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Introduction

The nature of the relationship between research and teaching and the desirability of developing explicit links between research and teaching is the subject of ongoing debate in higher education (The Boyer Commission Report 1998; Brew 2003, 2006; Jenkins, Healey & Zetter 2007). Some researchers suggest a positive or complementary relationship between teaching and research (e.g. Neumann 1992; Braxton 1996; Sullivan 1996), while others report a separate or negative relationship (e.g. Barnett 1992). Negative arguments typically conceptualise teaching and research as separate activities that compete for an academic's time and resources (Ramsden & Moses 1992; Brew 2001). Positive relationships emphasise the qualities or attributes that active researchers may bring to their teaching. For example, Neumann (1992) identified beliefs about three levels of relationship that included 'tangible' benefits – where researchers provide students with advanced and up-to-date knowledge – and 'intangible' benefits – where researchers develop in students a critical and inquiring approach towards knowledge. Neumann's view was supported by Braxton (1996), who suggested that the roles of teaching and research are similar, in that they involve common values (e.g. rationality), and that they should be mutually reinforcing. However, little evidence has been found of a direct relationship between the quality of research and of teaching using quantitative performance measures (Hattie & Marsh 1996).

The continuing belief that both teaching and research are important elements of academic work has led a number of higher-education researchers to advocate the need for developing explicit links between research and teaching in university policies and practices (Jenkins & Zetter 2003; Brew 2003). However, Robertson & Bond (2001, 2005) found that disciplinary understanding of knowledge appears to influence whether academics believe that research can be integrated with undergraduate teaching. Teaching-research links in undergraduate teaching appear less likely in disciplines where knowledge tends to be viewed as hierarchical and cumulative (such as the physical sciences), than in those with more interpretive approaches. In disciplines that emphasise interpretive understanding, it is more common for students to be engaged in the construction of knowledge through discussion and inquiry. These views reflect a different understanding of research–led teaching as presenting research to students, and as engaging students in doing research or in constructing their own understandings of knowledge. Research may also be understood as meaning one's own disciplinary-based research, others' disciplinary-based research, or pedagogical research (Jenkins & Zetter 2003).

Documenting approaches to research-led education as case studies and examples has led to the development of descriptive frameworks to clarify educational purpose and outcomes (Jenkins, Healey & Zetter 2007). For example, Healey (2005a) builds on the work of Griffiths (2004) to develop a curriculum framework that reflects variations in (1) the emphasis on research from content to process, and (2) the approach to teaching from teacher- to student-focused, with students positioned respectively as audience or participants. Healey argues that students are likely to gain the greatest depth of learning from research when they themselves are engaged in doing research.

However, there has been little research into students' experiences of learning from research and how they develop research-related understanding and skills. A few studies have focused on students' experiences and perceptions of academic research at the departmental level (Volkwein & Carbone 1994) and university level (Kuh & Hu, 2001; Zamorski 2002; Robertson & Blackler 2006). Students were found to have mixed reactions to academic research because research made

their lecturers less available to them; however, many valued academic research and wanted it to be more visible to them (Zamorski 2002; Lindsay, Breen & Jenkins 2002; Robertson & Blackler 2006). Students' perceptions of the relevance of research to their learning were also influenced by disciplinary perspectives. Research was less valued by those with practical and applied orientations to careers and knowledge; in particular, postgraduate students tended less often to perceive research as salient to their own goals and motivations (Lindsay, Breen & Jenkins 2002).

This study investigates the design of research-led teaching approaches in an international business context and the impact on student learning and understanding of research. The first author has experimented with research-led education in his international business courses since 2005 by (1) drawing on his recent research as the basis for course content and assessment, and (2) involving students in research-based learning projects. His primary objectives have been to introduce students to recent theories and developments in the subject area and to develop their skills to search the literature and critically evaluate business problems and solutions. The current study developed as a collaboration with the second author, an educational researcher responsible for several initiatives to foster research-led education at the research-intensive university in which the courses are taught. Our collaboration enabled us to bring both theory and practice to these experiments, with our aim being to contribute to understanding of the design and impact of research-led education.

Context and approaches to research-led education

The study took place in Semester 1, 2006 and explored the use of two different approaches to research-led education in two courses in International Business at a research-intensive university. The two courses were International Business Management (a final-year undergraduate course with 144 students enrolled) and International Management (a graduate-level course with 17 students enrolled). Both courses included undergraduate and graduate students in the same classes, with a higher level of assessment requirements in the final examination for graduate students.

The two research-led education approaches involved (1) the lecturer's research providing the basis for an innovative case-study assessment activity, and (2) students conducting a research-based learning project in a practical business context. These approaches were intended to be relevant to a broad range of learning goals and student aspirations as future researchers and business practitioners.

The case-study assessment activity involved a negotiation simulation related to establishing a Chinese-Australian Pharmaceutical Joint Venture in Shanghai, China. The negotiation simulation was developed from the lecturer's recent research on multinational pharmaceutical firms' foreign direct investments in China. The case-study assessment represents an interesting example of research-led teaching: we used the lecturer's disciplinary research to create an experiential learning activity where students adapted his research findings to achieve a satisfactory outcome. In this approach students were participants in the research process as co-constructors of knowledge gained from their lecturer's research. Research-led teaching, where lecturers use their research findings as the basis for their teaching, is commonly characterised as being content- and transmission-focused, with students positioned as the audience for the research (Healey 2005a, Zamorski 2002).

In the case-study simulation, students were required to form two negotiation teams, one representing an Australian firm, the other a Chinese firm. The case scenario, objectives of negotiation for each team, instructions and marking criteria were distributed and explained in the class in the beginning of the semester. Students were given instructions to help them prepare, organise and conduct the negotiation. Specifically, the two teams were required to negotiate and reach an agreement on four different but interconnected terms for establishing an international joint venture: resource contribution (financial, technology and human resource) from each business partner; each partner's share of ownership; board of management structure and position allocation; and process and procedures of technology transfer. Students were advised to develop a number of strategies for the negotiation based on the case scenario, and were required to treat the simulation practice as a real negotiation process. The negotiation simulation was carried out during the last three weeks of the semester. Time was allocated for students to practice their negotiation and receive formative feedback from the lecturer before the final assessment. Students' performance was assessed by both the lecturer and their peers based on a number of specified criteria. These included preparation and organisation skills, procedure and process, effectiveness and problem solving skills, formality and professionalism, ability to stay within time limit and the negotiation results (achieving a win-win outcome). The performance against each criterion was measured as 'excellent', 'very good', 'good', 'satisfactory' or 'poor'.

The second approach was a research-based learning project in which students were required to analyse and evaluate research published in academic journals on a specific topic in international business and management. The lecturer introduced the project by describing 'research' and distinguishing between conceptual and empirical processes. Students were told that this project would involve conceptual research in which they would investigate the published literature to find out what is already known about a problem, and what isn't known, in order to identify the gaps. The research project was designed to extend students' experiences of research beyond many conventional essay assignments by their exploring the implications of the research, and identifying a theoretical gap to help them develop skills and a possible starting point for future study and independent research. This assessment was evaluated by the lecturer based on a set of criteria that included level of understanding of the issues and of research steps, inclusiveness of relevant literature, depth of analysis of appropriate literature, justification of theoretical gaps, evidence of independent thinking, logical development of arguments and academic rigour. The quality of the students' submissions was graded as 'high distinction', 'distinction', 'credit', 'pass' and 'fail' against the marking criteria.

Data collection

To investigate the influences of the two approaches to research-led education on students' learning, we designed a questionnaire with a series of open-ended questions. We believed that using a questionnaire was an effective approach for obtaining a range of students' views because it allowed us to survey a comparatively large sample of students, and they were familiar with questionnaires as a method for gathering their views about teaching and learning. We were concerned that students should feel confident to provide honest and accurate feedback to the lecturer, and hence the survey was sent out by e-mail after the courses were completed.

The questionnaire consisted of eight open-ended questions organised into two sections (see Appendix 1). The first focused on demographic information; the second and main section explored students' perceptions of the impact of the two approaches to research-led education on their understanding of research, learning experiences and learning outcomes. Students were asked to

give their views on a number of issues, including a definition of research, their knowledge of research in international business and management, their knowledge of the lecturer's research, the impacts of the lecturer's research on their learning, their awareness of research components in the course and the impacts on their learning.

The questionnaire was sent by email attachment to 80 students, which was approximately 50 percent of the total student population in the courses. The students selected were regular participants at the course sessions and so were expected to be able to provide an informed perspective about the teaching approaches used in the course, although we appreciate that this group is not representative of all students in the course (in particular those who chose not to participate regularly).

In total 27 students returned completed questionnaires, and 25 of these were useable after a careful check of the responses. This group represented 31 percent of those contacted for the study, and 15 percent of the entire student population in the courses. Of the 25 respondents, nine were graduate students, and 16 were undergraduates. Because the lecturer had used research-based learning projects in some of his previous courses, a small number of the students included in this study had attended these courses; four of the graduate students and two of the undergraduates had prior experiences of research-led education, which we would expect to inform the views they expressed about research in this study.

After the questionnaires were returned, we each read the responses a number of times to familiarise ourselves with the content in preparation for undertaking a content analysis as described by Coffey and Atkinson (1996). This analysis involved scanning the responses a number of times, then grouping them into data sets representing common meanings. Each data set then was condensed into categories for analysis and discussion. The results and discussion below explore the themes that emerged during this analysis and represent the range of students' views of their experiences and perceptions. While we are not generalising from these themes (given the small numbers of students involved), we think that the range of responses, indicating how students think about these issues, are of interest for others to reflect on and explore in their own setting.

Results and discussion

The findings focus on four major issues investigated in the survey: students' definitions of research; their knowledge of research in the subject area and their lecturer's research; their perceptions of the impact on their learning of the lecturer's incorporating his research in the course; and their perceptions of their learning from research.

Students' definitions of research

Students were asked, "How would you define research?" Students' definitions were grouped into the four categories below. We believed that each category represented a distinct understanding, and in general progressively added a new insight to the preceding definition.
Reading and collecting information;
Analysing and interpreting that information;
Testing or establishing theories;
Collecting own data and adding to knowledge.

These categories are described below, with examples of students' responses.

1. Reading and collecting information
Most students defined research as including reading and/or collecting information, but some students' definitions were limited to these processes. Some students demonstrated limited understanding or misconceptions about how searching the literature contributed to research, as illustrated below.

"[Research involves] Literature review, intensive reading about all relevant articles, understands and learns different ideas/ theories which are up-to-date. But we don't have to add our comment or ideas in it."

2. Analysing and interpreting information.
In this category students described a broader definition of research that included, but involved more than, collecting information, and included analysing and interpreting information and drawing conclusions.

"Research involves searching for information on a particular topic, usually collecting from a variety of sources, and compiling results to enable conclusions to be drawn."

3. Using theories to investigate and establish facts
Some students gave a more comprehensive definition of research at the conceptual level as being systematic and purposeful, with aims for investigating or establishing facts using theories.

"To my knowledge, the term research refers to the systematic investigation and examination of facts, whether they are recognised or proposed theories and premises, to effectively establish justified information on a particular subject matter; essentially, its fundamental aim is the investigation of truth."

4. Collecting own data and adding to knowledge
In a fourth category, students referred to empirical aspects of research in their definitions, for example by including "observations and experiments to seek new information" and "adding to what is already known". Only a small number of students included these ideas in their definitions, which may be due to the fact that most students were familiar only with the conceptual research exercise that they undertook in this course.

"Research is thoroughly studying a topic, seeking information through means such as surveys, experiments, in-country experiences and observations. Also studying current research to conduct further studies on topics."

Students' knowledge of research in the subject and of their lecturer's research

Students were asked "What do you know about research in this subject area?" and "What do you know about your lecturer's research?" For both questions many students provided vague or irrelevant statements, which indicated they had little or no knowledge about research in the subject. Where students did indicate some knowledge, we identified two categories of response:
Research topics and themes
Underlying relationships between topics and implications

These categories are described below, with examples of students' responses.

1. Research topics and themes
In general, students' responses in this category displayed only limited knowledge of research in the subject by listing a few topics and themes presented in the course. For example:

"I think research in international business currently focus[es] on the HRM and culture issues."

2. Underlying relationships between topics and their implications
Students who were able to identify a range of topics and themes from the course also usually identified underlying relationships between the topics, and described the purposes or implications of the research.

"International Business Management includes management and communication in intercultural settings, the effective structure and control systems in place for multi-national corporations, as well as the effective entry modes and strategies that such corporations employ in entering a foreign market. Such topics have been flooded with countless papers of research, due to its important impact in understanding ways to make international business and the process of globalisation much more effective."

Students' perceptions of the impact of their lecturer's research on their learning

Students described a number of different ways in which the lecturer's research had informed teaching and learning in the course. The key issues were the lecturer's use of practical examples to illustrate topics and theories, and the guidance and mentoring he provided for doing their research projects and using research methods.

We identified the following three categories of response to reflect the range of students' views about the impacts of the lecturer's research on their learning.

1. Providing first-hand, relevant and practical knowledge
Students described how the lecturer used his research in the classroom to illustrate course topics in relation to events and techniques, and to also guide students to relevant resources. Students valued having access to first-hand practical knowledge of topics that they were able to apply and practise in the real business world.

"The lecturer's research has been able to provide first-hand accounts in the classroom of actual business events, methods and techniques of conducting business in an international context. This has provided me and other students with a solid grounding in the importance of culture and the need to research the environment where business will be conducted in. I look forward to implementing some of the strategies in my own career."

"As the areas of teaching and research are highly related, the lecturer was able to direct students to specific sources for learning and research materials, significant research issues, the latest development of theories in the areas, and even specific significant research publications by certain authors in specific journals in regards to certain topics."

2. Stimulating students' trust in the lecturer and interest in the course

Students described the lecturer's enthusiasm, interest and knowledge in the subject matter as contributing to their own interest and trust in the lecturer and his teaching. This finding is frequently cited as one of the benefits of linking research and teaching (for example, Neumann 1994; Jenkins et al. 1998).

"… because the lecturer appears to be so enthusiastic and interested in the subject material...this excitement has rubbed off, further motivating me to become more interested. I know, from experience, that when a lecturer appears to be genuinely interested in what they are teaching it becomes quite clear and obvious to the rest of the class and so sets a good tone and mood for the entire semester. Furthermore, the lecturer is clearly very knowledgeable when it comes to international business; this invokes a sense of respect because I know that he knows what he is talking about, trust can be put in what is being said, and [he] isn't being contradicted elsewhere...."

"… the idea of having a practical negotiation simulation that was based on the lecturer's research was very useful. The lecturer was able to demonstrate thorough knowledge of the subject matter and show his interest in transferring that knowledge to the students. In addition, the lecturer was able to emphasise certain areas of the course to a much greater extent, which may have been due to his particular research and interest in those topics."

3. Modelling expert thinking
Students described the effectiveness of the negotiation simulation for developing their understanding of cross-cultural negotiations and how the lecturer was able to use the expertise gained from his research to guide them to a resolution.

"… the benefit of having a lecturer so heavily involved in research is that he is able to extend that theoretical knowledge to including realistic examples, allowing a more thorough grasp of the subject matter being taught. A perfect example of this is the lecturer's research on China-foreign joint ventures. The intricacies of cross-cultural negotiation cannot be taught effectively through simply reading and memorising information on it; a practical simulation is almost necessary. Using the lecturer's research on the negotiation processes of joint ventures in China has been pivotal to understanding such a topic. Using his guidance (stemming from his diverse research) on things like what the process should resemble, what is a likely consequence of certain actions, what strategies to adopt in negotiations, and what is the most beneficial way to achieving a win-win result has been the major reason why this course is so effective in delivering its subject matter".

Students' perceptions of their learning from research in the course

Interestingly, the majority of student responses to the survey referred to the research-based learning project, which involved students doing their own research of the literature. Most students did not refer specifically to the case-study simulation in their discussion of the impact of research on their learning. Students' responses to this question could be grouped into three key themes.

1. A new way of learning that is active and challenging
Most students reported that research was a new experience for them, and all students described doing research as challenging because it was more active and demanding than the passive learning approach familiar to them in lectures. Some students described an initial negative reaction, because they were not used to research-type tasks; however after their experience, they accepted and valued it as a new type of learning process.

"… this is the first subject I have done that involved a large research component. I was not used to this style of learning and was originally not interested in changing my learning technique. I feel that the research tasks took up a lot of time, but after completing all the assessments I can say that it was worth it. I think that this has better prepared me for tasks I may have to do in the workforce and furthermore, it provides a well-needed change in the teaching of university subjects...."

Others reported that doing research enabled them to personally get involved in exploring and contributing to knowledge development, which increased their enjoyment and ownership of the subject matter.

"The interesting aspect to incorporating research into the study material for a course is that it is able to incorporate the student into the learning process to an extent that traditional teaching methods do not. Research is able to involve the student, make them feel as if they are an integral part of learning, and that the work that they are conducting is actually contributing in some way or another to the subject matter being taught. Essentially, it instills into the students a fair degree of ownership to not only the actual subject matter being taught, but also the learning process as a whole. Having this feeling of a collective contributing to the subject matter ... makes learning at university so much more effective and enjoyable; it makes the students feel that their work is valued. This was the fundamental and key impact of research on my learning experiences and outcomes."

Only two students reported that the research-based learning did not have much impact on their learning. One gave the reason that it did not suit his learning style, although he did acknowledge that he completed the research assignment to a very high standard.

2. Learning to learn through research skills

As illustrated by the quotes below, students reported that they learned research skills during the course, which gave them new ways of understanding and approaching learning and of doing assignments that enriched their understanding of the subject matter.

"I personally found research skills more useful than just studying for a big final exam even though it is much harder. The best thing about the research is that because you need to read a vast amount of articles; at the end of the day, you will end up with better understanding of the issues...."

"It really changed my formal viewpoint toward the method and way of assignment writing. I used to think that writing assignments is as simple as finding some reference to support my idea and understanding toward the topic. It would be too subjective. But now I understand that doing research and writing research reports should be more objective. And only through massive reading to accumulate the knowledge can I understand and summarize the real viewpoint of the scholars."

3. In-depth and up-to-date knowledge

Students reported that the research-based learning project greatly enhanced their learning experience, as it provided them with more depth and scope in understanding the subject matter. Students contrasted this approach with reading textbooks, as they do in the majority of courses at university. Most textbooks take three to four years to be publicly available, and the research findings and theoretical development cited may be even more outdated. Therefore, even the latest version of a textbook, especially in rapidly developing disciplines like international business and management, may be considered outdated. Students reported that they valued the access to current knowledge and theories both from doing their own research and from the incorporation of the lecturer's research, which they could use to update outdated theories and knowledge.

"… a significant advantage of 'research-intensive' courses is the ability to browse through recent research, which continually adds and improves upon existing literature as opposed to outdated textbooks...; basically, these forms of assessment (research paper/literature review) suit my learning style better. I can still clearly remember all I have learnt from these classes, as I had to go and find the information for myself, it wasn't simply being regurgitated from a textbook."

Conclusion and implications

These findings suggest that students responded positively to both research-led education approaches. Overall, students valued the lecturer's approach to incorporating his research in teaching and learning activities because of his enthusiasm and having access to his up-to-date, relevant and practical knowledge of the international business world. These findings are supportive of many earlier studies about the tangible benefits of linking research and teaching (e.g. Neumann 1992; Braxton 1996; Sullivan 1996; Marsh & Hattie 2002).

However, as Healey (2005a) suggests, the greatest impacts on students' learning and understandings of research arose from their experiences of doing research in the research-based learning project. Almost all students in the study reported that doing research changed and enhanced their understandings of, and approaches to, university learning. However, most students found it to be very challenging, especially in the early stages. The majority of students appeared to have little prior experience of doing university-level research. In the consultation processes during the semester, the lecturer observed that many students did not understand the steps involved in doing research and experienced problems managing the research process, especially their time management. Many students also reported that they were 'locked' into the conventional argumentative essay type of assessment, and it was not easy for them to make a learning-style shift to this more "innovative" research-based learning approach of exploring practical implications and finding theoretical gaps.

Students' understanding of research and the research skills they reported also almost exclusively related to the conceptual research processes of searching and interpreting the literature that they undertook in the research-based learning project. Students were aware that the lecturer's research provided the basis for course topics, and they also experienced working with his research findings in the case-study simulation. Although this gave some students an understanding of his research topics and interests, they did not seem to experience this as being research. These findings suggest that students' understanding of research is influenced by the way in which research is presented to them and from their preconceptions. The research-based learning project was presented to students as an experience of doing research, and the research activities and processes they undertook may have been more congruent with their commonplace understandings of research as finding something out (Healey 2005b). The research activities in the case-study simulation involved students in applying knowledge derived from the lecturer's research to construct their own solutions to a problem. This activity required that students understand research to include extending, reinterpreting and/or transforming knowledge. This understanding of research is similar to understanding learning as conceptual change (Prosser & Trigwell 1999).

Meyer et al.'s 2005 study of postgraduate research students' conceptions of research identified five categories of conceptions, with similarities to those found in this study. Meyer et al.'s study found that students' conceptions of research ranged from a focus on gathering information, to an insightful process that involves gaining better or deeper understanding, and at the highest level, as

solving problems and answering questions. Students' definitions of research in our study tended to focus on the less-complex levels of collecting and interpreting information. This result is not surprising, as most of our students were undergraduates, and all had very limited experiences of research, unlike the students in Meyer et al.'s study, who were postgraduate research students. The conceptions of research described by Meyer et al. also suggest many similarities with the literature on students' conceptions of learning, as reported in Prosser and Trigwell (1999). Both show variations in conceptions that represent quantitative understandings of acquiring knowledge, such as gathering information, to qualitative understandings that involve gaining deeper understandings and new insights. By analogy, one would expect that students' conceptions of research, like their conceptions of learning, have implications on how they approach research-based teaching and learning activities and their learning outcomes. Helping students develop more complex conceptions of research that include constructing and transforming known knowledge will be relevant to them as learners and as future researchers.

The findings suggest implications for curriculum design and the implementation of research-led education. Different forms of research-led education have different educational purposes, and students' understanding of research will be informed and constrained by the approaches that they experience. For students to gain the most from linking research and teaching, teachers need to be explicit about their purposes. Research-based learning projects are very engaging for students and allow them to develop their research understandings and skills through the activities they undertake. Projects can be designed to focus on practical issues and contexts, and to develop skills and understandings that are relevant to both future researchers and practitioners. However, research is also very challenging for students and needs to be introduced in a way that builds their confidence and skills. These students showed limited awareness that research provided the basis for course topics and activities, although the lecturer tried to make explicit the connections with his own research. Developing students' conceptions of research so that they understand that research provides the basis for the production and evolution of disciplinary knowledge is an area for further investigation.

We have continued to explore and develop our approaches to research-led education by incorporating the implications of this study in ongoing course developments. An important change was to include an orientation discussion prior to the introduction of the research-based learning project. Students are now introduced to research-based learning, the reasons and benefits for adopting this approach and the process and steps involved in doing research. As a result, students have demonstrated much higher levels of confidence in conducting the research-based learning project. Students have also showed deeper interest in research and higher levels of engagement, which has had a very positive impact how we work with them on research projects. This has enabled students to be more involved with the lecturer's research, and we now include them in discussions about challenges and issues in his current research-related activities and projects. Our ongoing developments aspire to create a scholarly learning community where students are progressively engaged as participants in research activities, as envisaged by The Boyer Commission (1998) and Brew (2006, 2003) as an ideal model for university learning.

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Appendix 1: Survey instrument

Survey of Teaching and Learning

Background:

What is your enrolment status? <e.g. International student or Australian student>

Please indicate the degree program you are enrolled in?

Aspects of Teaching & Learning Approaches

How would you define research? What do you know about research in this subject/course area?

4. What do you know about your lecturer's research?

5. In what ways and to what extent has the lecturer's research impacted on your learning experience and outcome in this course and, if applicable, other courses taught by this lecturer?

6. Did you experience research as part of your learning in this course? Please give examples. What did you learn/ gain from your experiences of research in the course?

7. In which way and to what extent this research component has impacted on your learning experience and outcome?

8. Your recommendation