adjudication is publications, grants and awards. Then come teaching evaluations from students, and some peer review in the case of teachers in the Dip Ed. Teaching portfolios are playing a part in teaching awards.

Professor Alan Robson is a major driver in enhancing the status of teaching and raising the question of the nexus. Both are valued because the value comes from the operational peak of the organisation. Our task as Heads is to assist making this work back through the structure and through the managerial heart by demanding different fund distribution and different performance indicators. Staff have to be more central players.

Why strengthen the nexus?

In Roger Slee's view one of the major reasons to strengthen the teaching/research nexus is to bring the benefits of the research-intensive university more directly into teaching both undergraduate and postgraduate students.

There is a perception that as a research-intensive university our teaching is not as good as elsewhere, and that the University doesn't value teaching very much. Teaching ought to be better and more consistently evaluated alongside research with better evaluation measures. I suspect that the material is there for a wonderful undergraduate curriculum and that there is a general desire on the

part of staff to improve performance, but we have some way to go. In my view the way to progress this is to press the Executive Deans and department Heads to place the issues more centrally on their agenda and provide infrastructure for effective staff development to support different initiatives.

Department of English

Contact details: Professor Hilary Fraser

A distinctive feature emerged through this vignette—that of the role of publishers in shaping the writing of critical texts for students and learning resources that integrate research and teaching within the discipline. This relatively recent phenomenon in English provides an invitation to scholars to make research accessible to different groups of students at a level that best suits them.

The English Department has the distinction of being the University's inaugural winner in 1999 of 'best teaching department'. Probing the ways in which they constructed a departmental teaching portfolio revealed a well-established process of balancing and integrating teaching and research in the face of changing undergraduate and postgraduate demand in the discipline.

Context and background

This University's English Department has a long and distinguished reputation for teaching and research excellence, but like other Humanities disciplines has to work hard to maintain student numbers in the context of funding and staffing cuts. How does one offer new units to 'enliven' or rejuvenate the curriculum offerings when restricted funding prohibits hiring new teachers? One solution is to tailor former units into new forms—old wine in new bottles if you will—so as to engage the talents of all existing staff but in new endeavours. Another is to enable staff to bring their new and changing research interests to their teaching. Both solutions maintain a teaching/research nexus for staff, inviting teachers to rethink how they frame their scholarly work to accord with themes in new units and conversely how they frame their teaching in the light of exciting new developments in their research field.

Maintaining a teaching/research nexus during curriculum revision

Where teachers are able to teach from their research areas, there is a clear nexus compared with teaching beginning units. While it is not always possible to teach in the area of one's research at first year level, it becomes easier as one moves into teaching higher level students. However, the Department has been able to find ways to incorporate specialist interests of all kinds and persuasions into the changed curriculum at all levels. A unit on Romance, for example, allows the incorporation of Medieval and Renaissance texts into first year teaching, enabling these works to be read and discussed alongside modern popular cultural texts such as Mills and Boon. Eighteenth-century writings are included in a unit tracing the development of ideas of modernity. As the curriculum evolves, we have also constantly to review it against the backdrop of staff interest and identify how we can best relate the teaching and research. This has not always been an easy task, but by working collectively academic staff have arrived at ways in which all staff can contribute their own particular specialist strengths to the undergraduate teaching program while simultaneously recognising the importance of catering to changing student interests and ensuring that they are offered the opportunity of exposure to the newest ideas and approaches in the pedagogical field.

The teaching/research nexus in publication

Hilary Fraser also identified ways in which the publishing industry is shaping the nexus through demand for scholarly work written primarily, although not exclusively, for undergraduate students. This can be related to the radical reforms to the university system in Australia and overseas of the past few years and the consequent change in the nature and composition of the tertiary student body that constitutes the principal market.

Increasingly, the canon is being redefined to include texts from diverse authors whose work has not always been mainstream. The curriculum now includes such genres as diaries and letters written by women or those with less formal education whose work was once not considered worthy of publication. Compilations of writing into teaching anthologies have led to a parallel demand from major publishers for companion critical volumes for students. The scholar preparing these critical texts has to please different and distinct audiences: peer/scholar reviewers, teachers in a variety of courses and institutions, and student users. Hilary Fraser notes how hard it is to write such volumes.

There is an inevitable tension between making the canon accessible and 'dumbing it down'. Achieving an appropriate voice for these

audiences makes this some of the most demanding scholarly writing I undertake. But teaching shapes my ideas in important ways because I have to think through how I might use the material myself when I structure courses, what I assume as background, what details I put into the footnotes, and what aspects I want to leave students to explore.

She also notes that:

This writing leaves less time for publishing monographs. That work has to wait until I have sabbatical leave. But it is also becoming harder for newer researchers to get into the monograph market as publishers focus more on the lucrative undergraduate market.

Preparing a Departmental teaching portfolio

From Hilary Fraser's perspective, the University's move to value and reward teaching and learning through a Departmental award has been significant and

more effective than the national teaching awards that go to individuals. It has engaged us as a group of academics collectively and systematically in thinking about our practices, how effective they are, and what we might do better or more effectively. We had to review our several activities, policies, philosophies and bring them together into a coherent framework. We had to think about how teaching and research enabled one another. The exchange of ideas helped us to learn more about what others in the Department did. It took months to prepare, but we were led and supported by a Head who is particularly interested in and committed to teaching.

To teach English well means that there is enough time for marking and commenting on students' work in ways that help develop their thinking and writing skills. This has to be done within the framework and constraints of semester-length courses. We also have to be realistic about what students can read, and read critically, in a limited time. In making material accessible to students we have to work hard. These demands create a potential tension between teaching and research time which we have to continue to find ways of resolving.

The nexus in postgraduate supervision

English has maintained high postgraduate student enrolments. To enable the continuation of high supervision standards in the context of increasing workloads, the Department complements its core practice of one-to-one

supervision with the monthly meeting of special interest groups for postgraduates and staff. These groups bring together teaching and research while broadening the supervisory experience for both staff and students. We can also make use of these groups for professional development purposes. Out of them come opportunities for both postgraduates and their supervisors and other researchers in the field to discuss work in progress, to shape conference papers and research proposals, and to receive critical comment on articles to be submitted for publication.

Good departments like ours mentor and encourage the professional development of their postgraduate students. The new University initiative to offer postgraduate teaching internships moves this from the ad hoc to formalised arrangements that provide departments with a model of best practice. The result will be good for students whether they have academic or other career trajectories. This is yet another example of how paying attention to the nexus between teaching and research pays dividends for both students and staff.

Law School

Contact details: Dr Paul Moyle, Senior Lecturer in Criminal Law and Sentencing

This case study illustrates the integration of teaching, research, community service and professional engagement in an undergraduate unit taught in the Law School of a research-intensive university. For the unit coordinator/lecturer, the teaching of this unit is a way of integrating scholarly and professional concerns and redressing some legal social injustices.

Introduction and background to The Unrepresented Criminal Appellants Scheme

The introduction of an elective component within Criminal Procedure and Sentencing units of the undergraduate Law program at UWA illustrates a different use of a major teaching and learning reform—service learning. Service learning identifies service to the community as an integral part of the teaching and learning process. Throughout universities the kinds of service students engage in take many forms: for example providing assistance to individuals in need; providing tutoring and other types of educational outreach in schools and community organisations; or undertaking field-based studies such as documenting toxic wastes in a given area. For some years now academic legal staff have organised for law students to take part in Legal Clinics that offer a range of advice to people who would otherwise be unable to afford legal fees.

The Unrepresented Criminal Appellants Scheme (UCAS) assists unrepresented appellants who are appearing before the Western Australian Court of Criminal Appeal. (Fuller details of the scheme are available through <<http://www.law.ecel.uwa.edu.au/law/UCASBackgroundPaper.htm>>.) The Supreme Court of Western Australia and the Ministry of Justice are funding the scheme with the University providing strategic matching funds. All stakeholders will benefit if the scheme succeeds. Part of the motivation for the Scheme derives from the impediments Superior Courts face in encouraging members of the legal profession to undertake pro-bono representation in the appellate jurisdiction. Unrepresented litigants need accurate advice concerning the preparation of, and submission of, documentation for appeal purposes to the Court of Criminal Appeal. The issue is who prepares this advice for litigants and the lawyers.

A key part of the UCAS is the introduction of a clinical component into the undergraduate curriculum for the units Sentencing and Criminal Procedure for a two year trial period, during which time the Scheme will be comprehensively evaluated. Appropriate cases are identified by the Court of Criminal Appeal and referred to the Coordinator at the Law School. Approximately twenty students may enrol in the elective each semester. Students will work in small groups under the direction of a Supervising Solicitor. The students form small 'simulated firms' and undertake the following tasks:

1. attend the prisons after approval has been granted to assist an unrepresented appellant;
2. interview that prisoner and take instructions;
3. undertake research on the likely grounds of appeal;
4. obtain transcripts of the trial proceeding;
5. prepare draft grounds of the appeal and the outline of submissions;
6. prepare a brief for consideration of the supervising solicitor; and
7. prepare Appeal books.

The scheme and the nexus

The scheme has demonstrated educational purposes as well as a solid professional rationale. It also contributes to a teaching/research nexus through the evaluation and publication components of the study. As Paul Moyle says:

The UCAS will meet important community needs by promoting pro-bono legal representation for those who are financially disadvantaged. A successfully operated scheme will enhance the public image of the legal profession, judiciary and participating law

schools. It will also provide an opportunity to introduce and measure curriculum innovation for practice-oriented law units.

Paul Moyle's publications include scholarly contributions to legal journals, legal education journals, books and major reports to state governments on criminology and prisons issues. From his perspective, these varied contributions are all personally and professionally important, although only some are recognised within the University system for promotional purposes. He notes that a recent commissioned report for the Queensland Government on its prisons was much harder to write than several journal articles, and has had a major impact on prisons policy in that State, but received no recognition from DETYA in terms of weighting.

From his perspective, the teaching/research nexus would be strengthened through encouraging and developing appropriate links between professions, agencies and industry to innovative pedagogy and published evaluations.

There needs to be a proper balance to include and recognise this form of scholarly work. We have to value more diversity. Universities are an extraordinary community resource of expertise, innovation and energy, and we use but a fraction of that talent.

Contracted research-based consultancy needs to be recognised and valued especially when it has an impact upon policy and bureaucracies (although sometimes they choose to ignore the work too!) I don't think of my work in terms of what I need to do to gain recognition in the system, I think of it in terms of what I want to achieve to promote legal and social justice and what will make an impact. Many journal articles have absolutely no impact at all on practice or thought. The UCAS scheme is quite unique in that sense.

Department of Political Science

Contact details: Associate Professor Jeremy Moon, Head of Department

This vignette illustrates a nexus in social sciences teaching through students' 'real world' experiences in linking theory and practice in a Political Science unit. This Head, who has well-formed philosophical approaches to teaching and research in his discipline, doubts the efficacy of some institutional initiatives.

Context and background

Like many other such departments, this Department of Political Science in the Faculty of Social Sciences offers a raft of undergraduate units to students who wish to include these as part of majors in Social Sciences, Humanities and in double degrees.

A teaching/research nexus in political science

For Jeremy Moon,

teaching about research is my mandate in Political Science. To have students engaged in a seminar or round-table discussion with ideas in formation results in longer and deeper conversations and understandings. In the process of discussing your research, students see where ideas come from. The dangers are, of course, either that it can become an ego trip for the lecturer, or that the levels of technicality of the research are beyond the students' current achievements. But, in my view, these risks are worth taking.

I have found teaching to have a significant impact on my research. Some time ago I decided to teach a course on British Politics. This coincided with my writing a book on contemporary and 'Thatcherite' British politics. Explaining the ideas to undergraduate students was a very good discipline because you can't assume they will understand key concepts. Clear explanations means minimising obfuscation. Students raise basic objections to your arguments. This requires one as a teacher to be more specific. It certainly clarified my thinking.

Because politics is so much in the daily news, students raise their experience of the world of politics in class. Consequently teachers' research notions and assumptions are constantly tested. Research is used to shape issues within the Department's curriculum. Increasingly the Department is using team teaching. Jeremy Moon observes that the most active researchers in the Department 'make best use of research material in their teaching.

For the first time this year, Jeremy Moon has introduced a placement component as part of third-year policy unit. For some years now the Department has had a parliamentary internship scheme. The internship linked a small number of students with politicians. However, the outcomes were uneven and the projects that students undertook were not always so much policy driven, as they tended to reflect the MP's pre-occupations of the day. Now all students enrolled in PS326 are assigned to a policy unit within a Commonwealth or State Government Department or other policy-related

organisations (e.g. business associations) specifically to research—and in some cases to develop—policy within a discrete area. Regular seminar support is offered through the Department. The experience makes explicit for students the complexities of policy development. In a written component students record how the organisation and its work fit into the policy process. While the research-into-policy projects are supervised by the host organisation, they are subject to the scholarly rigour and structured requirements of the Department. In short, the unit operates as a form of ‘real-world learning’ with students contributing directly to a variety of agencies and policy initiatives, while being supported through reflective seminars within the Department.

Preliminary evaluation suggests that the organisations have welcomed and valued the students’ contributions and several students have been invited to participate in policy planning meetings and conferences, sometimes presenting their own research work. Inevitably, some weaker students have found this assignment a challenge, as have their supervisors. Notwithstanding these problems, the policy project component will continue. The ‘real world’ experience is valued by both students and those who may well become their employers. Among the Department’s staff, it is seen to conform to demands for rigorous teaching and learning. It provides a clear demonstration of how skills can be used in real contexts, rather than finding out after graduation.

Institutional policy and the nexus

Having an allowable emphasis on community service for promotion weakens the teaching/research nexus in Jeremy Moon’s view. He believes that community service is a ‘given’ component of what academics (or at least those who see that they can make such contributions) do ‘as a matter of course and duty.’ He is a frequent contributor of articles to newspapers on range of issues, including the recent Republic debate. He observed that, in marginal cases, community service was used to justify a promotion.

Believing that measures of staff load do drive wedges between teaching and research, he would nonetheless like to see

a reflection of research effort and productivity in the teaching formula. Research-active staff could buy out teaching. They might still contribute occasional lectures on specialist topics or themes, but much of the heavy teaching at first and second year level that also includes heavy marking loads could well be done by postgraduate students.

While in principle supporting the University’s postgraduate teaching internship scheme, he would wish to see the financial incentives halved. ‘Students should be pleased to get the qualification. In this Department, they gain teaching experience anyway.’

One concern of his is that ‘too much emphasis is placed on students’ perceptions.’ Without other corroborating data, people get rewarded for teaching for the wrong reasons. He would exhort those charged with leading the University to

trust the scholars. Most people are really doing their best, and their best is pretty good. The better researchers are better rewarded, and that’s probably appropriate. We could really enhance the research culture in the University by fostering occasions in which the top researchers are able to talk with each other. What we need are initiatives that encourage interdisciplinary work and conversations across the divides. Where there is excellence across structures, it has not come from policy, but from good people finding ways and means.

School of Public Health

Contact details: Dr Fiona Lake and Ms Sally Reagan

Problem-based learning as an enquiry-based learning method is a more marginal illustration of the nexus. While it does not bring research explicitly into teaching, it imbues students with a sense of how to gain answers through a range of enquiry methods including research.

This vignette also shows the effects of the curriculum change on a lecturer’s teaching and research and the need to find a new personal nexus.

The context: problem-based learning in a revised medical curriculum

Problem-based learning (PBL) is premised on the idea that powerful learning best occurs when students are working to solve problems rather than studying blocks of classified knowledge. During the 1960s, the founders of the Faculty of Medicine at McMaster University in Canada committed themselves to this concept and put PBL into practice. Instead of taking the traditional two or three years of basic science courses before beginning a clinical program, students are confronted with real patient or clinical problems, starting on the very first day. Students work in collaborative teams and on self-directed projects, and the academic staff play a variety of innovative instructional roles as resource persons, unit planners, advisors, disciplinary consultants and assessors. Many medical schools in Australia and overseas have adopted the McMaster model. UWA is introducing a greatly expanded PBL program in 2000 in both early and later years of the Medical School program. The PBL program will be multidisciplinary.

PBL, through its enquiry base, inherently embodies a nexus between teaching and research. Indeed, so successful has PBL been that approaches have been extended to agriculture, business schools, and other areas where case-based methods of teaching and other close-to-practice pedagogies have long been in vogue. However, PBL methods are different from bringing research into teaching. Students engaged in PBL have experience in using different sources of information including research and research literature. Working collaboratively in small groups with set problems, students engage in reasoning their way to possible solutions to clinical problems. Each problem focuses on a common, treatable condition or focuses on a process, such as might be needed to adopt a public-health solution to reducing obesity and diabetes.

What impact does PBL as a teaching method have upon research?

For Fiona Lake

all of teaching of students in the clinical arena (PBL, bedside tutorials, ward rounds) stimulates the clinician to continually review their own practice, and the underlying evidence for their practice. At times the clinician is stimulated to act on the inadequacy of data to devise new research projects.

The revised curriculum also contains a component where students do research and collaborate with faculty members over part of fourth year. This project experience has been in place for some time. Although this will, in all likelihood, continue to be a group project, it has the impact of a 'capstone' experience for the students. The University of Melbourne includes a full year of research for its students within their revised curriculum. It's an important step. Medical students must graduate knowing how to work in a context of changing practice, how to understand research and how to use it wisely. They also have to understand how research influences what you choose to do as a clinician—how you solve complex clinical problems. I hope they are excited by research and that they don't see it as separated out from the work they may undertake in general practice or elsewhere.

Unfortunately when finances are tight, as they are in hospitals, it is easy to sacrifice the nexus between teaching and research, to go for more didactic teaching, to forget about enquiry-based learning and to stress clinical care. Our move to PBL may be one way in which we can retain an emphasis on how good teaching and learning come together through enquiry-based learning.

Implications of a move to PBL for the career of academics

Sally Reagan's background lies in teaching and research in epidemiology. Her recent secondment to guide the implementation of the PBL curriculum is having significant effects upon her current academic career decisions. In the new medical PBL curriculum, epidemiology *per se* disappears. As overall PBL coordinator Sally Reagan spends much of her time on curriculum and staff development while sustaining a significant teaching load. Long skilled in the philosophy that 'you must practice what you teach', she is now at personal and professional crossroads. What she recognises she can do is undertake different scholarly work to investigate the implementation of PBL pedagogy in the new curriculum. As a Faculty-wide consultant she is in a unique position to reflect and write about implementation and the details of the process, including the training issues for academic and clinical teaching staff.

The recent demands upon her time to devise the problems, advise and work with staff in preliminary staff development have seriously compromised her research. However, she recognises the potential to use the data gathered through the initial phase and into the next few years to compare success across tutors, departments, student groups and problems to comment upon PBL from the perspective of an educator/scholar.

In preparing her own materials for PBL, she is in sympathy with clinical staff who also are concerned about the impact of the curriculum changes on their ability to sustain research productivity.

We underestimate the time and effort required to achieve desired quality outcomes from teaching. As clinicians move from doing the occasional lecture and tutorial in their area to sustaining six or more weeks of PBL tutorials, it poses huge additional demands upon them. The new PBL tutor role also adds an extra load on top of their role as a clinical tutor. While there will be great long-term gains for everyone, it's a sea change.

Appendix C

Case vignettes: Curtin University of Technology

School of Applied Chemistry

Contact details: Dr Roland de Marco

In the literature, Science has been identified as an area where a nexus in undergraduate teaching may be less evident, or less easy to identify. This case shows how a lecturer addresses the nexus in his undergraduate teaching in applied chemistry. It also illustrates well how preparation for undergraduate teaching provided the stimulus for published Discovery research.

Context

Curtin's School of Applied Chemistry at Curtin provides a strong research environment for all its students. The research carried out in the School is biased towards the applied end of the research spectrum. Hence most of the results are of direct relevance to the needs of commerce and industry. Because of this bias, strong links have been forged between industry and the School, and many of the research projects are undertaken either through industrial sponsorship, or jointly with industrial partners. Besides the academic staff who participate in research, there are usually 4–6 postdoctoral fellows, and 25–30 PhD and MSc students.

The main areas of activity are Petroleum Chemistry and Geochemistry, Applied Inorganic and Mineral Chemistry, Crystallization Studies, Electrochemistry and Corrosion Studies, Environmental Chemistry, Drinking Water Treatment Chemistry, Analytical Chemistry, Forensic Chemistry, Mineralogical and Archaeological studies, Natural Product Chemistry and Polymer and Resin Chemistry.

Highlighting the nexus in undergraduate teaching

Undergraduate students who study in the School gain first-hand laboratory skills and have opportunities to understand the relationship between research in the discipline and its applications to 'real-world' problems. In their first year, concepts are often taught through everyday examples. For example, a

colleague (Barry Thornton) engages student interest by starting with questions such as: What is the research base that leads to toothpaste having the consistency and composition that it does? What is the chemistry of kidney stones? Roland de Marco believes that 'teaching students in lively relevant ways assists them to retain the material and to understand it well.' Because much of his approach is applied, Roland de Marco brings this directly into undergraduate teaching through case studies that reinforce theory in the context of its applications. Teaching in this way, he notes,

provides the opportunity to set more challenging problems for students. Ideally, it would be an advantage to change the balance between continuous assessment and examinations to place a higher value on assessment through small-group/tutorial based problem-solving that better develops the students' critical and original thought processes; however, our resources limit us.

Student projects

In third year students undertake a Chemistry Project. This is an important part of the Curtin course giving students experience in solving a real-life problem and the possibility of publishing a scientific paper as a result of the work. Roland de Marco, like many of the staff in the School, is active in pursuing research and development projects, usually related to industrial problems. Some aspects of this work are often suitable for student projects, giving the students the opportunity to contribute to industrially relevant research.

An example of how teaching undergraduates led to published research

Roland de Marco was greatly influenced in his approaches to teaching and learning by Professor Pip Hamilton, at the University of Tasmania. He remembers his mentor telling him 'a good teacher is made even better by being a good practitioner of her/his discipline, which in the University context involves the conduct of a rigorous program of scholarly research.' Professor Hamilton instilled in him that being an effective teacher of undergraduates rests, in part, on being able to explain complex concepts and principles simply and effectively. In preparing for undergraduate classes, Roland de Marco has found this one of the most challenging aspects of teaching. In revisiting theory that he thought he understood before he came to teach it, he gained insights that led to published peer-reviewed research that described how to solve new theoretical problems in his discipline. Without the prompt that undergraduate teaching provided him, he seriously doubts that he would have done this research—a process that has proven gratifying and motivating

for him as a teacher. He wonders: What other new insights are there to gain from revisiting theory?

Researching pedagogy

Within the School of Chemistry is an active team of researchers who, along with their primary research, also research pedagogy. They have published extensively in the *Journal of Chemical Education*. Some research is based around innovative laboratory experiments that allow students to discover chemical principles and to derive applications. In their CEQ evaluations, graduates rate these experiences highly because they enable them to graduate with skills that industry also values.

In the eight years Roland de Marco has been an academic, he has developed both his teaching and research as he found one reinforced the other. Initially he did little research. 'By teaching through a case method, I found that examples from my own research worked best. And I needed to develop further examples. So I did more research.'

I have also found good rewards from teaching ñ from students, from my head of department, from the University through, for example, reflective teaching practice sessions run by the Centre for Educational Advancement. Professor Hamilton and my current colleagues have all indoctrinated me into the importance of good teaching, and the nexus between teaching and scholarly research.

Flexibility in promotion criteria has also been important. When I was promoted last year I was able to decide how to weight my research and teaching in ways that reflected my activity in the context of this School. Now I have somewhat established myself as a good teacher, I can see my research activity increasing and establishing myself as a researcher in my main field. And this will help my teaching.

School of Biomedical Sciences

Contact details: Dr Bob Dunstan, Head of School and Ms Georgina Fyfe, Lecturer

This case vignette highlights some funding impediments to the nexus in science-based courses and some solutions too. In the case of service teaching it describes how a School has found creative ways to teach large first year classes while improving learning outcomes for students. Costs associated with laboratory project work influence the extent to which undergraduate students can be offered opportunities to conduct laboratory projects.

Context and background

The School of Biomedical Sciences undertakes high quality, innovative, fundamental and applied research.

Research in the School is conducted in:

- Epidemiology and mechanisms of drug resistance in the bacterium *Staphylococcus aureus*
- Biochemistry of insulin, diabetes and the rational design of insulin mimetics
- Molecular and immunological analysis of candida
- DNA profiling and molecular genetics
- Clinical aspects of medical laboratory science including structural studies of tissues
- Role of sex steroids in human cancer
- Teaching and learning research in the biomedical sciences
- Epidemiology and social issues of health

Where possible, the School encourages research activities which use molecular procedures in order to maximise the use of equipment and foster collective laboratory skills. This policy seeks to encourage over the long term the development of a strong research profile based on communal activities while also facilitating associated applied research which is derived from the more fundamental activities. The School is cognisant that research that addresses societal problems in an integrated manner will result in maximum use of resources.

From the most recently available data the School ranks first in the Division of Health Sciences in terms of total annual research funding and total research funding per FTE staff member.

The nexus in a service-teaching context

The School teaches a number of service units. Within the Division of Health Sciences the School is responsible for Human Biology service teaching to all first year Health Science students ñ some 1000 students per semester twice a year. The two semester-long units traditionally had students attend two hours of lectures and a one-hour laboratory session (in small groups) each week. Over some years, the teaching staff in Human Biology 133 tried a variety of different approaches to lecture-style large-group teaching. However, despite their best intentions, teaching staff noted little change either in the student evaluations of teaching or in the overall pattern of results, including numbers of students who received supplementary examinations for borderline performance, failed or repeated the unit. Following staff development

workshops in 1995/1996 on conditions that encouraged active and deep learning in students, the teaching staff in this unit agreed to stop trying to 'tweak the edges' and to adopt a tabula rasa as they reconceptualised what might be needed to significantly change learning outcomes. The imperative included arriving at an approach that was cost-neutral for the School.

Through sustained group planning, they arrived at a model involving for HB133 of 'learning groups' of 40–50 students each. Each group meets with a tutor for a two-hour session based around small group activities requiring collaborative learning and involving group assessment. The syllabus objectives were re-visited to retain the conceptual frameworks and core understandings while reducing the emphasis on retaining and recalling details. Strategies already known to be successful were retained. These included, for example, science dramas to engage students in understanding principles of cell membrane permeability and protein synthesis. The published workbook written to support this teaching approach has funded some in-service sessions for part-time tutors.

Since the students largely come from other Schools, service-teaching areas have, in the past, seen such large cohorts of first-year students as a means of generating money for other activities. Under changing service-teaching arrangements within Curtin, all Schools with service teaching obligations must now invest time and energy into teaching to meet the learning outcomes of the different professional programs—other than in generic ways—to retain their role as service teaching areas. The School of Biomedical Sciences has invested the time of several staff to deliver effective courses for these new-to-university students.

First year teaching together with other pedagogical enquiry is the research domain for a number of staff within the School, and they are recognised as leaders in their field. The research team includes staff whose particular areas of postgraduate study lack senior or mentor staff doing substantive research in the area. Consequently there are more limited opportunities for these staff to teach at honours or postgraduate levels. So staff have made deliberate and informed career choices to advance through the Scholarship of Teaching and Learning in their discipline.

Impediments to the nexus

The research activities of staff in areas such as Molecular Genetics and Biochemistry are an integral part of their teaching with upper level undergraduate students including those enrolled for Honours programs. However, one enthusiastic teacher starts students on projects in their second year, some of which contribute sections of published work. Significant

numbers of students proceed into Honours and subsequently PhD studies. The rigorous Honours program results in several students' work being published as original research, related in many instances to the supervising academic's research interests and foci. Supervisory support comes from both internal and external (industry) staff who suggest possible projects for students to undertake.

As the Head of School, Bob Dunstan, noted:

Research costs the School money. The costs of laboratory science training are high. In the case of upper level research students, projects run into thousands of dollars. In the case of PhD students the additional costs can range between ten and thirty thousand dollars—moneys which are not covered by the returns we get for attracting research students. However, we find the money from as diverse a set of sources as we can to retain our research activity and profile. Funding reductions pose serious threats to the training of laboratory scientists, as does the proposed 'accommodation leasing model' that the University is exploring whereby Schools pay for the space they occupy.

Leadership issues for the Head of School in sustaining the nexus

This School appoints staff as specialists within discrete areas of biomedical sciences whose primary role is teaching, research and supervision in highly specialised and rapidly changing fields, such as molecular genetics. For such staff the nexus is integral to their academic work practices. However, quality first-year service teaching in Human Biology is also a critical component for this School. Those staff whose energies are devoted to service teaching as a primary commitment could well be denied opportunities for advancement within or outside the University. Retaining such staff and creating promotional opportunities for them to progress their careers is a major challenge for Schools responsible for service teaching. By attending to scholarly bases for their teaching, they contribute to the School both through research and the funding they generate from equivalent full time students (EFTSUs). Large research grants flow relatively readily to the scientists, but not to the pedagogues who have nonetheless successfully attracted smaller research grants.

The Head's task here is an important one. Bob Dunstan notes that his role is to maintain two foci in this School—to facilitate staff doing what they do best and value both dimensions of activity. My greatest need is to increase research supervisory capacity and to ensure there are enough high quality supervisors for the laboratory science components so we continue to produce graduates with both high-level knowledge and hands-on laboratory experience. And I have to balance this with attending to the careers of those

who carry the large service teaching load of the School. Here we have to both lift and maintain performance for ourselves and for Curtin and to do so in ways that enhance prospects for the staff and the School. I believe we have capacity to translate this service-teaching work into key initiatives in distance and on-line, offshore teaching and through this to create major opportunities to raise the profile of these staff. Perhaps we can even think of a Teaching and Learning Institute for Biomedical Sciences!

Curtin Business School

Contact details: Dr Jeanne Dawson, School of Accounting

This vignette illustrates impediments to the T/R nexus for staff employed as 'service' teachers in a School or Department whose disciplinary focus is otherwise quite different in scope and direction. It shows how such staff can achieve a nexus between their teaching and research through the Scholarship of Teaching. It also illustrates how later-career academics, especially women, may define a values context for their academic work that can shape their personal career directions.

Supporting and developing communication in the School of Accounting

The 1990 Mathews Report on Accounting Education recommended that accounting graduates undertake units covering generic communication skills. Current professional course accreditation for Accounting includes requirements in spoken and written communication. In 1993 Curtin Business School appointed Dr Jeanne Dawson to create a first-year communication unit that would address the concerns raised in the Mathews report. Since then her role has widened considerably. Her first commitment, however, is to produce Curtin accounting graduates with a level of communication skill and insight that will give them a competitive edge in the employment stakes. She now teaches units in each of the three years of undergraduate study and offers two at Masters level, to local, international and offshore students, internally and through Distance mode.

There are potential impediments to the teaching/research nexus for staff whose teaching roles lie in areas outside the major foci of the School that employs them. This is especially true when the School has a primarily procedural learning paradigm (as Accounting does) and Communication courses employ one that is more conceptually based. How do one's peers evaluate such different scholarly efforts?

An additional important component in this scenario is Jeanne Dawson's personal development as an academic. She completed a baccalaureate degree as a mature-age student, before undertaking further studies including both Masters and PhD in Literature and Cultural Studies. Her Doctorate was conferred in 1996. At this time she was offered an opportunity to go to the University of Kent at Canterbury to work with one of her examiners writing a book based on her thesis. Since she already had relatively secure employment at Curtin Business School, and the prospects for an academic appointment and career in Literature and Cultural Studies were less certain, she opted to remain at Curtin and consider how she might pursue her scholarly work in relation to her current position.

Opportunities have come through her increasing involvement in international programs, offshore teaching and the internationalisation of the Business curriculum. International students comprise the majority of students enrolled in accounting. Jeanne Dawson has developed study materials and a teaching style that is appropriately challenging and relevant for local students and accessible to students whose first language is not English and whose cultural experience is different from that of local students. Her 300 and 500 level units have substantial intercultural communication modules that use cultural diversity in the classroom as a learning resource. This work is now the focus of her conference presentations and publications. Within Curtin, she has received grant support through the 'Internationalising the Curriculum' Quality project (1997), and an Innovative Teaching Practice Award (1999).

Where the T/R nexus is strongest

When 80 per cent of your students have a ESL background, there are inevitable issues of quality and equity. I have to deliver high quality courses and in ways that meet the needs of all students. The undergraduate students would be quite happy if I trained them in communication skills. This is not adequate in my view. Accounting students are used to formulae. The easy part would be to give them more of the same. My scholarship comes to bear in several ways. For example, I use quite theoretical texts that introduce students to underlying premises. One of their tasks is to observe what is happening in communication around them, to find their own examples and to include these in their reflective journals. This allows students to develop their English, their powers of observation and reflection, and to do so in ways that are culturally relevant for them.

In many of my courses I have included language and linguistics because this understanding is important to accountants. The language of accounting is political. The discourse is full of control

words—account, bookkeeper, take stock, audit, statements, register and so on. It's about structuring the world in particular ways. The students are incredulous when I challenge them to think in these ways. So I spend considerable time exploring denotation and connotation. We also cover Bertrand Russell's conjugations. And they remember these aspects. The reflective writing in their journals is sometimes quite extraordinary as they explore these ideas and share their observations and interpretations of events and encounters.

In my teaching I'm able to put cultural theory and cultural change into practice. Epistemology is what I am working on now. I have found myself absorbed by needing to know how to teach in this complex environment.

The challenge of teaching international students has led Jeanne Dawson to explore the research literature on group processes and participation, conflict management and varieties of pedagogical approaches. Teaching and learning, cross cultural communication and participation in the culturally diverse classroom are the areas she brings together in her scholarly endeavours.

This example illustrates well how the concept of learning forms a scholarly bridge between the way Jeanne Dawson's students are being challenged (her teaching) and the ways she enquires into the framework of her own activities (her research).

Impediments to the T/R nexus

Schools of Business have large student enrolments. Curtin has Western Australia's largest undergraduate Business classes, including the greatest number of international students. Those staff who show concern for international students, and who are prepared to spend time assisting them with English, are natural magnets. Given the areas in which Jeanne Dawson teaches, it is no surprise that considerable amounts of her time are spent in student support and administration. She plays a key international leadership role within her School. As she says:

Many of my roles involve neither teaching nor research. With women, especially Muslim women, I am a natural point of contact. Students quickly come to know that I understand how cultural and linguistic barriers operate to exclude and marginalise. As a woman, I lurch in to do things within the School and with students.

Jeanne Dawson raised the question of ‘what counts’ as worthwhile publications within the system. From her perspective,

power is really important in the nexus. Once you have a research profile, it's easier to move on. You have more freedom. In Accounting research is all about how and how much. And I want to ask—Who cares? Why? and What for? These are not popular questions but they are important to me.

What I do with my time has to feel worthwhile. In some of my scholarly work, I am not yet ready to publish. It's too new for me. I need to reflect more about it. There are still significant gaps in my knowledge and understanding.'

She has published writing guides including a successful ‘Pocket Guide to Successful Study’, which netted no internal recognition as a publication, but which has been highly valued by students. She refuses to ‘publish for publishing’s sake’. However, she has assisted several colleagues to get their work published, acting as a writing consultant for them within the School and Division. She acknowledges in this respect that ‘being on the margin is sometimes a good space to be in. It allows me to work comfortably in some diverse ways.

Electronic Commerce Network

Contact details: Associate Professor Bernard Glasson, Information Systems

This case report illustrates aspects of the nexus working in a new area of endeavour—e-commerce—through an elaborate partnership arrangement involving the University, businesses and international scholars who teach and supervise research. It shows a nexus forming from teaching and research as tandem activities that are later integrated through the activities of PhD students. The example also raises important questions about traditional research degrees in areas of rapidly changing knowledge.

Context

The Electronic Commerce Network (ECN) is a Curtin University teaching and research unit sponsored by a large bank. It was created in anticipation of the global uptake of Internet-based business made possible by the universal availability of the World Wide Web. ECN has a threefold mission:

- to develop and run degree courses in Electronic Commerce for the Curtin Business School (CBS);

- to be a focal point for Electronic Commerce research and development for the Western Australian business community; and
- to be a vanguard for on-line education within CBS.

ECN is engaged in three activities—education and training; research and development; and technology transfer and commercialisation. ECN uses a ‘network’ of human resources to carry out its functions in a synergistic way. This network includes local teaching and research faculty from Curtin; local, national and international teaching and research associates from university or industry partners; and ECN’s research students. ECN achieves synergy through its *modus operandi*.

Background history

In 1995, the Curtin Business School (CBS) took two Internet-related initiatives. First it launched two courses entitled Internet Functions and Facilities—one at the undergraduate level and one at the postgraduate level. At the same time it allocated ‘priority project’ funds to develop a business plan for an industry-sponsored teaching and research entity that was to become ECN.

As one of the largest business schools in the region, CBS decided to take a pro-active, community-focused posture with regard to Electronic Commerce. But it needed to do so in an imaginative way. Any new phenomenon like this had to be understood; methods and procedures to enable technology transfer needed to be discovered and promulgated; and skilled human resources to apply it needed to be developed. But skilled human resources to undertake the research, development and education work in this new field were practically non-existent; and the university entities undertaking this work would need in time to become self-funding. Research indicated that whatever initiative CBS took, it was likely to be among the first to do so. There were few exemplars. Whatever CBS did would be novel. Therefore CBS adopted a ‘think big—start small’ strategy to focus on the end game while managing the risk involved in getting there.

The ‘start small’ aspect of the strategy involved doing two things in parallel. First a series of courses and programs in Electronic Commerce were evolved in line with market demand. Second a network of world-experts was drawn together to provide advice and guidance on the form and direction the field of Electronic Commerce might take.

The ‘think big’ aspect of the strategy also involved doing two things in parallel. First CBS began a search for an appropriate major industry sponsor or partner to join with it in the Electronic Commerce venture. The sponsor would need to provide material support for the venture until it was

established. But perhaps more importantly, the sponsor or partner would also provide entrée to the business community.

These two parallel strategies came together as ECN, which was launched in July 1997 and became fully operational in January 1998.

Tandem teaching and research activities

Electronic Commerce was a new, rapidly emerging, and multi-disciplinary field. It was obviously going to have an impact on business. What that impact was going to be was less clear—hence the need for research. In order to capitalise on this new phenomenon, in whatever form or shape it might take, the community would need skilled human resources—hence the need for education. For the community response to be efficacious, ‘models’ (be they opportunity models, implementation models, exemplar products or processes) needed to reach the community quickly; hence the need for technology transfer. For a university to deal with this phenomenon from a business community perspective called for a holistic approach. The approach needed to address research, education and technology transfer.

A key issue was the shortage of qualified human resources. The education and training function needed educators. The research and development activity needed researchers and research supervisors. Until the research program was established, ECN would have little to ‘transfer’.

The nexus through PhD study

From a staffing viewpoint, an on-line learning environment gives considerable flexibility. ECN’s preferred model of courseware development and delivery is to engage funded PhD students to do that work guided by one or two expert international ‘subject area advisers’ and managed and mentored by an ECN or CBS staff member. By allocating the PhD student to courses that are compatible with their doctoral research, the program aimed to create a ‘win-win’ situation. That is, the PhD student is being paid to work in their area of research and the resultant courseware is of high quality as an expert team develops it. Under this arrangement the educational program, to an extent, underwrites the research by providing a minimal level of funding for the PhD student.

The research component

One of ECN’s aims is to be a focal point for Electronic Commerce research and development by building a team of PhD research students supported by a network of local, national and international supervisors. In order to do this,

ECN had to find funding to support its PhD student cohort. Due to the competitive nature of grants and scholarships, and the strictures of the annual award cycle, ECN had to find alternative means of funding of PhD students. ECN's way around this is to engage PhD students to undertake some of the on-line education activity. Thus there is a synergy between the educational activity and the research activity. This synergy is made tighter by matching the doctoral student's research interest to their assigned education task, and by engaging one of the international 'subject area advisers' as the student's supervisor or co-supervisor. Ideally the ECN or CBS academic assigned to manage and mentor the PhD student in their educational activity will be the other supervisor too. This arrangement does a number of things.

It creates an education and research 'team' focusing on an aspect of Electronic Commerce from an educational and a research perspective. Funding used to bring the team together on a face-to-face basis for one purpose (e.g. course development) can be leveraged to serve another (e.g. discussions with the PhD student regarding research topics). It builds a network of expertise on a particular aspect of Electronic Commerce that can be tapped by the business community. And because the courses are on-line, it gives the freedom to allow the PhD student to 'visit' with their international adviser for an extended period of time. Because the course is on-line, the work the PhD student has to do on that course in order to maintain their studentship funding can be done from anywhere—in this case from their international adviser's university.

The focus of the research program is Web-based Information Systems Development. The application area foci are small to medium enterprises; the financial services industry; and on-line education.

ECN can currently support some eight funded PhD students. In addition currently there are two students on PhD scholarships. Thus ECN can support an initial PhD cohort of ten. Theoretically this gives a nucleus of between twenty and thirty researchers (i.e. PhD students and the supervisors) which might be available to the WA business community under some mutually agreeable access arrangement. ECN is therefore well positioned to undertake contract research on behalf of the community or to join with individual organisations or consortium partners in collaborative research projects with or without government support. The eventual outcome should be processes or products that provide opportunities for technology transfer or commercialisation. PhD students are encouraged to focus on applied research topics. These topics could lead to the development of intellectual property, which may be developed commercially. Any eventual net (after recompensing the inventors) royalty returns would be ploughed back into education or research.

Leveraging resources for teaching and research

A key feature of the modus operandi is the use of leveraging to effectively double the staff resources without doubling the funding base. Using part of the initial funding to engage three PhD studentships as an alternative to engaging one full time lecturer does this.

The minuses

ECN has had difficulty holding its PhD cohort. While the concept is attractive to potential PhD students in the first instance, the lure of opportunity in the Electronic Commerce industry has proven too strong in several cases. ECN has managed to hold some 40 per cent of those potential PhD students who were invited to take up a studentship.

The PhD problem is exacerbated because ECN has difficulty accommodating two types of PhD. The first is the overseas student. ECN's studentship covers only half of a student's expenses (i.e. either the student's fees or their living expenses but not both). Therefore any student who wishes to take up a funded PhD position with ECN must have their fees or living expenses covered from another source. Well-qualified Australian resident students have their fees covered so the studentship scheme works for them. But overseas students are unable to participate in the scheme without additional financial support. The second type of PhD student ECN has difficulty accommodating is the part-time PhD. Because of the rapid emergence of Electronic Commerce, it is difficult to find doctoral level topics that one can safely assume will last the duration of a part-time PhD without becoming outdated.

Many academics are uncomfortable with on-line education or unwilling to embrace Electronic Commerce as a new (to them) field of interest. Therefore it has been difficult to engage CBS staff in the PhD manager and mentor role.

The style of operation has created problems for ECN in interfacing with current university systems and procedures. ECN's need for autonomy and flexibility in the allocation of staff duties is seen to conflict with the institutional need for collegiality and equity of treatment.

ECN has had great difficulty attracting suitably qualified senior staff to join its small management team. There is a worldwide shortage of suitably qualified senior Electronic Commerce academics.

Education through on-line delivery

From the University perspective, the most interesting aspect has been the evolution of ECN operational procedures to handle mass education through

on-line delivery. On-line education is not simply putting one's lecture notes on the Web. Nor is it distance education. On-line education is about building a flexible learning environment to establish and foster learning relationships. In many ways on-line education is like many other Internet-based businesses. And much of the procedural development is by experimentation and rapid adaptation to new and changing circumstances. Having a functional role in, and a research focus on, on-line education and linking the two is an example of learning by doing.

Research Institute for Cultural Heritage (RICH)

Contact details: Professor David Dolan, Head

This example illustrates some impediments to the nexus that arise with the emergence of new disciplines. It provides evidence for framing and defining a nexus in situ.

Context

In 1994 Curtin University established a Centre for Cultural Heritage Studies. The Centre was given Research Institute status (reserved at Curtin for a few major centres) in 1996. RICH's mission is to develop an internationally renowned Research Institute promoting the investigation of cultural heritage through teaching, collaborative research, consulting to industry and government, and community service.

RICH undertakes and facilitates applied research and development in a wide range of cultural heritage-related issues. It has strong collaborative links with many organisations at the local, national and international levels. It provides access to specialist knowledge and skills in heritage identification, assessment, planning, conservation and promotion.

Consulting projects are undertaken for a range of government, private sector and community agencies regarding:

local histories	corporate histories
conservation plans	policy development
collection management plans	museological feasibility studies
site interpretation	staff training

As befits a Research Institute, the emphasis is on research. Teaching operates within that framework. The Institute offers undergraduate courses in Cultural Heritage Studies only as part of Divisional programs. Graduate Diplomas in

Applied Heritage Studies and Maritime Archaeology enable students to acquire and apply skills and knowledge relating to at least one of a number of specific fields of applied cultural heritage studies including planning and carrying out a maritime archaeology program, building conservation, museum design, curatorial practice and local history research.

Higher degrees by research and coursework are also available providing an opportunity for students to complete an extended piece of original work, and can involve a component of practical experience.

The teaching/research nexus in practical experience

RICH's courses are strongly project and research oriented. David Dolan observes that

the research is real. It is not just going through the motions. It requires real effort and a lot more is at stake than just doing a project. When you are engaged in research for a heritage listing, it may be the only opportunity to provide the documentation required. The work requires significant research—usually much more than for an article or an essay. And it's not a mock exercise.

In his view the teaching/research nexus is at the heart of Cultural Heritage because it is about the application of relevant research skills to the development of a credible profession and discipline in Western Australia. He acknowledges that the issues may well be different at a different time and in a different place, since the context defines the state of play. But in Western Australia, the time is 'ripe' and there is a real urgency to record and preserve cultural history. 'Our contribution to our students, and the community, is through the nexus of teaching with real research projects.'

The nexus is achieved in two main ways—first, through engaging recent graduates to work on paid consultancy and sponsored research jobs, under the supervision of an experienced staff member. An example of such a task would be to complete documentation for the Heritage Council for listing a place on the state Heritage Register. Second, research is also done for museum exhibitions.

Wherever possible, instead of essays students undertake real projects as part of their coursework (often working for impecunious but professionally reputable bodies). For ethical and competition policy reasons, this work is kept strictly separate from paid consultancy jobs, but can be of comparable standard. The educational benefits for students are that they learn from the start to work to a professional standard and they have real experience by the time they graduate. In the example given above, the students' names are

included on the heritage register as co-authors, and this information can be included on their CV. Not surprisingly, the burden teachers carry is made greater in these situations if in order to meet our partner organisations' needs, they sometimes have to support students whose work is not satisfactory.

Masters and Doctoral students frequently choose research topics related to their own employment. Thus they have both an income stream and a deeper interest in the task, although David Dolan also notes the consequent effect on the time taken for degree completion.

All staff within the Institute are active in research. As Head of the Institute, David Dolan believes he has a primary commitment to remain involved in 'cutting edge' projects, not least because the reputation of this new unit rests upon the extent to which it undertakes complex and difficult heritage projects. He notes, with some pride, that the Institute has been involved in about seven of the ten most challenging heritage projects in recent years within Western Australia. With the imperative for research to generate income for the Institute and the University, he wonders if this will be sustainable.

Bidding for heritage projects in the increasingly competitive area of consultancy is a challenge for the Institute. While such projects carry less status than ARC, heritage projects are a part of a Commonwealth Competitive Scheme through the Australia Council. But they are not necessarily recognised or valued as 'research'. In part this relates to the range of other successful bidders or consortia acting as 'consultants' who incur lower overheads and may submit lower bids. The drive for projects not just to break even, but to turn a profit for universities, is a major concern in a new area where it is hard to break into the ARC or other grant sources.

The current fashion for competition is not always appropriate in the Arts and certainly not in heritage where finance is so limited and the needs so great. The effort that goes into competitive tendering endeavours is at the expense of actually doing more research. It's a curse of this whole process that, in my view, destroys academic values as we end up competing with our colleagues across other campuses.

Career advancement

While it is not difficult to mount a case for promotions for Institute staff based upon their scholarship in this area, David Dolan is concerned that the system rewards people for producing small and relatively superficial work and not for sustained significant contributions that may extend over several years.

Outputs and outcomes are easy to shape through the 'top-and-tail' approach to publications. It is highly unlikely that anyone will

produce a significant scholarly book until they are close to retirement. Rising teaching loads also discourage significant output. In a small operation, such as this Institute, there is a constant pressure of administrative work.

Consistent policies whether at a university or Government level don't encourage discipline differences. Why do we persist with the whole idea of refereed papers and the scientific model? This outdated scientific model is fine for chemists and even people who work in well-established areas of the humanities. But it does not work where you are, as we are, 'inventing' a discipline—writing reports that have a social and cultural impact for the community.

Science and Mathematics Education Centre (SMEC)

Contact details: Professor Barry Fraser

This Key Centre for graduate studies in science, mathematics and technology education provides one of the strongest illustrations of the teaching/research nexus. The small number of staff use the nexus to great effect to teach and supervise an extraordinarily high number of graduate students locally, interstate and overseas. The Centre has been recognised internationally both for its research and graduate output.

Background

In 1988, the Australian government recognised the exceptional strengths in science and mathematics education existing at Curtin by establishing the national Key Centre for Teaching and Research in School Science and Mathematics. Its major aims are to increase participation rates, and the quality of students' experiences, in science and mathematics education.

With approaching 500 students from all around Australia and overseas, the SMEC has the largest group of graduate students in science, mathematics and technology education in the world. This includes over 300 doctoral students. Programs are suited to secondary, elementary, community college and university teachers.

Many of the SMEC's students are practising science and mathematics teachers, but the program also attracts teacher educators, science advisors, curriculum developers and leaders in science/mathematics education from developed and developing countries.

The SMEC offers four doctoral programs. The Doctor of Science Education (ScEdD), the Doctor of Technology Education (TechnolEdD) and the Doctor of Mathematics Education (MathEdD) involve one-third coursework and two-thirds thesis. The coursework covers the Key Centre's areas of research specialisation including gender issues, teaching and learning, classroom environment, constructivism, school leadership, assessment, curriculum, computing education and technology education.

The Centre's 500 science and mathematics educators pursue graduate studies on a full-time or part-time basis, with more than half of these studying in the external mode. Several clusters of students are located overseas and SMEC staff travel to these locations to conduct 'professional development institutes' at various times during each academic year. These institutes may include students and staff from universities at that location. Other institutes are run at Curtin, including some led by visiting scholars. The topics for these institutes directly reflect the current research activities of the SMEC staff. During 1999 these institutes for science, mathematics and technology educators included core topics such as 'Writing a Thesis Proposal' together with more specialised curriculum topics, assessment and evaluation, and leadership and development issues.

Maximising the strong teaching/research nexus

The SMEC's coursework and curriculum directly reflect the research interests and strengths of the staff. Intending thesis students are guided into topics that link specifically with staff research in some way. Since the staff have wide research experience with a range of qualitative and quantitative techniques that can be applied to classroom and school environments in secondary and tertiary contexts, students' diverse professional interests can often be accommodated.

The teaching/research nexus is evident in both coursework and supervision. Staff draw directly from their published and on-going research in both contexts. All staff members (only eight full-time in all) are highly active and productive researchers and a high proportion of student work is published with staff as co-authors. Projects include a mix of topics derived from staff research as well as those emanating directly from the education professionals' own backgrounds and interests.

Were there not this strong nexus, the SMEC would be unlikely to sustain its high levels of productivity.

Research on teaching is the scholarly work of all the SMEC staff and the international prestige of the research emanating from the Centre provides clear examples of the scholarship of teaching. Barry Fraser concedes that the

SMEC staff have been able to publish their work in well-established international scholarly journals when other Curtin staff who investigate pedagogical approaches find more limited opportunities to do so. International research and teaching awards have been important in the Centre being recognised within Curtin and nationally. 'It's the old story of someone else having to recognise one's worth, before those around you see it.'

The nexus in postgraduate education

For Barry Fraser, a nexus in postgraduate education is a 'given'. Following a model more common in North America than in Australia, the SMEC offers significant numbers of course-work units in its graduate programs. In addition to specific research methods units other units incorporate research methodology reflecting the lecturer's own areas of expertise. Coursework experiences are crucial in assisting students to identify both a supervisor and a thesis topic.

Although some units are available as Web-based courses, not all overseas students have access to sophisticated technology. Incompatibility between files, computers and systems are a major problem for on-line delivery. Furthermore, Barry Fraser notes the preference among some students (especially international students) for high levels of personal contact with staff and supervisors. Designing instructional materials, teaching and assessment approaches that sustain a strong nexus in the postgraduate programs and meet student expectations is an important feature of the Centre's work.

School of Social Work and Social Policy

Contact details: Professor Richard Hugman, Head of School

Since the Curtin School of Social Work and Social Policy specifically and publicly states that one of its goals is 'to encourage the integration of education, research and practice, so that each aspect of the School is enriched by its connectedness with the others', it seemed useful to explore how it achieved this.

Background

The School of Social Work offers a professionally accredited undergraduate degree in Social Work. The course combines education in a broad base of social and behavioural science subjects with the study of social work theory and practice, in both class and field settings. The social and behavioural

science basis includes the study of sociology, psychology, anthropology and law. In addition, the course contains units in areas of professional knowledge, which are an integral part of social work, namely social policy, research methods, and administration.

Fieldwork is an important part of the social work program. During each of two major placements students are under the supervision of experienced, qualified social workers who maintain links with the staff in the School.

The School of Social Work is committed to the integration of theory and practice. We seek to create an environment in which inquiry and reflection form the basis for the development of skills and knowledge appropriate to the demands of social work and related human services in a diverse range of areas. The work of the School encompasses all facets of practice, with individuals, families, groups and communities, in ways that advance the professional ethics of respect for persons and the pursuit of social justice.

Research activity in the School contributes strongly to an inquiring and reflective ethos. This is to be seen in our research postgraduate programs: Master of Social Work (Research), Master of Arts (Human Services) and Doctoral studies. The active research and scholarship of staff also is a part of the continued development of theories, skills and values in social work and its related fields. Current research in the School includes work on poverty, housing, student learning, research methods and practice, professional ethics, social gerontology, interpersonal violence, multi-cultural practice and youth.

The life of the School is also connected to practice through the active involvement of all members of academic staff in related areas, in direct work with service users and in advisory and consultancy work. This reflects Curtin University's commitment to service to the wider community and, as with our research work, also provides an important foundation for the learning environment that is to be found here.'

School's website information accessed October 1999

Research into field practice

The three areas of education, research and practice came together through internally funded research into fieldwork practice. In 1995, staff of the School engaged in a participatory action research project with students and staff. The results of this study have been published as several refereed conference papers. An edited summary of the research follows. (The full paper appears on the School Website.)

The results of Ramsden's (1991) Course Experience Questionnaire were used as an entry point to explore, through a series of focused groups, meanings students made of the quality of their course experience. As a practice-based discipline, social work education incorporates learning through doing, learning about and reflective learning. A particular focus of the research was on how successful linkages are made between learning for practice and learning in practice.

The initial focus of open-ended discussions was on exploring the first practicum experience and its relationship to student preparatory learning. Particularly, students were asked to identify their perceptions of the strengths and weaknesses of the first eighteen months of the course in preparing them for practice. Later sessions shifted to reflecting on ways in which practicum experiences shaped students' engagement with their return to class-based learning. Staff were kept informed of developments in this ongoing project through feedback provided by a range of School-based committees. They both acted on student suggestions for improvements and fed back to the students, ideas and pragmatic limitations that could become part of further reflections. As the process of these reflective sessions unfolded, students took an active role in initiating topics for discussion and actioning outcomes of these. What emerged was a clearer idea on how students integrate theory and practice. This has fed back into ongoing staff consideration of pedagogical practices.

To effectively link School staff with student input, the researchers had to manage our multiple positionings as colleagues, employees, practitioners, educators, researchers, and gendered beings. Though practitioner skills served them well in being able to keep the project alive among fellow staff, these conflicts in positionings limited the outcomes that could be achieved pragmatically.

A further unplanned outcome was the opportunity to dialogue with field education supervisors on the student experience of their field placement. Fieldwork placement has long been recognised as a central component of the social work education but rarely is there such a focused basis for interactive exploration of the educative role of the field experience. Field educators stated that such affirmation of their central role in education redressed their own perception that they were a marginal part of the academic enterprise.'

This project and its outcomes have also been integral to a Curtin-wide initiative in improving the quality of the First Year Experience for students.

The nexus in undergraduate and postgraduate teaching

Throughout the course, attention is given to theoretical learning, competency development and social work values, with an emphasis on the integration of theory and practice. The program's objective is to educate students to a level of general professional competence and equip them for a variety of social work roles.

Richard Hugman's approach stems from his own earlier experience as a faculty member in a UK department where staff

constantly tested ideas and where students were made critically aware. Professional responsibility and accountability meant that you teased out the relationships among practice and research in the context of your academic learning. The department valued research highly. All our teaching for professional practice came from a research base. It wasn't that research was just a good thing, it was central to what we did and what is taught. It sustained and validated our practice.'

The School's task, in his view, is therefore

to enthuse students through giving them the same research-mindedness. Even though the sorts of units we teach vary greatly, and there needs to be room for different types and 'shades' of research, we are all exploring ideas and testing them. We work in partnerships. And this is especially evident in our third and fourth year students' projects.'

Although research is ongoing, little of it is formally funded,

and it really doesn't need to be, although this is a concern to the Office of Research. Scholarly publications derive from a range of unfunded activities relating to social work practice, ethics, social policy and the like. Research projects that fit within the definitions of research with a capital R as befits the Office of Research definitions are few and far between.'

He uses his editorial experience to work with staff to get their work published and to be more strategic about making their research output 'count'. For him, it is most important how the research links with and to students.

In his role as Head, Richard Hugman is more concerned that there are outputs and staff research activity but he does not mind too much 'what the outputs are.' He recognises that without 'dollars in' his School will be disadvantaged under the DETYA proposed revised research model.

Impediments to a nexus

Promotions and accountability requirements also challenge the nexus in asking staff to define areas where the boundaries are very blurred. For example, staff whose clinical practice involves narrative methods with cases cannot easily report what is teaching, research and practice. 'They work within a dynamic spiral.'

It is becoming harder to create time and opportunities for research in the face of increasing numbers of students and high expectations on staff to support students through the interpersonal dimensions of teaching and practice.

Appendix D

Institutional initiatives

UWA: The Teaching Internship Scheme

Contact details: Professor Alan Robson, DVC

The UWA Teaching and Learning Committee has established a Teaching Internship Scheme for promising doctoral research students to develop teaching skills in their field and to undertake a program of professional development activities during the course of their PhD candidature. The Scheme reflects the University's goals in supporting high quality teaching and learning and fostering the nexus between teaching and research, as expressed in its Strategic Plan.

Overview of the Scheme

The aim of the Scheme, which commences in 2000, is to enhance the future employment prospects of the interns and to assist in attracting and retaining outstanding students at UWA. The Scheme has two components in that it provides seven UWA Teaching Internships covering all teaching and professional development costs, and seven grants to provide half the cost of the professional development component of a departmentally established internship scheme.

The teaching experience, which extends over two consecutive teaching semesters, is tailored to ensure that the intern gains experience in a broad range of teaching and learning skills applicable to their field. In addition interns are required to complete associated formal study and professional development activities. The goals of the professional development program are:

- to encourage interns to reflect explicitly upon the nature of teaching and learning at tertiary level;
- to enable the exchange of ideas about teaching and learning among interns, beyond the field of their own disciplinary specialisation;
- to participate in professional development concurrent with their teaching experience, so that each component of the internship may inform the other; and

- to provide interns with an opportunity to participate in a public forum relating to teaching and learning.

The program of professional development consists of four main elements:

1. Participation in the Foundations of teaching and learning course run by the Centre for Staff Development.
2. The development of a small teaching-related project relevant to the intern's host department drawing on themes and issues raised within the course of work undertaken
3. Participation in selected professional development activities and courses to meet particular development needs
4. Participation in the annual Western Australian combined universities' tertiary Teaching and Learning Forum immediately following the conclusion of their internship.

Each recipient is expected to complete a teaching portfolio for their own use and to form part of their final report to the Teaching and Learning Committee.

The host department's responsibilities are to ensure that interns' teaching commitments contribute to their professional development and accord with departmental teaching and learning initiatives. This requires careful consultation between a student's supervisor, academic staff and the Head of Department.

Participating graduate research students will have opportunities to systematically develop teaching skills in their field, while departments gain skilled tutor/teachers for undergraduate teaching and project supervision.

Curtin University of Technology: Learning Effectiveness Alliance Program (LEAP)

Contact details: Professor Ian Reid, DVC

This project is one which, in Boyer's terms, supports the Scholarship of Teaching and Learning.

Quality enhancement of teaching and learning has usually been pursued at the institutional level through policy development, or at the individual level through particular innovations. A problem with such approaches has been the lack of implementation of quality initiatives at the Divisional or School levels. In order to address this problem, Curtin has committed two million dollars over three years to the Learning Effectiveness Alliance Program (LEAP) to support quality enhancement in Divisions or Schools. LEAP adopts a

longitudinal approach, offers ongoing project support by a team from the Office of Teaching and Learning, and provides rewards linked to identified targets and timelines.

Overview of the LEAP project

LEAP is designed to enhance the quality of teaching and learning by providing financial and other forms of support for several exemplary developments in selected areas of the University. Five projects received the first installment of their three-year grant in 1999 and a further five have been selected to join them for a second triennial round at the beginning of 2000. Those schools chosen are seen as having a strong track record and demonstrated commitment in relation to the objectives of Curtin's Teaching and Learning Plan, and as being able, through participation in LEAP, to make a major impact on other areas as well as their own. Specific targets for measurable improvement in the learning environment are negotiated annually over the three-year period.

There is a rigorous insistence on carefully designed projects that can produce clear evidence of progress towards targets and can disseminate information effectively. Regular formal reports in relation to those targets are monitored by the University Teaching and Learning Committee. The rationale for such a competitive program is that advances in educational effectiveness cannot be achieved by spreading all revenue evenly across the institution regardless of performance. Schools can expect to be serious contenders for funding through this scheme only if they have previously given plenty of thought to ways of making their students' learning experiences more effective, can show that they have assimilated relevant educational research findings, and have started to document and measure relevant indicators as a foundation for further improvement.

One example of the projects that are currently being funded through LEAP is 'Creating a single learning community for on- and off-campus students by provision of consistent and comparable learning experiences through open and flexible teaching and learning' (School of Biomedical Sciences). The main purpose of this project is to bridge the gap between the School's face-to-face and distance modes of education so that learning experiences and interactions are similar in both environments and there are opportunities for moving readily from one to the other. Elements of the project include unit reviews, evaluation of the effectiveness of existing and emerging technologies for this integrated approach, and incentives for staff development.

Another example, spread across several schools that comprise the Division of Engineering and Science, is a 'Student Performance Evaluation Project' that

addresses attrition problems by developing better 'students at risk' indicators, recovery and support strategies, resource packages, feedback mechanisms and staff development programs.

Broadly, the LEAP scheme is attempting to bring to innovative teaching practice the same kind of scrupulous attention to evidence-based scholarship that has long been considered necessary in research.

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