

Principles of Integrating Research into Teaching in Higher Education

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Integrating new knowledge created through research with teaching has become an important area that needs prompt attention with the growing emphasis on student learning activities, quality assurance procedures and research funding mechanisms within the UK higher education system. The link between research and teaching is not automatic. Thus, it needs to be formally created in higher education departments in order to achieve a productive relationship and manage research activities of university staff with teaching duties. The research study on which this paper is based on, aims to develop generic principles to enable transfer of research knowledge into teaching. This study is different from previous approaches in that it looks into the research and teaching link as a two-way knowledge transfer process in the light of growing knowledge management viewpoints. This research uses the case study approach and has conducted five case studies that represent five disciplines. Finally, the research introduces principles of research to teaching transfer that are applicable for higher education institutions.

Keywords: Higher Education, Research, Teaching, Learning, Knowledge Transfer

Introduction

This paper presents the findings of a research study that aimed at exploring the knowledge transfer process from research into teaching in higher education institutions. The study was conducted within an eighteen months period and was undertaken in two phases: an exploratory case study phase and detailed case study phase. Based on the findings, the research study introduces seven principles that could be followed by academic departments in higher education institutions. The literature findings of the study are discussed first covering higher education system, research and teaching link and knowledge transfer literature. The research methodology of this study is explained next. Subsequently, the case study findings are discussed under several sub-headings: key issues, enablers, barriers, good practices and suggestions. Finally, conclusions with principles of research to teaching transfer are offered.

Integrating Research and Teaching – Conceptual Issues

Recent trends in higher education system in UK have resulted in mixed impacts on the research and teaching (R&T) relationship with the growing emphasis on student learning activities, quality assurance procedures and research funding mechanisms (Senaratne et al, 2005). Linking research and teaching in higher education has become an international issue (for example, see Monash University (2003) and Brew (2003) for Australian context; Woodhouse (1998) for New Zealand context). Research studies that have explored the relationship between research and teaching had revealed different outcomes. The quantitative studies, which have considered different outcomes to measure research and teaching, have generally concluded that there is no relationship between university staff research and teaching (for example, see Hattie & Marsh, 1996). Badley (2002) synthesises different interpretations of R&T relationship into five types, ‘an impending divorce’; ‘a marital relationship’; ‘a holy alliance’; ‘a scholarly relationship’; and, ‘a really useful link’. In an impending divorce, separate institutions exist for research and teaching. In a marital relationship, research is viewed as the male partner and teaching as the female partner. In a holy alliance view, research is seen as a generator of uncertainty; and, teaching need to address this uncertainty. In a

scholarly relationship, research and teaching are separate but overlapping scholarly activities. Badley (2002) further adds a 'really useful link' by seeing R&T in an interactive relationship.

To approach 'a really useful link' (Badley, 2002) or 'a symbiotic relationship' (Robertson & Bond, 2001) most academics believe in research-informed teaching, in particular, that good research is necessary for good teaching (HEFCE, 2000). According to Lindsay et al (2002), academics believe that research and teaching is one of 'symbiosis'; 'mutuality'; and, 'synergy', especially when lecturer research activity increased in quantity and quality. According to Jenkins (2000), an effective way to link research and teaching is managing staff research to benefit student learning, which will benefit both students and staff; and, also, will improve knowledge development and learning within universities. However, as most studies confirm, research and teaching are loosely coupled activities, which may not have a necessary or an automatic link; and, therefore, it is necessary to create this link to achieve a productive relationship (Jenkins & Zetter, 2003). Recent studies address this issue and introduce different strategies to create a beneficial relationship rather than the problematic one that naturally exists. Elton (2001) describes those strategies to link R&T depend on various factors, especially, the type of department and discipline.

The extant literature on research and teaching relationship has failed to appreciate research into teaching as a knowledge transfer process; therefore, has ignored useful insights that could be gained from the knowledge age. However, some pedagogical researchers have identified the importance of knowledge management perspectives on university research and teaching. For example, Jenkins (2000) states that knowledge economy demands academics to be creative and gain ability to create; find; and, synthesise new knowledge. Scott (2002, p13) state, "in a 'knowledge society' all students – certainly all graduates – have to be researchers. Not only are they engaged in production of knowledge; they must also be educated to cope with risks and uncertainties generated by the advance of science." Scott (2004), further, laments that in the knowledge society research and teaching are no more separable activities; and, the impact of the knowledge society has been to make research and teaching even more transgressive. Brew (2003) puts across knowledge-based views with respect to research and teaching link. Accordingly, research and teaching are seen as activities where individuals and groups negotiate meanings and build knowledge within a social context. Brew (2003) brings in the concept of academic community of practice where academic departments, disciplines, sub-specialisms, a university as a whole, or networks of professionals interact through face-to-face settings to disseminate research knowledge. Rowland (1996) has also emphasised on the importance of student-teacher interaction, improving interactive settings such as projects, tutorials and seminars in creating the R&T link. Badley (2002) through his 'really useful' link suggests similar views: the importance of dialogical and dialectical processes between teachers and students. Thus, a key finding that emerges through the extant R&T literature that addresses knowledge management viewpoints is the importance of interaction and interactive settings in creating the R&T link.

In summary, the educational research has established that R&T link is not automatic and need to be created in each academic department based on the discipline. The knowledge transfer literature values the importance of student perspectives and maintenance of R&T link following an immediate transmission process. With these key findings from the literature, the next sections move to the empirical stage. Accordingly, the research methodology is explained next.

Research Methodology

This research selected case study methodology due to the context-specific nature of the phenomenon under study. The case study methodology allows to carryout an in-depth investigation of a complex phenomenon within its real life context. According to Yin (1994, p13), "*a case study is an empirical inquiry that investigates a contemporary phenomenon with its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.*" As such, the case study method was considered most suitable for this research. This study was based on multiple case studies, which were of exploratory and explanatory nature.

The case studies were designed by identifying the unit of analysis and a sampling strategy. The unit of analysis considered was academic departments within a university while the study expanded to individual and university levels where appropriate. The sampling strategy was to identify departments that focus on vocational or social science disciplines. Accordingly, study first selected a department on built environment with a 6* research

assessment rating as an exploratory case study. The aim of this exploratory phase was primarily to validate and examine the literature findings. Subsequently, departments that focus on disciplines such as information technology; sociology; nursing; geography; and, management were selected for detailed case studies. The aim of these case studies was to explore the state of art and scope of creating the R&T link in academic departments beyond the built environment discipline. To reach this aim, specific objectives were formulated as follows: To identify specific issues in feeding research knowledge into teaching in each department / discipline; To identify specific enablers and barriers in creating this link in each department / discipline; To identify current best practices in each department / discipline; and To discuss further suggestions to improve the link in individual schools/ disciplines. The multiple data collection methods such as semi-structured interviews, workshops and documents surveys were used to triangulate data. The interview sample mainly comprised of academic staff who perform key academics roles. Interview guidelines were designed in five broad questions to meet case study objectives. The five case studies were conducted in two stages. In the first stage, a key contact person from each case study project was interviewed based on the interview guidelines. Further contact people were identified through this first stage interviews. In the second stage, two more interviewees from each case study project were interviewed. In addition, the documents that provide details of module specifications and department's research, teaching and learning activities were collected through the interviewees and department websites. The case study data were content analysed and emerging themes were identified through pattern-matching between theoretical data and observed data. The final outcome was the development of a set of principles to aid transfer of research knowledge into teaching in higher education departments. The next section discusses key findings that emerged through the case studies.

Discussion on Case Study Findings

Case study findings are discussed under five main sections: key issues relating to R&T link; enablers for RtoT transfer; barriers for RtoT transfer; current good practices; and, suggestions offered by interviewees to improve.

Key issues on RtoT transfer

The interviews revealed several issues related to research into teaching transfer. Some findings were consistent with the extant literature while some were specific to disciplines and departments that were studied. The key issues are discussed below.

First, a key issue that the interviewees raised was use of formal processes against informal processes. Some strongly favoured informal transfer of research into teaching against formal processes. A staff member explained, "*the ideal situation is to transfer research indirectly to teaching. I believe that people who do research are better at teaching. Academics need to be practitioners as well as teachers.*" However, this is not always possible. For example, in disciplines like healthcare, very diverse subjects have made research-informed teaching practically a difficult task. An interviewee described this, "*it is practically difficult for lecturers to be on the cutting edge of research on every subject that they lecture due to the diversification of subjects.*" On the other hand, due to workload limitations it is difficult for every academic to be engaged actively in lectures while delivering good quality teaching. Therefore, many academics believed both formal and informal processes should be in place in an appropriate balance. Many interviewees noted that informal practices are in place and emphasised that missing strategies or workable processes to deal with this issue at a formal level are equally important. Second, interviewees raised the importance of identifying what aspect of research that needs to be transferred to students. The common view was that all aspects of research need to be transferred be they research findings, research skills, research process or research methods. However, majority said that more than delivering research knowledge, 'enabling research' is important. An academic staff member echoed, "*it is not necessarily about gaining research knowledge but more importantly gaining skills like critical thinking... If you give research knowledge it just give them a list of answers. But, research skills will facilitate students' thinking process.*" A further point raised by an interviewee was the necessity of staff mastering research skills in order to teach students. Third, case study data revealed that staff is motivated to inform students cutting-edge research when their teaching modules are closely related to their research activities. An academic in politics elaborated, "*I have research expertise on Italian politics and my teaching modules are built around my research expertise. Last week I wrote a research article and I felt that I could transfer that knowledge to my teaching modules.*" However, curriculum limitations can make this difficult. According to an interviewee, "*it is*

often difficult to have an exact match between the actual real world research and the teaching module objectives.” A lecturer in information technology stated, “research what we are doing is not directly relevant to teaching programmes. Most of staff here is researching on social science aspects. The teaching programmes are aimed at technological subjects to produce IT professionals. So there is this difference of staff research and teaching subjects which creates the problem of transferring staff research to teaching.” Fourth, research to teaching transfer at different levels was identified. Being consistent with the literature, case studies revealed that at undergraduate level the transfer is difficult to postgraduate level. Even at the undergraduate level, the transfer becomes easier at higher levels. In fact, one academic stated, “broadly, research expertise should increase with the level of studies.” Case study data also revealed how different student categories, for example, full-time students and part-time students in certain disciplines, can influence on such a transfer. A staff member in the management department expressed, “part-time students expect practical knowledge more than research knowledge.” According to a staff member in geography, “some students are struggling to find a strong link between their objective of getting a marketable degree and the introduction of cutting-edge research to the curriculum.” However, as some interviewees revealed, in disciplines such as Built Environment, part-time students are more motivated to see research in the curriculum as they know the benefit in terms of work prospects. Fifth, the influence from quality assessment mechanisms was mentioned. An academic stated that Teaching Quality Assessment (TQA) considers research-informed teaching. On the other hand, a responder stated that the pressure to do research by Research Assessment Exercise periodically carried out in the UK (RAE) facilitates the teaching process. In his words, “organising teaching around research is easier. RAE does not hinder this activity. It is much easier when you have done research. For example, materials are already there, reading lists are already there. So the process is easily facilitated.” But, another member expressed strong views on RAE, “I think RAE, in general, is problematic. RAE has made academics to mainly focus on research output, i.e publications. What is needed is staff to undertake good research and disseminate their knowledge to society in a broader sense. This has implications in research to teaching transfer.” Also, another staff member confirmed this. Thus, quality assurance mechanisms have mixed impacts on research to teaching transfer.

Enablers on RtoT transfer

Staff identified the significance of research in the mission statement as an enabler in many departments. A senior lecturer in a research-biased department emphasised, “our school strategy is geared to enhance research-informed teaching. It is central in our mission and a core part of what we do.” However, certain departmental staff noted that in their mission statement the transfer of research to teaching is not explicitly mentioned. Some spotted university level drivers and management structure as enablers for research to teaching transfer within their institutions. For example, one participant expressed, “I think the management structure is an enabler; for example, even academics such as associate dean (research) and associate dean (teaching) teach on courses.” Research strength in research-biased departments is another enabler. For example, an interviewee stated, “research strength in our school is probably an enabler.” Further, the recognised staff and positive attitudes were seen as enablers within these departments. Other departments identified individual staff motivation and the existence of some research-active staff as enablers within their departments. External links with professional bodies, such as Learning Teaching Support Network (LTSN) and links with other universities were identified as enablers by some respondents while others spotted availability of modern and expensive equipment for research as an enabler. In essence, existence of research institutes, funding opportunities and resources were key enablers in staff engaging in research and transferring that knowledge to teaching. A specific enabler that was identified by staff in environmental science discipline was the opportunity to use students in their labour-intensive research activities. As one of its member mentioned, “most of the research in this subject area are practical and labour intensive. Thus, involvement of undergraduates in actual real world research is an effective way of transferring research knowledge into teaching as well as an effective way of fulfilling some of the resource requirements of real world research projects.” In disciplines such as built environment and healthcare a specific enabler was inter-disciplinary working culture. For example, staff in healthcare stated, “move towards interdisciplinary working is, in general, an enabler for research, teaching, working and learning.” In information technology, research is seen as their work itself; for example, an interviewee said that system analysis involves research tasks. As a whole, interviewees stated that in applied disciplines research is more relevant and there is more opportunity to use research in teaching.

Barriers on RtoT transfer. The interviewees were next questioned about common barriers and specific barriers related to their discipline and academic departments. Key barriers identified through the data analysis are discussed in this section. Some of the departments that were case studied were teaching-biased and some were research-biased. In teaching-biased departments the common barrier was the absence of a research culture to initiate such a transfer process. Interviewees mentioned about a division between research-active staff and teaching-only staff in such departments. Another barrier raised in these departments was the less funding and support given for individually motivated staff to undertake research. Some identified that learning outcomes in module specifications limit the flexibility of including new research knowledge into teaching. In research-biased departments, staff noted common barriers such as high workload, time restrictions and resource limitations. A specific barrier in these departments was less motivation and financial incentives for staff, especially research-active academics and research staff, to do teaching. As a result, insufficient teaching is undertaken by research-active staff. For example, one said, *“active researchers are allocated less teaching workload while other teaching staff does a lot of teaching”* and, another said, *“I strongly believe that experienced staff should be teaching on undergraduate courses, especially in the 1st year.”* Another barrier was the less interaction between academics, researchers and students. One interviewee echoed, *“research staff does not have opportunities to work with others and discuss and disseminate their research.”* Specific barriers identified in healthcare courses were the large student batches; high component delivered at the work place rather than at the classroom; and, ethics attached to the discipline. A staff member explained this problem, *“students cannot do research or project-based research work as they cannot interview or visit NHS staff, patients or facilities without passing ethical procedures.”* Sometimes there can be a mis-match between staff research and teaching programmes, which makes a barrier for research to teaching transfer. In vocational disciplines such as information technology and built environment, teaching curriculum needs to focus on industry requirements rather than staff research expertise. For example, academics in built environment mentioned that since the construction industry changes slowly, students may not see direct benefits by including cutting-edge research in the curriculum. Certain barriers were arising from students. For example, common student-side barriers identified by most of the case studied departments were the lack of motivation and participation of students in the programmes. According to one staff member, *“student motivation is a barrier to a degree. It is difficult to get good participation of students for certain subject modules.”* Interviewees further expressed that the aim of most students, nowadays, is to get a paper certificate and they rarely value further learning opportunities. Students generally expect lecturers to deliver all the lecture material and handouts rather than gaining a wider knowledge through self-learning. Therefore, some members doubt about the success of any research knowledge transfer mechanisms. This was evident in one interviewees’ statement, *“whatever you suggest you need to attach a credit value to gain student participation.”* Other implementation barriers that were mentioned were the fear and risk factor such as student’s ability to absorb research knowledge; wrongly designed programmes; and, key staff leaving amidst implementations.

Good Practices of RtoT transfer. Among the good practices observed within case studied departments the following key strategies were identified. First, project-based working, problem-based learning and active learning were seen as good practices where students get the opportunity to understand and experience disciplinary research. Second, special modules such as research-based modules and dissertation module that aim at delivering research knowledge and awareness were recognised as good practices within some undergraduate and post-graduate programmes. For example, a member explained details about such a module conducted in their department, *“final year module, which is a series of seminars conducted by industry people and researchers, aims at making students knowledgeable about current research and industry practices.”* Some programmes were enriched with additional workshops, seminars and guest lectures that give opportunity for researchers to disseminate research knowledge. Third, some staff members noted engaging in research through academic enterprises as good practice that also links to research to teaching transfer. Some of the case studied departments had a strong academic enterprise culture. Fourth, new academic staff recruitments from research staff and PhD students and initiation of new schemes such as Graduate Teaching Scheme (GTA) were good practices observed to this effect. Further, students’ placement-based scheme in vocational disciplines was a good practice that facilitates this process. For example, a respondent described this practice within his department, *“work placements is a good practice here where students get an opportunity to work sometimes as research assistants in the industry; e.g. in parliamentary placements as RAs.”*

Suggestions to improve RtoT transfer. Interviewees offered several suggestions, both general and specific to their departments, to improve inclusion of research in their teaching. These are discussed in this section. Few staff members strongly believed in informal mechanisms rather than formal mechanisms. *“link should take place indirectly through people rather than through strategies or policies.”* However, many academics in case study departments favoured formal mechanisms to boost informal research-based teaching. In fact, some stated that there should be a fundamental change at the university level to create a driver to be research-led and make changes with respect to criteria for promotions. Creating a research culture within each department is a common suggestion discovered in case studies. Many emphasised that awareness of research among students and access to institute’s research activities is important. An academic explained this; *“I do not think that RtoT transfer should always take place by researchers going into students’ classroom to teach. Students should be provided with access and awareness of current research through effective dissemination.”* Some further suggested to enhance innovative teaching through student-centred, problem-based learning mechanisms. An interesting suggestion was to practice ‘team teaching’ as part of this process. A person explained this team teaching concept, *“research-active staff members and research-inactive staff members team together to deliver undergraduate and postgraduate modules.”* All in all, increasing interaction among all members (be they academics, researchers, students or in some cases industry) is vital to create this cultural change. As part of this, interviewees mentioned to engage students in various research activities and create opportunities for students to disseminate their work at various forums, for example, a research conference. Another key suggestion was using research staff effectively in teaching activities by encouraging them to have a research profile with teaching duties. In fact, one respondent described indirect benefits of this; *“using research-active staff members in teaching is a selling point when it comes to undergraduate and postgraduate recruitments.”* For this to happen, some noted the importance training such staff to teach. Not only research staff, for every academics there is a need to create a balance between teaching and research. Hence, departmental support, in terms of resources allocation, changing policies, valuing teaching and changing recruitment policies, were also proposed. In addition to above suggestions, there were suggestions to overcome present barriers within departments. For example, to overcome the mismatch between staff research and curriculum, academics suggested collaborating with other departments who have research expertise on certain teaching modules. However, academics expressed their concerns, *“this is really difficult across faculties. In our case we can collaborate with ... department. But, since it is in another faculty this has become difficult.”* To overcome the problems with rigid module specifications, staff suggested to explicitly include research to teaching in the learning outcomes of module specifications. To overcome resource limitations, staff suggested introducing an equipment pooling mechanism so that resources can be effectively shared. To overcome research funding problems, there were suggestions to create business through new programmes based on cutting-edge research. Moreover, staff pointed that financial gains can be increased through academic enterprises and short programmes for undergraduates using research staff and postgraduates as teachers. The next section concludes key literature and case study findings while developing seven principles on research into teaching concept.

Conclusions and principles of research to teaching transfer

The importance of research knowledge transfer into teaching has been identified and debated by many authors with differing viewpoints ranging from the type of the discipline to types of departments. Key areas such as knowledge management and learning have been largely ignored in the search for effective strategies of research knowledge into teaching. This research had developed a generic understanding on research knowledge transfer into teaching through case studies across several disciplines such as built environment, information technology; sociology; nursing; geography; and, management. Finally, based on the literature findings and case study findings, this research proposes seven principles of research into teaching transfer.

First, both literature and case studies frequently identified the importance of research-informed teaching. Findings revealed that it is essential for academics to be research-active in order to deliver good quality teaching. If academics are research-active the transfer of research into teaching will happen naturally and informally. Thus, ***Principle One: Academics need to be effectively research-active so their teaching will be naturally research-informed.***

Second, the study identifies the importance of teaching approach in delivering research knowledge to students. Student-focused teaching is suggested by many pedagogical researchers as the most effective teaching method. In

addition, case study findings highlighted the importance of cultivating research skills such as critical thinking and analysis in students by research knowledge transfer. Therefore,

Principle Two: Academics need to consider effective teaching methods such as student-focused teaching; and, stimulate students' critical thinking by providing them with research training and knowledge.

Third, according to Boyer (1998), an academic should develop three types of scholarship: scholarship of discovery, integration and application. Hence, importance of balancing every academic's workload is emphasised in literature. Case study findings, further, revealed that academics, especially, experienced senior staff should engage in teaching at all levels in undergraduate and postgraduate courses. Thus,

Principle Three: Academic departments need to appropriately balance an academic's research and teaching workloads so that experienced research-active staff is engaged in teaching across all levels.

Fourth, even though, research-informed teaching is the key to transfer research into teaching, many academics agreed that there should be formal processes to aid natural mechanisms. Therefore,

Principle Four: Academic departments should consider formal processes to transfer research into teaching to stimulate research-informed teaching.

Fifth, academics pointed that it is important to maintain and evaluate the success of knowledge transfer mechanisms and how they enhance student-learning processes. Hence,

Principle Five: Following such a formal transfer process, academic departments should maintain and evaluate its success; especially student-learning followed by such a transfer.

Sixth, as case study findings revealed, formal mechanisms should not mislead its members to feel that it is a separate process. Both literature and case studies emphasised that departments should have a research to teaching culture where everyone is actively and effectively involved. Thus,

Principle Six: Research into teaching should not be a separate process; it should take place everywhere across a department so that it is built into the culture of that department with an appropriate balance between formal and informal processes.

Seventh, considering knowledge management concepts and views of academics, the transfer should go beyond academic departmental level to a wider community where everyone effectively share and disseminate research knowledge and good teaching practices. Therefore, finally,

Principle Seven: At a broader level, the university should create an academic community of practice where academic departments, disciplines and, a university as a whole or networks of professionals interact through face-to-face settings to disseminate research knowledge to a wider community.

These principles, as a whole, offer significant contributions to higher education departments in integrating research with their teaching activities.

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