

Transferring Research Knowledge into Teaching in The Built Environment

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Abstract

The link between Research and Teaching (R&T) has long been studied. Most research concludes by saying that there is no explicit or automatic relationship between these two activities. Separate quality assurance mechanisms and imbalanced funding lead to a trade-off between scholarly research and excellent teaching in higher education institutions. This problem could be addressed by exploring strategies to link research and teaching, to the benefit of each other. As identified in previous research this link is dependant on disciplines and few studies had attempted to explore the R&T link in the Built Environment (BE) discipline (for example, see Jenkins & Zetter, 2003). With diverse and multi-disciplinary subjects, the Built Environment is recognised as a fertile area to investigate this complex R&T relationship. The Research and Teaching link in this study is identified as a two-way process, for which the transfer of research into teaching (RtoT) is recognised as more important for research-based departments, where the emphasis is more on research and less on teaching activities. In this context, this study introduces guidelines for research-based departments in the BE on how to transfer research knowledge into teaching.

Keywords: Educational Research, Research, Teaching

Introductory Literature Review

The complex relationship between research and teaching (R&T) has been extensively studied. Previous research establishes the absence of an automatic link between R&T and the loosely coupled nature of these two activities (Jenkins & Zetter, 2003). By strengthening these loosely coupled activities, a productive relationship between staff research and teaching can be achieved. Recent studies have introduced several strategies to create this beneficial relationship as opposed to the problematic one that naturally exists (for example, see LINK: Good Practice resources Database, 2003; Fawcett et al, 2003; Cech, 2003).

Among previous research on the R&T link in the BE sector, the work of LINK (2003) offers significant contributions. This provides a generic model with guidelines on how to set-up the environment in linking R&T and a list of strategies that can be considered. Although this stands as a seminal work, it is limited in identifying appropriate strategies for research-based departments, for implementing and also maintaining such a link. The work also lacks due appreciation of the extant knowledge transfer and learning literature that helps in understanding the total process of research knowledge transfer into teaching. Mere transmission of research into teaching is insufficient as further activities should take place following such a transfer, such as student absorption and use (Davenport & Prusak, 1998). Hence, this study is different from earlier work, in that it aims to provide a guide in the light of knowledge transfer literature. This can be followed by research-based departments in the BE to improve student-learning processes.

The Case Study

The School of Construction & Property Management (SCPM) at the University of Salford was selected as the basis for the case study project. Members of academic staff, research staff and students were interviewed and a workshop was conducted to collect information on:

- The importance of the RtoT transfer in the BE
- Key issues and concepts
- Best practice examples
- Barriers and enablers
- Suggestions for improvement

The findings are as follows:

The importance of the R toT transfer

The importance of creating an explicit R&T link was affirmed by academic staff members at interviews. The benefits that they identified from such a link were gaining academic rigour, creating market differentiation, raising 'Royal Institution of Chartered Surveyors' (RICS) standards, keeping ahead of change and complying with the SCPM mission statement. Research staff and postgraduates were positive about linking research and teaching. They said the opportunity to present their work to a different audience could trigger new insights into their research, especially in the case of applied research. When questioned whether they like to teach on undergraduate programmes, they were happy with the idea provided that they were financially rewarded. An interesting view derived from staff interviews was the opportunity for financial gain through implementing academic enterprises and short programmes for undergraduates using research staff and postgraduates as teachers. Students were happy as they felt they were the immediate party who benefited from such a link. Their concerns over decreasing teaching commitments by staff due to research activities were apparent in the interviews, which further led to justification of the importance of managing staff research and teaching activities to suit student requirements.

Key issues and concepts on R toT transfer

The issue of 'what research knowledge is more important to be transferred to students' was a debating point. Some members said that it is the research learning process that is more important as opposed to research project findings. However, the majority view was that both types of knowledge were equally important. Another recurring issue was the need to address different learning styles. In order to achieve compatibility between curriculum and research activities, staff suggested using process mapping techniques to map the links that already existed within the school. In an industry which still favours old practices, the staff view was that students should be exposed to research outputs that are suitable for today's industry. This begs the issue of how appropriate high quality research findings would be at undergraduate levels. A final point that emerged from the interviews was that the R&T link is clearly different at postgraduate and undergraduate levels. At postgraduate level, the R&T link was already in place at a satisfactory level. At undergraduate level part-time students viewed the R&T link differently to full-time students. For the former students, such a link should clearly relate to their work prospects, where as for full-time students motivation can be created by the allocated credit value.

Best practices in R toT transfer

Examples considered to demonstrate the R&T link in Salford at undergraduate levels were project-based work such as GIP (group integrated project) and specialist modules such as the 'Construction Innovation' dissertation module introduced at level 3. The latter has unique characteristics such as providing students with knowledge on recent research projects in the BE sector. For example the students were presented with the findings of the Process Protocol outlined in this case study. In addition they are given small research assignments as part of this module. At postgraduate level, knowledge on the research learning process is taught to students systematically, starting from basic research skills and progressing to active research. Certain research within SCPM has generated new master level programmes, highlighting the effective R&T link at postgraduate level. Other best practice examples identified in the SCPM school review (2003) are workshops that present research outputs to undergraduates, active engagement of all members of professorial staff in teaching activities and new academic staff recruitments from research staff and PhD students.

Enablers and barriers for R toT transfer

In terms of barriers to creation of a link, conceptual barriers were identified such as the inherent mismatch between R&T, a mismatch between research and curriculum and working in an industry that changes slowly. From a staff perspective their personal goals and time constraints were highlighted. Also perceived as a barrier were students' lack of motivation; their focus on passing exams rather than in gaining actual knowledge and the expectation that modules be delivered through lecturers and handouts rather than self-learning. Superficial research, such as use of internet searches, was also adopted when students are allocated research activities. With regard to implementation barriers, there was also the fear and risk factor, such as students' ability to absorb research knowledge, wrongly designed programmes and key staff leaving amidst implementations. In contrast, enablers were the School's mission statement; research strength; positive attitude; recognised staff who could enrich the student experience; and the external linkages.

Suggestions to improve R toT transfer

The first consideration was how to overcome existing barriers. In order to overcome conceptual barriers, suggestions raised involved engaging staff more in teaching & learning activities; structuring the programme to highlight research; matching module learning outcomes to accommodate this new direction; and improving interaction with industry. To avoid staff concerns, suggestions such as creating business through new programmes and using

students in the data collection processes were made. With respect to student side barriers, the creation and cultural change was suggested through activities such as encouraging student self-learning activities by project based work; the provision of opportunities for student research on research forums; student research skill development from inception; engagement of students in various research activities within the school; and informing students of the value of research. Further suggestions to improve student research experiences included introducing a research showcase for students, an internal newsletter targeting undergraduates and packaging research to suit teaching (SCPM, 2003). An interesting idea that came from the interview process was the creation of a live interaction between undergraduates and postgraduates, so that both parties would benefit. With regard to implementation issues, departmental support in terms of resources (both physical and human), changing policies, valuing teaching to align both teaching and research activities and changing recruitment policies were proposed.

Based on the above findings, a model and guidelines were developed for how research-based departments can transfer research into teaching in the Built Environment sector.

Development of the Guidelines

As explained in the literature review, previous studies have introduced various strategies to create the R&T link. However, they do not explain how to formalise them. On a department basis, questions arise such as 'who should lead?' and 'who should be allocated to maintain the link?'. In Salford these questions led to the recommendation that a new staff position be assigned called 'R&T co-ordinator' with a 'R&T team'. By allocating human resources in this way, not only can the link be initiated but it can also be maintained while creating a learning environment. Therefore, the start-up activity of the proposed model (Fig 1) is the assignment of ownership and resources.

To enable RtoT transfer, three processes are identified as necessary. Firstly, it is important to review current research and teaching policies in creating the R&T link. An interesting idea that emerged from the primary data was to use process mapping to identify existing processes and those that need to be reviewed. The second is the review of research staff recruitments periodically in order to formally engage researchers in teaching duties. Thirdly, to improve the learning environment and to make effective use of IT facilities a 'R&T web page' is proposed. The purpose is to link students, researchers and academic staff in the department to strengthen relationships and create a shared space for interaction. This web site will create a forum to disseminate best practices and to initiate 'a research showcase', as mentioned in the primary survey.

A cultural change can be made within departments by introducing an 'innovation week' at each year of study. This 'innovation week' is introduced with various days for research-based activities. For example, in the first year of study, research awareness activities can be conducted as an introduction to the research institute (in the case of Salford) and staff research. In the second year, the week can be allocated to giving students knowledge about the research process, important findings from research projects and PhD research. In the third year, 'innovation week' can be used to engage students in research activities by asking them to conduct project-based research tasks and making presentations. The progressive nature of research activities from year to year enables the learning to be augmented incrementally. Innovation week will not just provide a research environment for students, but will also provide an enabling context for PhD-undergraduates interaction and industry-student interaction.

By identifying the importance of project-based learning and taking advantage of collaborative approaches in the BE discipline, an integrated project task is suggested as another RtoT transfer strategy. This is a cross-disciplinary group exercise that links one year to the next so enabling a learning cycle. This allows students to work collaboratively and gain active research experience.

Further, to provide not only new findings within the discipline, but also to give students first hand research knowledge, a separate 'research module' is proposed. For undergraduates this can be introduced at the final level along with their dissertation project. For postgraduates this could be introduced along with their research project. The module is designed to specifically select current research themes and improve student knowledge. The related coursework tasks can specifically focus on giving students research experience.

Both the literature review and primary data raised the importance of valuing teaching activities in research-based departments. Consequently, the recognition and reward of good RtoT practices are proposed.

Guidelines on transferring research into teaching

Guidelines 1: Assign ownership and resources to RtoT transfer

Guidelines 2: Review teaching and research policies periodically

Guidelines 3: Review staff recruitment policies periodically

Guidelines 4: Create and maintain an interactive forum through 'RtoT web page'

Guidelines 5: Facilitate RtoT culture through 'Innovation week'

Guidelines 6: Introduce 'Integrated project work' to provide research experience

Guidelines 7: Introduce 'Research module' to provide research knowledge

Guidelines 8: Introduce 'Short courses' on specific research areas

Guidelines 9: Recognise and reward RtoT best practices

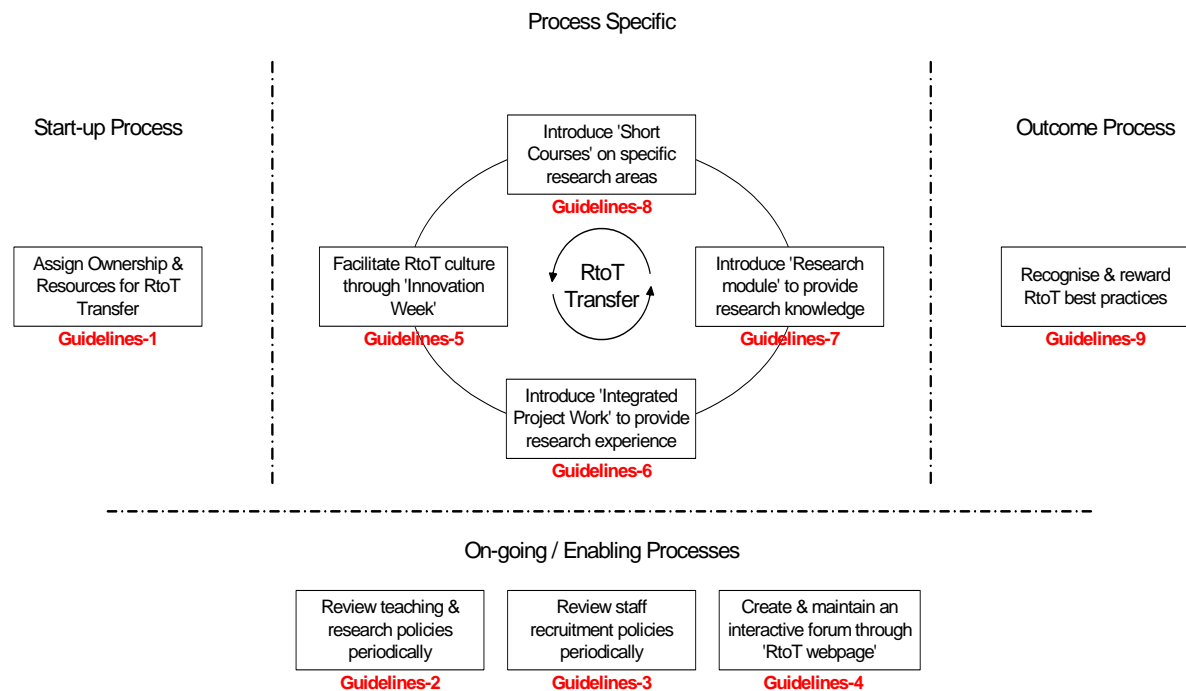


Figure 1: Framework to Transfer Research into Teaching in Research-based Departments

The above guidelines are integrated into an overall framework that divides the nine activities introduced by the guidelines into four elements: start-up, process-specific, on-going and outcome (see Figure 1). The start-up and outcome elements act as input and output activities in the RtoT transfer process. The most significant activities related to the RtoT transfer process are grouped under the process-specific element, where the real transformation takes place. The four activities under this are shown in a loop to represent the learning cycles within and in between the activities. Three activities, which should take place on a regular basis to enable the RtoT transfer process, are identified under an on-going element. The framework and guidelines provide a step-by-step guide for research-based departments in the Built Environment to transfer research into teaching. The guidelines have been validated through an internal workshop at the University of Salford.

Postscript

The next stage of this research is to develop implementation guidelines following the above findings. Thus, in phase 2 the guidelines developed above will be validated through a series of case studies. A further validation will be delivered by incorporating an action research element: implementing the guidelines in an undergraduate programme in a research-based department in the Built Environment.

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