SAGE Research Methods Case Education Submission for Consideration

Case Title

Research Informed Teaching – A Mixed Methods Approach to Assessing Perception and Practice Within a Higher Education Setting

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**Dr. Curtis Ziniel** is a lecturer in research methods. Originally from North Dakota in the United States, he earned his PhD from the University of California, Riverside in 2009. His previous experience includes a 15 month Visiting Fellowship at Harvard University and a one year Visiting Assistant Professorship at the University of Oregon. He started teaching at Hope University in 2010. His teaching experience includes lecturing in research methods, communication, politics, education, and business. He is a Fellow of the Higher Education Academy (FHEA). His teaching at the Liverpool Hope Business School focuses on research methods for both undergraduates and postgraduates.

**Dr. Asad Ghalib** earned a Doctorate in Development Policy and Management and a Masters in Management from the Global Development Institute (GDI), School of Environment, Education and Development, University of Manchester. He has been associated with a number of institutes and organisations around the world in the academic, development, research, not-for-profit, financial and banking services industry. He holds Fellowships of the Higher Education Academy (FHEA) and the Royal Society of Arts (FRSA) and is a member of the European Survey Research Association (ESRA), Mixed Methods International Research Association (MMIRA) and Development Studies Association (DSA).

Abstract

Research Informed Teaching is becoming increasingly popular and ‘fashionable’ these days, given the rise of a number of pedagogical methods and techniques within the higher education sector.

An exploratory sequential mixed-methods design was used to capture academics’ feedback and assess the effectiveness and value of Research Informed Teaching (RIT) for both students and teachers at a new mid-sized English university. The first phase comprised detailed face-to-face interviews of academic staff across all faculties at the university. The qualitative data thus gathered was analysed and used to draw up a set of questions for designing and imparting a questionnaire-based semi-structured survey. The survey was administered online across the university and responses were analysed. Finally, inferences were drawn by analysing and mixing data from both phases.

Study findings revealed how lecturers implemented RIT into their own teaching provision and how it was highly idiosyncratic; determined by their individual teaching subjects, their own teaching styles, and their own independent definitions of RIT.  Moreover, we found a statistically significant positive correlation between tutors’ research outputs and their tendency to use their own work towards RIT. Another observation was that science tutors’ teaching content contained a significantly greater amount of their own research as compared to non-science tutors.

Learning Outcomes

By the end of this case students should be able to

* appreciate the use of both quantitative and qualitative methods to arrive at and form a more holistic judgement and understanding of the study question(s);
* have a good understanding of when and why mixed methods are used;
* understand the limitations faced by using either quantitative or qualitative methods on their own;
* gain a basic understanding of mixed methods and practical knowledge of how the *exploratory sequential mixed methods design* is applied

Case Study

**Project Overview and Context: Research Informed Teaching**

A number of past debates have argued for developing clear links between research and teaching within the higher education sector. Naturally, this has led to academics debating the nature and extent of this relationship. Those that support the use of research for teaching within a specific field maintain that there is a positive relationship between teaching and research as both are complementary. On the other hand, those who oppose the concept opine that these are separate activities that compete for an academic’s time and resources (Fuming and Roberts, 2011). Neumann (1992) identifies the ‘tangible’ and ‘intangible’ benefits of research informed teaching. The tangible benefits are those where researchers provide students with advanced and up-to-date knowledge, which is based on relevant studies that complement what was delivered in class. The research could be their own or derived from others’ work.

Intangible benefits, on the other hand are those where researchers allude to pertinent studies and thus aid in developing a critical and inquiring approach towards seeking knowledge.

The concept has been referred in literature by a variety of terms: ‘inquiry-based learning’, ‘teaching-research nexus’, ‘research focused’, ‘research oriented’, ‘research-informed’, ‘research-led’, ‘research-based’ and ‘practice-based’ learning and teaching, etc., to name a few. The section that follows explores RIT within a higher education setting.

**Research Informed Teaching within Higher Education**

The rise of internationalization, globalization and competition have led higher education institutions to rethink the way they deliver course content to their students. In a detailed report, Healey and Jenkins (2009) conclude that undergraduate students in all higher education institutions should experience learning through, and about, research and inquiry. The authors argue that students, particularly at the undergraduate level, should be taught and assessed in a way that enables them to come as close as possible to the experience of academic staff carrying out research based on their own disciplines. The authors identify four main ways of engaging undergraduates with research and inquiry:

* ***research-led:*** learning about current research in the discipline;
* ***research-oriented:*** developing research skills and techniques;
* ***research-based:*** undertaking research and inquiry;
* ***research-tutored:*** engaging in research discussions.

The model, shown in Figure 1, comprises two axes. The first (y-axis) classifies learning and teaching along the extent to which students are treated as participants and as the audience. The second (x-axis) classifies on the basis of emphasis: whether greater emphasis is placed on research content or research processes and problems.



***Figure 1: The nature of undergraduate research and inquiry (Healey and Jenkins, 2009)***

**Research Informed Teaching at the University: a case study**

This case study investigates RIT and its implementation within a single, mid-sized, new (post-1992), English university (henceforth University). The University’s learning and teaching policies place special emphasis on teaching based on actual research. While the concept may vary across disciplines, the University describes it broadly as a practice in which the curriculum and associated assessments “allow students to produce work that is close to the research processes within that discipline. This means that students begin to think like a ‘geographer’ or a ‘scientist’ and understand how knowledge is constructed and disseminated in that discipline. This may involve going on a field trip to study the local sand dunes or developing laboratory skills in measuring levels of physical fitness, for example” (taken from University policy documents).

With this practice, the University aims to encourage its students to graduate as well-rounded and employable global citizens who can take their place in the 21st century with ‘an appropriate knowledge base, a deep understanding of its limitations as well as its potential, and a desire to apply and add to new knowledge’ (taken from University policy documents).

The University has set out a Learning, Teaching and Assessment Strategy based on ten principles which encompass a wide range of dimensions pertaining to learning and teaching and provides the ‘vision’ for Learning and Teaching at the University. Out of these ten, the fourth principle, *‘a curriculum informed and influenced by current research’*, is dedicated exclusively to RIT. As shown in Box 1, this principle comprises eight underpinning expectations from staff and students.

**Underpinning expectations from staff and students:**

* Teaching will be research informed and influenced by relevant and up-to-date research in the tutor's respective fields;
* All students and tutors should be part of a discipline specific, research inspired, academic community of practice, dedicated to sharing interests and developing knowledge;
* Students will recognise that academic study need not be directly linked to employment, but that academic study can be used to compete in a constantly evolving job market;
* Students and tutors will aim to understand the complex relationship between knowledge, research and employment;
* Students will be supported in their transition into the academic environment and on towards postgraduate study;
* Students and staff will conduct all of their work ethically, adhering to university guidelines;
* Both students and tutors will aim to contribute to the University academic community;
* Students will be empowered to contribute to social change and staff will support them to be change agents.

**Box 1: Underpinning expectations from staff and students of Principle 4 of the ten principles of learning teaching and assessment at the University (taken from policy documents)**

**Research Practicalities: carrying out a survey to assess Research Informed Teaching amongst faculty at the University**

As mentioned earlier in the introduction, RIT is becoming an increasingly common practice within the higher education sector. As outlined in the preceding section, the University places great emphasis on it and has laid out a strategy that outlines a set of expectations from both staff and students. Given the diversity of tutors’ experience, fields of interest, range of published work and areas of expertise, we thought it would be interesting and thought-provoking to conduct a study to assess a range of dimensions and aspects relating to how faculty members perceive RIT to be and how they implement it in their teaching practice.

The study was launched by conducting a series of in-depth face-to-face qualitative interviews with teaching staff across all faculties at the University. We chose to begin with qualitative interviews because of the relatively new push toward RIT at our case University. The interviews would allow more detailed data gathering to provide the information and context necessary to further develop our lines of inquiry and thus narrow our focus for the quantitative element of our research.

Analysing the qualitative data led us to design a semi-structured questionnaire that captured aspects such as the length of teaching experience, how active staff were in terms of carrying out their discipline-specific research, how many research outputs they have had in the last two years, what they believed should be the primary emphasis of research informed teaching, what an ideal definition of RIT should include, what they believed to be included in the University’s definition of RIT, if they felt that the University should be more clear in its expectations of RIT and what percentage of their teaching material is informed by their own original research.

The survey instrument was administered in October 2016 in the form of an online questionnaire, a link to which was emailed to all faculty members. The questionnaire guaranteed complete confidentiality and anonymity as no personal identifying details were captured. The quantitative data collected was input to a dataset and was subsequently analysed across a number of dimensions.

**Research Design**

The study was designed and conducted to obtain a holistic view of RIT across a number of dimensions. We wanted to explore how the faculty perceived RIT, how they implemented it in their pedagogical practice, and their opinions of the process as a whole. Given the wide-ranging objectives of our study, we felt that a mixed-methods approach would be most suitable.

This approach to inquiry investigates a research problem from multiple dimensions by combining, contrasting, and analysing both qualitative and quantitative forms of data. John Creswell and Vicky Plano Clark (2011) assert that this method resides in the *‘middle of the continuum’* because it incorporates elements of both qualitative and quantitative approaches. They argue that using mixed methods offers a better and more holistic understanding of a research problem as the method offsets the weaknesses of using just one approach on its own.

Our study used in-depth face-to-face interviews to capture qualitative data, while a semi-structured questionnaire was used as the instrument to capture the quantitative aspect

Creswell (2015) proposes three basic mixed-methods designs: parallel convergent, explanatory sequential and exploratory sequential designs. In the parallel convergent design, both quantitative and qualitative data is first collected separately. Both types of data are then analysed independently. Once this is done, analyses from both types of data are mixed to interpret findings. In the other two designs, only one type of data is collected and analysed first, followed by the other. The *explanatory sequential design*, for instance, examines a problem by initially collecting and analysing quantitative data in the first phase. Once this is done, the second phase is used to gather qualitative data, based on the results obtained from the first (quantitative) phase. The final interpretation is done by mixing data and analyses from both phases.

For the purposes of carrying out this research, we based our design on the third type, the *‘Exploratory Sequential Design’*. According to Creswell and Plano Clark (2011 p. 71) ‘the exploratory design begins with and prioritizes the collection and analysis of qualitative data in the first phase. Building from the exploratory results, the researcher conducts a second, quantitative phase to test or generalize the initial findings. The researcher then interprets how the quantitative results build on the initial qualitative results’

**Data collection: Qualitative interviews and semi-structured online survey**

The study was carried out over three distinct phases, the steps of which have been elaborated below and illustrated in Exhibit 2:

***The first phase:***

1. *Face-to-face qualitative interviews and their subsequent analyses*

The first phase comprised 12 interviews that were held with staff across various faculties within the University. These were held in person and questions were prepared in a semi-structured manner. The prepared questions investigated a number of aspects related to RIT and the faculty members’ perceptions of the concept, what they felt about it, and how and to what extent they used it in their teaching practice at the University. These were all recorded and subsequently transcribed to analyse and extract themes.

1. *Determining what to explore further through quantitative means*

The findings thus obtained were used to determine and identify the various aspects and themes that needed further investigation and exploration in the second quantitative phase of the study.

***The second phase:***

1. *Collection and analyses of quantitative data captured through a semi-structured online survey*

The second phase comprised designing a survey instrument that was administered online. This survey comprised a number of questions that were developed from analysis and interpretation of qualitative data obtained from the first phase.

1. *Analyses and interpretation of quantitative data*

Data obtained from running the survey were used to test and generalise the findings that were obtained from the earlier qualitative phase.

***The third phase:***

1. *Interpretation of quantitative results built on qualitative results*

In the third and final phase, we interpreted the quantitative results and built them upon earlier qualitative findings (obtained from phase one). This phase provided us an insight into whether the qualitative findings from the first (smaller) phase could possibly be generalised to a larger survey sample (conducted in the second phase).

All three phases and the steps involved have been illustrated in Figure 2 below:

**QUALITATIVE data collection**

**QUALITATIVE data analysis**

**First Phase**

**QUANTITATIVE Instrument Design and data collection**

**QUANTITATIVE data analysis**

**Second Phase**

**Third Phase**

**Figure 2: Phases that constitute our Exploratory Sequential Mixed Methods Design**

**Study findings and analysis**

Our initial direction for this research focused on the manner in which colleagues implemented Research Informed Teaching into their own teaching.  In the first, qualitative phase, we carried out 12 interviews across the humanities, sciences, and social sciences. These in-depth interviews revealed 'how' lecturers implemented RIT into their own teaching provision. We found that implementation of RIT was highly idiosyncratic; determined by staff members’ individual taught subject areas, their unique teaching styles, and their own independent definitions of RIT.  This can be seen in the example answers provided below.

*“I have a third year seminar component for students, which is very specifically my current book project… so there is a very direct link into my research there. So I will run draft papers past students and get them to comment on those, critique them and so on. That’s at the top level of it. But even for first years, you can use your research activity to make your work come alive.”* (Humanities tutor with 28 years of experience).

*“It’s a bit different for me because I have an applied background. So I probably use a lot more applied research rather than published research. It’s work I’ve done that’s not necessarily published but it’s applied practice. So more giving the students applied examples and how more widely published research can be applied in different situations and then giving examples, or having the students do experiments”* (Science tutor with 2 years’ experience).

*“My research is related to environmental economics and it is not covered at undergraduate level. At postgraduate level I can include a couple of hours of lecture about it.”* (Social science tutor with 7 years’ experience).

Even though we completed detailed interviews, we could not identify any specific patterns or relationships toward the creation of new knowledge about how RIT was or should be developed by tutors.  Instead we discovered a wide variety of definitions of RIT itself, centred around two primary definitions.  Lecturers believed that the emphasis of RIT should be placed on either teaching one's own research or having teaching content that was steeped in the most recent research in the field.  Both are important for research informed teaching, but the distribution of opinions on how much one view should be taken ahead of the other varied significantly within our sample of interview participants.

*“I have a feeling when people talk about research informed teaching, they are talking about people or departments teaching research that is being produced by that department or those individuals which is kind of a narrower understanding. I feel like for me, all teaching is research informed because what we teach is based on decades of research.”* (Social science tutor with 3 years of experience).

*“I know some people define it as general research, not their own… and I like that idea, but I think that’s something that we need to do anyway. We always need to teach in a way that has been informed by research that has been conducted by someone or other. But I think, ideally, much more of that should be informed by our own research because then we can really go into the intricacies, not just what is written in an article, but a lot of the things the students need to learn in order to become researchers themselves; things that have gone wrong that don’t get mentioned in articles, or things that were difficult and how to handle them, connections between different issues that often don’t become apparent in the write up of a study.”* (Social science tutor with 5 years of experience).

These findings enabled us to move into the second phase of the study. This was the quantitative phase where we investigated aspects like if the field of study, length of employment, or research activity have an impact on views of RIT; how people define RIT for themselves. To explore these relationships, we conducted a survey across the University that garnered 74 responses. The statistical data provided by this survey allowed a more thorough examination into some of the determinants of opinions about RIT.

Some general descriptors of respondents by general research area are included in Figure 3 (the general areas used are roughly equivalent to how many universities define their faculties). Overall, respondents were quite similar when compared by teaching experience, research activity, and implementation of research into teaching when compared across faculties. These comparisons are quite consistent except for lecturers in the Sciences implementing their own research into their teaching. A t-test for difference of means confirms that the difference between Science respondents and those from the other two areas is statistically significant at p=0.048 (two-tailed test). This result suggests that there may be different norms or expectations in the Sciences regarding the integration of the tutor’s own research into their teaching materials, especially when there is no discernible difference in the level of research activity (amount of research being conducted) between faculty areas.

From a methodological perspective, we are confident in the construct validity of our findings because our survey purposefully asked questions examining similar or the same concepts but from different perspectives. For example, we asked respondents to rate their personal research activity on a 5-point Likert type scale from very active to not at all active. We also asked respondents to list the number of research outputs (conference papers, research publications, etc.) that they produced in the last two years. These questions are very similar and, as expected, are highly correlated. The Pearson’s correlation coefficient for the two variables was 0.43 with a p-value of 0.00016. The variables are not equal, but are highly correlated and demonstrate very similar relationships with the other variables in our survey. We did not construct overlapping questions for all of the constructs investigated in our survey, but we purposefully constructed multiple questions for the more conceptually abstract elements of our investigation, especially the aspects of how tutors defined RIT (i.e. all aspects, the most important aspects, definition used by their university).

Now that we have examined some of the characteristics of our survey, we will consider the primary investigation of our study: how tutors conceptualise RIT. The survey results showed that most respondents (66%), when asked their opinion on the primary emphasis of RIT, believed that teaching should be underpinned by the most current research in the field, not necessarily research conducted by the lecturer. Only 20% of respondents chose lecturers implementing their own research into their teaching as the primary focus of RIT. The rest of respondents chose other views such as researching one’s own teaching, students’ education including research skills, or indecision between answers. While teaching underpinned by general research was the most popular answer when given only one choice, when respondents were allowed to choose multiple elements for their ideal definition of RIT they were quite inclusive of other views. Figure 4 shows that a majority of respondents agreed that current research, the lecturer’s research, and student research skills all deserved a place within the RIT concept.

Digging deeper into these findings, we thought it would be interesting to examine why some tutors might choose one definition of RIT over another. As seen above, the focus on teaching one’s own research was less popular that the view of all teaching being underpinned by some research. So we suspected that an individual’s own research focus or ambitions might play a role here. If someone is more research active, they may have a greater desire to disseminate that research to students, and a greater belief in the importance of students receiving that content. Using the survey results, we examined the correlation between research outputs in the last two years and listing teaching one’s own research as a priority for RIT. Figure 5 graphs the relationship as estimated using a logistic regression. When outputs over the past two years go up, the expected probability of the respondent emphasizing teaching their own research as part of RIT also rises. This is a statistically significant finding that encourages tutors to scrutinize how we approach our own teaching and how we come to choose some content over others.

We ran another model examining reasons why tutors may decide to implement more or less of their own research into their teaching content. For this investigation, we used a least squares regression to model the influence of research area (Arts/Humanities, Social Science, or Science) and research activity (as measured by counts of research outputs in the last two years) on use of personal research in teaching content. The results of this analysis can be found in Table 1. Both independent variables produced statistically significant results. On average, science tutors’ teaching content will contain about 14% more of their own research than non-science tutors. This difference can be seen visually in Figure 4. These findings are consistent with the logistic regression results. As tutors become more focused on their research, definitions of RIT trend more toward inclusion of one’s own research rather than simply teaching content supported by the most current research in the field.

Another interesting finding was that years spent teaching was highly correlated with years working at the University. However, while more years spent teaching correlated with a greater confidence in understanding the University’s definition of RIT, more years at the University itself (not just teaching experience) correlated with less confidence in the University’s definition of RIT. This may have occurred because of the nature of employment and the topicality of RIT. RIT has seen a recent surge in emphasis within University teaching. This new popularity means greater implementation, but it may be newer employees who receive greater clarity about University policies and directions, as the newest employees will have gone through relevant induction programmes and will not have to endure any confusion over changes from previous policies or procedures.

**Figure 5. Expected probability of a lecturer emphasizing teaching their own research as the primary element of RIT as the lecturer’s research outputs change from zero to twenty.**

**Logistic regression results.**

Table 1. The influence of Research Field and Research Activity on the Percentage of Teaching Content containing the Tutor’s own Research. Least Squares Regression Results.

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Variable Coefficient Stand. Err. P Value

Research Activity 1.966 0.568 0.001 \*\*

Science Tutors 14.996 7.038 0.037 \*

Intercept 13.402 4.624 0.005 \*\*

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\* P Value < 0.05

\*\* P Value < 0.01

**Figure 4. Expected personal research in teaching content for science and other tutors as research outputs range from zero to twenty. Least Squares Regression results.**

**Conclusions**

Given the emphasis that the University places on research informed teaching and also current trends in the sector, this study was aimed at exploring how teaching staff from different faculties perceived RIT and how they implemented it into their pedagogical practice. An exploratory mixed methods design was used for this study, with the findings from qualitative interviews leading to the construction and design of a semi-structured questionnaire to collect quantitative data. Both types of data were used to arrive at a number of findings that have been discussed at length in the preceding section.

As argued by Creswell and Plano Clark (2011), the mixed methods approach bears strengths which are greater than the individual methods (qualitative and quantitative) being applied on their own. This is because using both types of data provides a more comprehensive and rigorous set of findings that can enable us to better understand a research problem. As we have seen from the discussion section above, using merely one type of data (either one of them) would have led to more limited insight into the study area, whereas collecting and analysing data in a certain sequence offers a more robust and comprehensive understanding of the research problem.

**Exercises and Discussion Questions**

1. Which research method(s) did we use for this study, and why do you think we selected them for this particular research?

Out of the three mixed methods research designs proposed by Creswell and Plano Clark, we used the *exploratory sequential mixed methods design*. Given the nature of the research questions to which we sought answers, why do you think the other two methods were not appropriate?

1. Given that we were researching a topic in which the participants came from different faculties and a number of disciplines, with different levels and periods of experience, what do you think would have been the consequences of using either qualitative or quantitative methods alone to collect data?
2. The case mentions a specific mixed-method design. Why do you think we considered it to be the most appropriate for this study?

The case provides brief explanations to three mixed methods designs. Discuss how (and why) any or a combination of these designs fit with your current or future research. While you discuss this, also consider what opportunities are offered by the mixed methods approach as opposed to using either qualitative or quantitative methods exclusively.

1. We have mentioned the benefits of using mixed methods. Can you think of any disadvantages that this method might have? You can use any study as an example to illustrate your point.

Further Readings

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