A knowledge transfer perspective on research and teaching in higher education

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Abstract

Transferring new knowledge created through research into teaching is a primary task in any higher education institution. Recently in UK, this area has gained a wider attention with the growing emphasis on student learning approaches, quality assurance procedures and research funding mechanisms. 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 to manage research activities of university staff with their teaching duties. The research study on which this paper is based on, aims to develop a framework 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. The framework which is developed through an exploratory case study is validated through five further case studies in different disciplines. Thus, the final framework that is described in this paper can be considered by a higher education institution in creating a formal research to teaching transfer process.

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

1. Background

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 [1]. The qualitative studies, which have considered actor perspectives, for example, staff, student and researchers' views, have concluded that a symbiosis relationship exists between university staff research and teaching [2, 3]. Badley [4] synthesises different interpretations of R&T relationship into five types, 'an impending divorce'; 'a martial 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 martial 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 [4] further adds a 'really useful link' by seeing R&T in an interactive relationship.

According to Jenkins [2], 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 [5]. Recent studies address this issue and introduce different strategies to create a beneficial relationship rather than the problematic one that naturally exists.

As Jenkin and Zetter [5] argue, it is the academic departments who should develop this effective link depending on whether the department is teaching-biased or research-biased. Research-biased departments can create the link to benefit teaching from their research activities. Previous work shows that in research-biased departments, students are unaware of the high quality research discovered within these departments due to poor transfer mechanisms [6]. Thus, these departments can help students to appreciate the value of research within the department by creating a flow from research into teaching. Transferring research into teaching in research-biased departments is, therefore, seen as an important task that needs prompt attention.

Research has also found that the R&T link is dependent on different disciplines [7]. 'Linking Research & Teaching' [8] is a national project that has broadly studied the R&T link in a variety of disciplines such as geography, biosciences, law, health science and hospitality disciplines. An associated project, namely LINK: Good Practice Resources Database [9] explores the R&T link specifically in the built environment sector. In addition, the work of Fawcett et al [10] on nursing; and, the work of Cech [11] and Sears and Wood [12] on bioscience provide useful insights into this link. Planet [13] is a special issue that focuses on R&T link in geography, earth and environmental fields. However, these research studies fail to appreciate useful insights from the extant knowledge transfer and learning literature. By identifying this gap, an attempt is made to bring in knowledge management perspectives to this transfer process and develop a better understanding on the phenomenon.

2. Knowledge Transfer Perspective

Some pedagogical researchers have identified the importance of knowledge management perspectives on university research and teaching. For example, Jenkins [2] states that knowledge economy demands academics to be creative and gain ability to create; find; and, synthesise new knowledge. Scott [14] 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 [15], 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 [16] 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 [16] 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.

More insights can be gained by viewing research into teaching as a knowledge transfer process. According to Sexton and Barrett [17], knowledge transfer is viewed as the movement of knowledge via some channel from one individual or firm to another. In this context, this means movement of research knowledge (be it research findings, skills or processes) from researchers (be they academics, researchers or practitioners) to students (be they undergraduates or postgraduates) through teaching and other mediums such as seminars, workshops, conferences and project-based work.

Szulanski [18] identifies the difficulty of a knowledge transfer process in six ways. First, strength of relationship between the staff (staff research) and students influences the effectiveness of the transfer. Such relationships can be strengthened by creating positive attitudes among students toward staff research though awareness. Second, direct transfer of research findings to students is inappropriate as this can create ambiguity. In order to overcome this difficulty, research output of projects can be re-constructed to suit the student audience. Rowland [19] describes this as 'talk down to students'; that is devising a simple structure to deliver complex research knowledge to students. Third, absorptive capacity of students differs depending on their prior knowledge [20]. In fact, as Elton [21] argues, a positive R&T link depends on the nature of student' learning experience and the abilities of students (absorptive capacity). Thus, strategies need to take this into account. For example, at level one, students can be given an introduction to the basic research process and at a higher level they can access direct research experience. Fourth, reliability of research results is an important factor in transferring research knowledge into teaching. Lindsay et al [22] explains that research needs to be of interest, relevance and utility to students. This suggests that research results should be tested for their suitability and accuracy before transferring to students. Fifth, Szulanski [18] points out motivation as an influencing factor during knowledge transfer. Not only staff motivation but also student motivation is required in creating this R&T link. This can be created by a cultural change within a department as described in Section 3. Finally, since the transfer does not occur in a vacuum, contextual factors such as organisational context can also have an influence [23]. In sum, to transfer research into teaching effectively, these factors and their impacts need to be considered.

According to Davenport and Prusak [24], effective knowledge transfer does not involve mere transmission but also absorption and use following such a transmission. As such, initiating the R&T link in a department and feeding research knowledge into teaching is insufficient; the transfer needs to ensure that such knowledge is absorbed and used by students after a transmission. Huberman [25] confirms this when he claims that research data penetrates very slowly into the consciousness of the potential user, helped along by discussions and observations. According to him, the dissemination of research knowledge depends on its usefulness to the user and the absorptive capacity of the users. Accordingly, when students are

considered as the potential users of such a transfer process, their learning process followed by such a transfer is an essential consideration. As Griffiths [26] emphasises, for an effective transfer and learning, providing students with learning opportunities is insufficient; therefore, it is equally important to evaluate student learning. In fact, learning is the key driving force that links research and teaching [27, 28]. As such, in transferring research knowledge into teaching, different student learning styles need to be addressed.

The literature on learning styles can be grouped into four theories [29, 30, 31]. First, the 'field dependency' theory illustrates that learning can be influenced by the context that the students learn. Second, 'holistic versus sequential' learning theory describes that some students prefer visual approaches whereas some prefer verbal approaches to learning. Third, experiential learning theory (Kolb, 1984 cited in [29]) explains an individual's learning cycle in four aspects: activist, reflector, theorist and pragmatist. This role of experience in learning calls for activities such as project-based work that provide students with first-hand experience. Finally, based on 'surface versus deep' learning theory, it is the deep learning styles that should be encouraged in higher education institutions compared to surface learning. Griffiths [26] describes that inquiry-based learning as a powerful active learning tool, especially in the form of problem-based learning. Schon [32] describes that 'reflection on action' is also needed when students engage in active learning processes. On the whole, these theories on learning, suggest that not everyone can be taught in the same way and the teaching approach need to take these differences into account in evaluating student learning followed by such a knowledge transfer process.

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 and learning 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.

3. 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 [33], *"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 high research assessment rating as an exploratory case study. Aim of this exploratory phase was primarily to develop a framework to transfer research into teaching. Subsequently, departments that focus on disciplines such as information technology; sociology; nursing; geography; and, management were selected for detailed case studies. Aim of these case studies was to validate the already developed framework in the identified disciplines. The next section describes the development of the framework.

4. Framework Development

This section explains the development of a framework (see Figure 1) to create research to teaching transfer. The initial framework that was developed through the exploratory study was validated in detailed case study phase. This section describes the final generic framework that is validated by case study participants.

As case study findings identified, many academics favoured introducing formal strategies to facilitate RtoT transfer process. In formalising these strategies within a department, the questions as to 'who should lead?' and 'who should be allocated to maintain the link?' arise. These questions led to recommend assigning a new staff position called 'R&T co-ordinator' with 'R&T team'. By allocating human resources in this way, not only the link can be initiated but also it can be maintained. Therefore, the start-up activity of the framework is assignment of ownership and resources.

To enable RtoT transfer, three activities based on case study findings are identified as necessary. First activity is to review current research and teaching policies in creating the R&T link. The second activity is review of staff recruitment and development strategies at regular intervals; for example, research staff job descriptions can be changed to include teaching duties. Thirdly, to improve the learning environment and to make effective use of advanced technologies, creating and maintaining interactive forums, both physical and virtual, are proposed. The purpose here is to link students, researchers and the academic staff in the department in order to strengthen relationships and provide opportunities to disseminate good practices and research.

The specific RtoT transfer strategies are then considered by integrating various RtoT strategies; some of these were already in practice and some were suggested through case studies. Firstly, a cultural change within departments is proposed in terms of research and teaching practices. At the heart of this change, a week of activities (an 'innovation week') is introduced to offer research awareness and knowledge. This 'innovation week' is introduced at each year of study. For example, in the first year of study, 'innovation week' can be assigned for research awareness activities such as awareness of the research institute and staff research. Similarly, in the second year, this week can be used to give students knowledge on research such as research process, methods and findings. In the third year within this week, research skills can be cultivated in students by offering them research training and experience. This progressive introduction of research activities from lower levels to upper levels enable to feed-forward learning gained at each year. Thus, this innovation week will provide a research environment

among students. Furthermore, this week can be effectively utilised to provide opportunities to interact and share knowledge with different groups such as academics, researchers, postgraduate students and, also, relevant industry practitioners.

Most staff believed in project-based learning and problem solving as a path to transfer research to teaching. Thus, an integrated project task is introduced as another RtoT transfer strategy. This is a group exercise that enables students to work collaboratively and gain active research experience. Further, to provide not only new findings within the discipline, but also to give students with first hand research knowledge, separate module called 'research module' is proposed. For undergraduates this module can be introduced at the final level along with their dissertation project whereas for postgraduates this module can be introduced along with their research project. This module is aimed to specifically select current research themes and make students knowledgeable on these. Further the coursework tasks related to this module can specifically focus on giving students some research experience. Finally, based on suggestions offered by interviewees, another RtoT strategy introduced is implementing 'short courses' around staff research activities. Finally, as an outcome activity of this RtoT transfer process, recognising and rewarding RtoT good practices are proposed.

The above-discussed nine activities are integrated into an overall framework that represents 'RtoT transfer process'. These activities are divided into four elements: start-up, process-specific, on-going and outcome (See Figure 01). The start-up and outcome elements act as input and output activities in the RtoT transfer process. The most significant activities related to 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 on-going element. This framework is aimed at providing a step-by-step guide for academic departments to transfer its research into teaching.

In validating the framework within case study departments, significant comments were received which were incorporated into this final framework. Most departments agreed that this is a comprehensive framework that covers most of RtoT aspects. However, one case study department, which had strong informal research-based teaching practices, stated that it is important to evaluate the value of such a formal transfer mechanism where natural transfers exist. With respect to separate ownership, academics raised mixed views. Some stated that it will create bureaucracy while some pointed that people will start thinking that it is someone else job. Thus, it is important to emphasise that a separate ownership is assigned purely to facilitate the process and all academics need to effectively take part in RtoT transfer. Anyhow, many saw the importance of assigning an ownership, in particular, to manage administrative work in connection. The 'innovation week' received many positive comments; for example, in healthcare courses its academics expressed that this week would work well with their large student batches. Some mentioned that this week would nicely align with their induction programme in level one. Some academics pointed that this kind of activity needs to be assessed

to get good student participation. In recognising and valuing good practices, academics emphasised on valuing innovative teaching methods and staff personal development.

5. Conclusions

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 an understanding on research knowledge transfer into teaching through case studies across several disciplines.

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. Such formal mechanisms should not only be implemented in a department but also be properly maintained and evaluated for the success. Further, 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. Finally, 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.
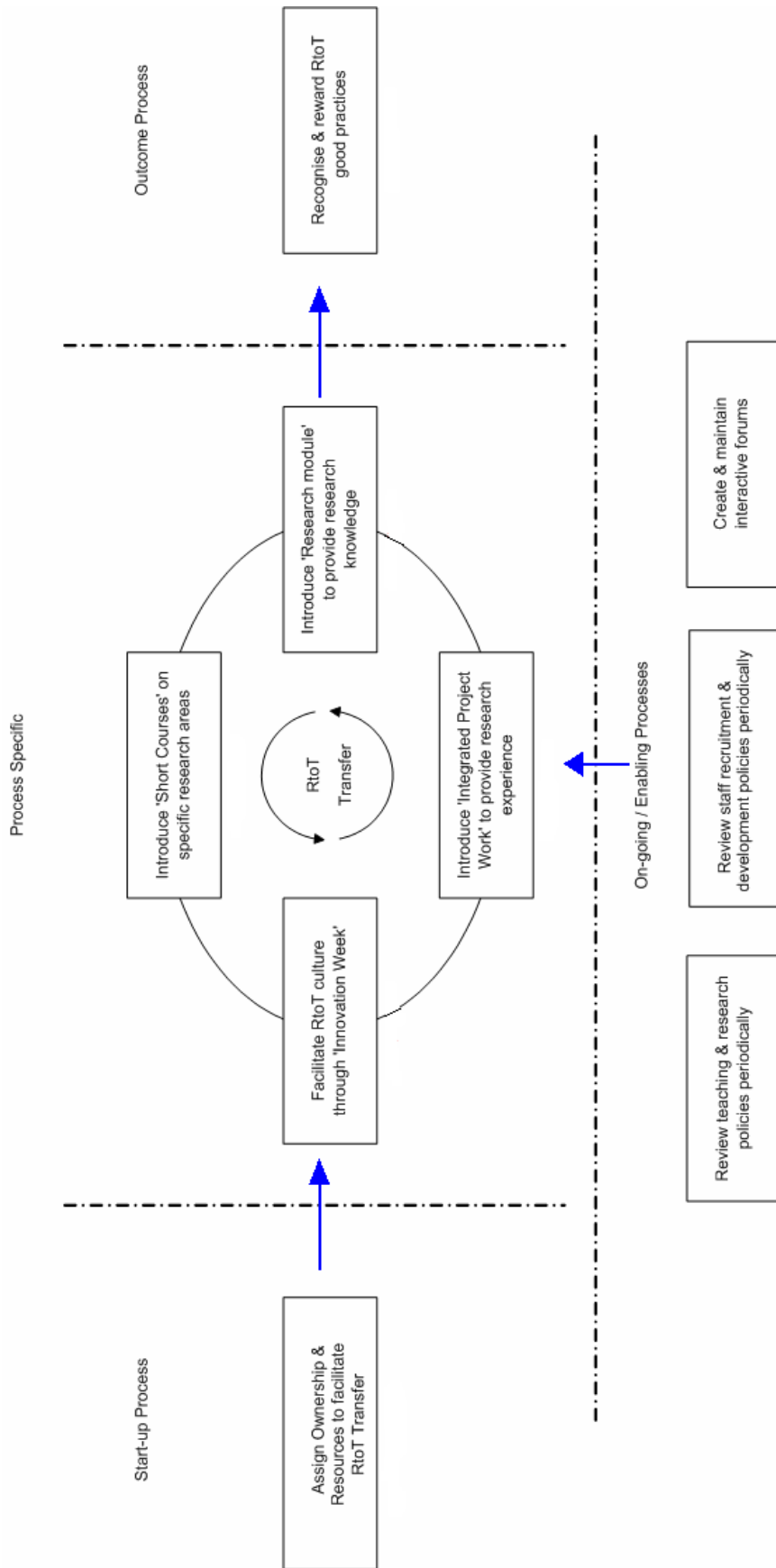
Figure 1: Framework to Transfer Research into Teaching in Higher Education Institutions

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