

UHI Research Database pdf download summary

Academics' conceptions of and approaches to research-teaching linkages: Challenges for realising the curriculum as praxis

Rayner, Michael; Smyth, Keith; Fotheringham, Heather

Published in:

Journal of Perspectives in Applied Academic Practice

Publication date:

2020

The re-use license for this item is:

Unspecified

The Document Version you have downloaded here is:

Peer reviewed version

The final published version is available direct from the publisher website at:
[10.14297/jpaap.v8i2.461](https://doi.org/10.14297/jpaap.v8i2.461)

[Link to author version on UHI Research Database](#)

Citation for published version (APA):

Rayner, M., Smyth, K., & Fotheringham, H. (2020). Academics' conceptions of and approaches to research-teaching linkages: Challenges for realising the curriculum as praxis. *Journal of Perspectives in Applied Academic Practice*, 8(2), 25-38. <https://doi.org/10.14297/jpaap.v8i2.461>

General rights

Copyright and moral rights for the publications made accessible in the UHI Research Database are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights:

- 1) Users may download and print one copy of any publication from the UHI Research Database for the purpose of private study or research.
- 2) You may not further distribute the material or use it for any profit-making activity or commercial gain
- 3) You may freely distribute the URL identifying the publication in the UHI Research Database

Take down policy

If you believe that this document breaches copyright please contact us at RO@uhi.ac.uk providing details; we will remove access to the work immediately and investigate your claim.



Academics' conceptions of and approaches to research-teaching linkages: Challenges for realising the curriculum as praxis

Michael Rayner, Keith Smyth and Heather Fotheringham, University of the Highlands and Islands

ABSTRACT

In this paper, we seek to provide a rich exploration of the conceptions of and approaches to research-teaching linkages (RTL) that are held and undertaken by scholars, researchers and academics within Higher Education (HE). The work we report has been undertaken as part of a longitudinal institutional project to broaden and deepen engagement with RTL in a geographically distributed university that sits within a particular social and economic context. The project has a primary focus on exploring creative new ways to embed RTL principles and practices across a broad range of subject areas, within formal learning and teaching, and curricula, in such a way that the intellectual work our students undertake and produce has a direct value to the needs of the wider communities the university serves.

Within this paper, we present key aspects of our work and findings to date in three distinct parts. Part 1 summarises the main findings from an extensive review of the literature related to RTL that we undertook, and in which we synthesise the literature on RTL into four distinct areas comprising: perceptions of RTL; principles of RTL; productivity in RTL, and practice in RTL. In the latter area we consider the concept of the 'curriculum as praxis'. Part 2 of the paper describes and reports on the emerging findings of our own research, which took the form of a phenomenographic study investigating the conceptions of and approaches to RTL within the range of staff who are participating in the aforementioned institutional project. The phenomenography represents a contribution to a relatively small research base of phenomenographic research concerning RTL. In Part 3 of the paper we consider and look towards how we reconcile the promise and possibilities of RTL, particularly in relation to the 'curriculum as praxis', with the perceptions and practices emerging from our phenomenographic study. In doing so we offer a consideration of practical next steps that we are now taking, including recommendations we hope others may find useful.

Keywords: Research, teaching, research-teaching linkages, RTL, curriculum, praxis, phenomenography

Introduction

Institutional context

The University of the Highlands and Islands (UHI) is a relatively young, geographically distributed and academically diverse Higher Education Institution, which is based in Scotland. The university characterises its core academic mission and focus as being related, in part, to its geographical context and an aim to promote and deliver transformative empowerment (economic, social, and educational) within the region in which it is located. This comprises the entirety of the Highlands and Islands of Scotland which, for comparison, is an area roughly the size of Belgium. UHI is a federated university that encompasses both Further Education (FE) and Higher Education (HE), and is comprised of thirteen Academic Partners (APs) across the region which include FE and HE focused colleges and specialist research institutes.

The economic and broader societal needs of the Highlands and Islands have a number of unusual, if not unique, characteristics within Scotland, but with similarities to a number of other parts of the world (e.g. areas of Canada, Scandinavia, and the Republic of South Africa). The University operates across a rich range of communities, from academic facilities (or campuses) in one small city (Inverness) and medium-sized mainland-based towns, to various locations on the Islands of Scotland, and smaller settlements on both the mainland and the islands. These facilities are complemented by a network of learning centres that are located across the region in largely remote and rural contexts, to provide physical and accessible space for the university's students who live and work in their home communities.

The region is largely dominated by Small and Medium-sized Enterprises (SMEs) rather than large-scale businesses and industry, along with many highly active localised community groups. However, the importance of the Highlands and Islands region to the Scottish (and broader UK) economy has been recognised not least in terms of tourism, environmental science, history, culture, fisheries, whisky production, forestry, and offshore wind and wave energy.

UHI's links with its various communities, and with the economic, social and cultural interests that affect the region as a whole, have led to opportunities for engagement in research and teaching, and the linkage between the two, that provides an essential source of opportunity. Within this general context, the university has made a deliberate commitment to develop, extend and embed research-informed teaching and curricula, and to ensure a high quality, contemporary student learning experience. However, while many staff draw upon their own current research, and that of others, in their teaching practice, it is recognised that there is scope to go further in the alignment between, and integration of, research and teaching. Through doing so, the university hopes to not only further enhance learning and teaching, but also: foster an increasingly strong research culture that will ensure the continued relevance of the curriculum to the region and our communities, and to our students with respect to their employability; support greater staff and student engagement in research and knowledge production; and support student transitions from FE to HE, and onwards into postgraduate study and research.

Overview and purpose of investigation

In the light of the above, the university approved a broad-based Research-Teaching Linkages (RTL) project to enhance, embed and then extend the institution's approach to RTL activity, and thereby to establish a fresh and relevant approach to research-informed curriculum development that is both academically robust and fit for purpose in the unique context of UHI. The project, initiated during 2017 and running to 2022, secured endorsement to progress across the institution's FE and HE activity, *but with an initial focus on undergraduate and postgraduate HE and the transition points from FE to HE*. While the work we report herein is therefore focused on RTL with HE, the issue of RTL within FE is central to our ongoing work for the RTL project and we are progressing research and developmental activities pertaining to this at the moment.

The initial aims of the RTL project were to: (a) establish an understanding of the different ways in which RTL can be conceptualised and understood, including the potential value of RTL to internal and external beneficiaries; (b) to work with ten 'pilot' groups, comprised of modules and programmes in a range of discipline areas, to evaluate and enhance RTL in the curriculum and associated learning and teaching activities; (c) to develop and implement resources and interventions to support a wider cascading approach to the development of RTL; and (d) produce research-informed outputs for the sector.

It should be noted that while we recognised from the outset the spectrum of activities and range of terms that can be associated with RTL, including research-informed teaching, research-based learning and teaching, and research-led learning and teaching, we use the term RTL as an overarching one that encompasses the aforementioned and other recently emerging practices. The latter include, and which we subsequently come on to explore, concepts and approaches related to 'Student as Producer' (Neary, Saunders, Hagyard & Derrico, 2014) the Connected Curriculum (Fung, 2017), and 'the curriculum as praxis' (Hall & Smyth, 2016; Johnston, MacNeill & Smyth, 2019). The latter, concerned with conceptualising and enacting the curriculum as a means and medium through which to address directly the knowledge requirements and needs of our wider communities and society, was identified as a key touchstone and aspirational end point at the outset of the project.

Since being initiated, the project has expanded to working with module and course teams in fifteen different disciplines rather than the ten originally aimed for, due to higher than expected levels of interest for participating in the project. The disciplines we are working across include music, art, business studies, computing, theology, Gaelic, drama, psychology, health sciences, early years childhood development, ecology, sustainable development, teacher education, higher education practice and marine science. Colleagues from across these disciplines and from the majority of the university's academic partners are being supported to explore, enhance and share their RTL practices through a longitudinal series of workshops, peer-peer support, and critical friend input from both within and out with the university from colleagues who are already well versed in the challenges of, and pedagogic approaches for, implementing RTL.

It is mainly with aims (a) and (b) above that this paper is concerned. With respect to (a), key activities undertaken to date have included: an extensive literature review conducted to summarise and synthesise theory and research, which have served to provide a strong and extensive grounding for the activities of the project; and a phenomenographic investigation which allowed us to explore the range of ways in which RTL was being conceptualised and practised by those colleagues who are participating in the project. The interviews conducted for the phenomenographic investigation also served to evaluate existing practice, therefore partially addressing (b). In what follows, we consider first the key findings from the literature review, and what this tells us in relation to how RTL is conceptualised and practised within the wider field, and then explore the nature and key emerging findings of the phenomenographic investigation.

We then conclude by reconciling the findings and implications of the literature review and phenomenography, and evidence our progress towards fulfilling aim (c) by exploring some of the current and future resources and interventions that are being implemented to support a wider approach to developing RTL within the curricula and learning and teaching at UHI.

Part 1. Review of the literature

Many scholars trace the origins of RTL to von Humboldt's view that unification between teaching and research is the very characteristic that separates university from school education (von Humboldt, 1810), and this view remains still prevalent in the more recent literature we come on to explore. The main body of work concerning RTL emerged in the 1990s, certainly

within the UK, when increased attention on RTL was partly a response to the rapid expansion of participation in HE that was occurring at that time (primarily post-1992). The political discourse around the massification of HE focused on the economic role that universities play in producing the future workforce, which raised important questions concerning the purpose of the university and the nature of relationship between research and teaching (Mcnay, 2006).

There were also several policy developments globally in the late 1980s and the 1990s which provided an additional focus to scrutinise RTL. In the UK this included The Dearing Report (NCIHE, 1997), which recognised that “a distinctive feature of higher education is the link between research, scholarship and teaching” (Section 8.9) and observed that teaching was perceived as ‘devalued’ in comparison to the substantial funding attached to research. The Magna Charta Universitatum (Various, 1988) constituted an agreement between over 300 European universities concerning the guiding principles for universities, stating that teaching and research should be ‘inseparable’ in order to deliver relevant teaching and meet societal needs. In the USA, the Boyer Commission report (1998) made ten recommendations for the transformation of undergraduate education, the first being to make ‘research-based learning’ standard in all universities.

The literature concerning RTL is expansive. This is partly due to the wide range of activities that can be conceived under both ‘research’ and ‘teaching’, along with the myriad ways these different activities can be linked. However it is possible to identify distinct strands of thinking and research. Smeby’s (1998) review of the literature exploring the relationship between research and teaching distinguished between literature concerning: historical lines of development; productivity (in research) of academic staff and evaluation of teaching; and association between research and teaching (as manifested in teaching). In a more recent review, Malcolm (2014) also identifies three broad areas of the literature concerning: enabling the nexus in academic practice; enhancing the nexus in practice; and evaluating progress and potential.

Using the broad distinctions identified between Smeby (1998) and Malcolm (2014) as a starting point, and drawing on some of the same and also more recent literature, we found it beneficial in our own review to differentiate between four areas of RTL theory and research concerning: *Perceptions* of staff, students and other stakeholders on the link between research and teaching; *Principles* that articulate what the link ought to be, and what activities can be classified as linking research and teaching; *Productivity* in which evidence for a positive connection between research activity and teaching is established; and *Practice (and praxis)* concerning the wider effects or impacts of linking research and teaching. The strands are not wholly distinct conceptually or chronologically but form convenient categories through which to consider the field.

Perceptions of research-teaching linkages

Ramsden and Moses (1992) state that “Few beliefs in the academic world command more passionate allegiance than the opinion that teaching and research are harmonious and mutually beneficial” (p. 273). This ‘received view’ that research and teaching are, and ought to be, linked is intuitively appealing. However, many studies focusing on perceptions of RTL reveal mixed views amongst academics and students concerning the nature of the research-teaching relationship, and whether it is beneficial. Some studies do underline an acceptance of the received view by academics (e.g. Neumann, 1992; Stanton, Taylor & Stanaland, 2009), yet others reveal more variation in staff perceptions. Robertson and Bond (2001) identify five different experiences of the research-teaching relationship ranging from ‘Research and teaching are mutually incompatible activities’ to ‘Teaching and research share a symbiotic relationship in a learning community’. Further studies support a perceived separation of research and teaching in the lived experiences of academics (e.g. Bazeley, 2010; Kyvik, 2013).

Studies involving students show that they perceive some benefits to being taught by staff who are research active, such as increased understanding of their subject, perceiving their course content as relevant and current, and stimulating students’ interest and enthusiasm (Neumann, 1994; Jenkins, Blackman, Lindsay & Paton-Saltzberg, 1998; Lindsay, Breen & Jenkins, 2002). However, students also report negative aspects of staff involvement in research, including staff research interests dominating the content of what they teach, lack of staff time due to research commitments, and apparent lack of staff interest in students’ learning (Healey Jordan, Pell & Short, 2010; Turner, Wuetherick, & Healey, 2008; Hajdarpasic, Brew & Popenici 2015). Students also identify research as something that happens quite separately from them (Jenkins et al. 1998, Lindsay et al. 2002; Zamorski 2000) so while staff being research-active is something they value, they do not necessarily view themselves as part of a research community. There is also some evidence that student perceptions diverge with those of staff concerning the very nature of research itself (Buckley, 2011), with staff viewing research as the pursuit and generation of new knowledge, but students focusing on the process of enquiry rather than the product.

Characterisations of the nature of the research-teaching link have emerged from these studies. Neumann (1992, 1994) creates a framework which characterises the link as operating on three levels: tangible (the transmission of knowledge and skills); intangible (the transmission of approaches and attitudes to knowledge); and global (the direction given to course offerings by departmental research activity) (Neumann, 1994, p.324). Similar features have emerged from other studies wherein staff identified the following activities as evidence of the link: teachers transmitting the latest knowledge from research to their students, and teachers encouraging them to develop a critical approach and think in ‘research mode’ (Robertson & Bond, 2001; Buckley, 2011).

Principles of research-teaching linkages

A substantial portion of the RTL literature is concerned with establishing the nature of the link between research and teaching. Studies within this area are largely normative (stating what the link ought to be) and conceptual (unpacking the concepts of both 'research' and 'teaching' to draw conclusions about how they are linked). Implicit is the view that linking research to teaching enhances student learning.

The most prevalent typology of RTL activity is that of Healey (2005, 2009) who distinguishes between four types of teaching via their relation to research on two axes. The first axis depicts which aspects of research are emphasised, and ranges from the content of the curriculum at one end to problems and processes at the other. The second axis depicts the approach to teaching that is taken and whether this is teacher- or student-focused. The model describes four types of teaching: research-tutored, research-based, research-led and research-oriented. These are summarised in Figure 1 below, along with examples of the type of curriculum content that exemplifies them.

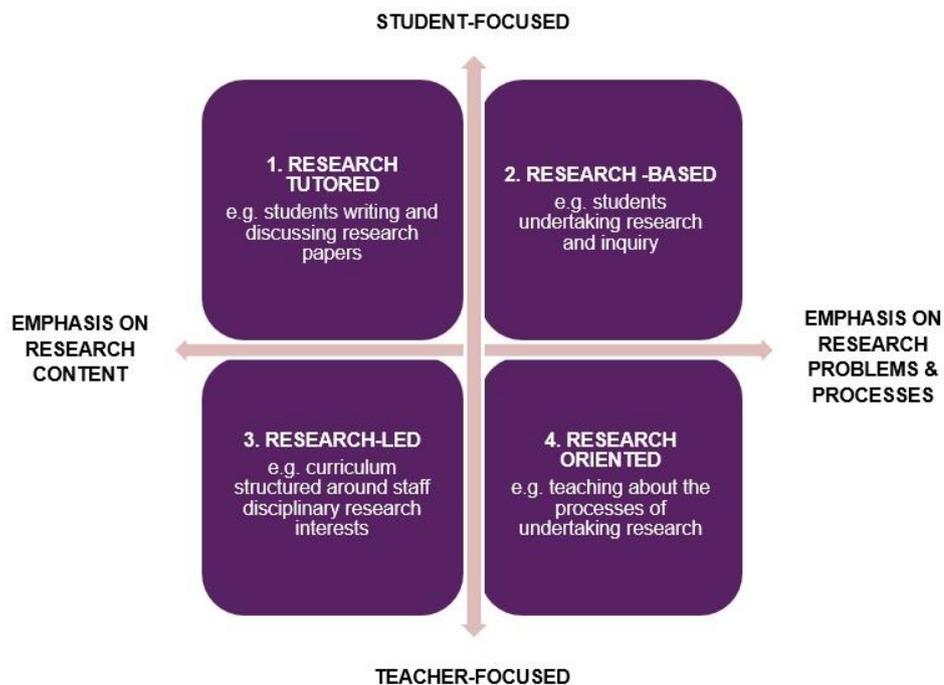


Figure 1 The Healey Model of RTL (Healey, 2005)

Brew (2006) constructs two alternate models of the relationship between teaching and research, based on different conceptions of knowledge and of teaching. The first model characterises knowledge as objective and separate from knowers and aligns this to teacher-focused approaches based around the transmission of information from teacher to student. The second model characterises knowledge as constructed, with the corresponding teaching as student-focused and based around students' conceptual change rather than knowledge acquisition. Other typologies exist, such as Ozay (2012) who adds a fifth 'quadrant' ('research-informed') as a central element governing the whole model. However, few diverge greatly from the Healey model (Elken & Wollscheid, 2016, provide a fuller synopsis of this area of the literature).

Healey particularly advocates the 'student-focused' approaches in the top half of the typology, favouring research-based teaching (quadrant 2) as the focus of RTL activities: "students are likely to gain most benefit from research, in terms of depth of learning and understanding, when they are also involved in research, for example, through various forms of active learning, such as inquiry-based learning" (Healey, 2005: 68). Healey and Jenkins also argue that the richest, most effective forms of learning occur when "students learn and are assessed in ways that come as close as possible to the experience of academic staff carrying out their disciplinary research." (2009, p.3). Healey's model is one of the key pieces of literature within RTL, and widely cited. However, Malcolm (2014) points out that the four quadrants only partially represent actual practice in RTL, contending that "They are useful organising devices rather than conceptual models" (2014, p.293).

Productivity in research-teaching linkages

The 'productivity' strand of the RTL literature concerns attempts to provide evidence to substantiate the view that linking research with teaching is beneficial, and consists mainly of quantitative studies. These studies focus exclusively on the influence that research can have on teaching, particularly on showing "that research productivity enhances teaching effectiveness and not the other way round." (Brew & Boud, 1995, p.264-5). The emphasis within this area of the literature is not on what and how students are taught (as in the Healey model) but on the link between the work and outputs of teaching staff with respect to their engagement in research activities and whether that evidences them being effective teachers.

In many of these published studies, little evidence is found to support such a link. An early study in the UK (Centra, 1983) showed no significant relationship between research productivity and teaching effectiveness. This is echoed by studies in the United States (Feldman, 1987), Australia (Ramsden & Moses, 1992) and most significantly by Hattie and Marsh's meta-analysis of several empirical studies which showed a zero or weak relationship between research productivity and teaching effectiveness (Hattie & Marsh, 1996). Others have criticised the 'narrow view' taken in these studies, arguing that reducing research to, for example, the number of publications and reducing teaching effectiveness to student evaluations of teaching, fails to take account of the multifaceted nature of both teaching and research (Brew & Boud, 1995; Elton, 2001).

In a more recent study, Galbraith and Merrill (2012) replace student perception as a measurement of teaching quality with a standardised test of learning outcomes. They find a positive and significant correlation between the research productivity of individual teaching staff and teaching effectiveness when measured by students' achievement on a standardised test. This result is dismissed by Malcolm (2014) as falling foul of the same criticisms that apply to earlier quantitative studies; i.e. "specifying what counts as research and including all legitimate outcomes of teaching quality persist in undermining the value of this line of enquiry" (Malcolm, 2014, p.292). However, the finding of the study; that staff research productivity correlates with student performance, is noteworthy, whether or not it constitutes positive evidence of a substantive and meaningful link between research, teaching and student learning.

Practice (and praxis) in research-teaching linkages

Studies concerning the practice of RTL are mainly confined to examples of students engaging in 'research-like' activities (quadrant 2 in Healey's model). These span a huge range of teaching practices including: group work, authentic assessment, active learning, experiential learning and inquiry/enquiry-based learning. Studies range from purely descriptive case studies of 'research-type' activities to evidential studies which provide data concerning the effectiveness of these practices at generating outcomes such as improvements in student learning and skills development. There is considerable overlap between many of the concepts in this area, for example experiential learning and inquiry-based learning can be regarded as a subcategory of active learning (e.g. Spronken-Smith, Walker, O'Steen, Matthews, Batchelor & Angelo, 2008). Additionally while all forms of enquiry/inquiry-based learning could be described as learning in 'research mode' (Levy & Petrulis (2012) use the terms 'research' and 'inquiry' interchangeably) this is arguably not true of all instances of group work, for example.

In terms of what might be termed 'research-like learning' Freeman et al. (2014) present an impressive body of evidence of the effectiveness of active learning in science, engineering and mathematics. The activities and interventions classified as 'active-learning' in this study were broad (group working, use of personal response systems, studio or workshop-based teaching) and varied in intensity from occasional use within a module or programme to whole modules based around studio work. Their meta-analysis of 225 studies showed that students engaged through active learning approaches, as opposed to those receiving traditional lecture based teaching, scored higher on exams and were less likely to fail.

Wood's (2010) meta-analysis of enquiry based learning projects found benefits for students in terms of attainment, engagement and interest, students' enjoyment of their learning experiences, group cohesion, and movement to "independent and active modes of learning" (Wood, 2010: 24). Healey and Jenkins (2006) also cite a number of studies that show the benefits of active and research-based learning on student skills and understanding. These include Blakemore and Cousin (2003) who showed that students involved in research reported greater levels of understanding, greater feelings of belonging and the enhancement of generic and specific skills (Blackmore & Cousin, 2003, 24–25). Additional studies also link active learning to enhancements in student learning and skills development (e.g. Adedokun & Burgess, 2011; Cheesman, 2015), while Pascarella and Terenzini's (2005) review of the literature on undergraduate research demonstrate positive effects on persistence, completion and transition to postgraduate study.

Current thinking related to RTL in practice, and the wider benefits this may bring, has been advanced in recent years by the implementation of the 'Student as Producer' work at the University of Lincoln, and the 'Connected Curriculum' initiative at University College London (UCL). Student as Producer began as a project at the University of Lincoln between 2010 and 2013 (Neary, Saunders, Hagyard & Derrico, 2014). The project's aim was to promote research-engaged teaching "as the organising principle for teaching and learning across all subjects and all levels of taught provision at Lincoln" (Neary et al. 2014, p.5). Like earlier proponents of RTL, the intellectual basis for the Student as Producer movement looks back to Humboldt's idea of the university in which research and teaching were fundamentally linked, and to the work of Boyer in transforming the educational experience of students at research intensive universities (Boyer Commission 1998). Student as Producer also draws on critical pedagogy (e.g. Freire, 1970; Rikowski, 2006; Amsler and Canaan, 2008) and the work of Vygotsky (1986).

For Vygotsky, learning must be attached to practical tasks in order to lead to intellectual development. The Marxist grounding to Vygotsky's thought sees 'learning by listening' as akin to the "alienating labour process of the capitalist factory" (Neary, 2010, p.5). Key to this thinking is that students should not consume 'ready-prepared' knowledge that is packaged up and presented to them by the teacher, but be actively engaged in practical tasks through which true learning can occur. Student as Producer is a dialectical alternative to 'Student as Consumer'; a phrase which denotes both the student as the passive consumer or recipient of knowledge, learning and teaching, and as the customer in the transaction which is their university experience. There is a strong 'student as public scholar' dimension to Student as Producer too, wherein "undergraduate students [are] working in collaboration with academics to create work of social importance that is full of academic content and value" (Neary & Winn, 2009, p.193).

The endeavour to produce knowledge and knowledge artefacts of social and intellectual value beyond the university itself is also central to the Connected Curriculum at UCL (Fung, 2017). The Connected Curriculum framework is an institution-wide scheme that aims to embed six RTL dimensions within the learning experience at all levels (Fung, 2017, p.5): (1) *Students connect with researchers and with the institution's research*; (2) *a throughline of research activity is built into each programme to support cumulative learning*; (3) *students make connections across subjects and out to the world*; (4) *students connect academic learning with workplace learning for employability*; (5) *students learn to produce outputs to make a meaningful contribution to society (e.g. assessments directed at an audience, to meet specific needs)*; (6) *students connect with each other, across phases and with alumni, in being part of a learning and research community*.

Fung (2017) subscribes to the Humboldtian notion that the connectedness of research and teaching is fundamental to the very notion of a university, and also argues that the positive impact between linking research and teaching is two-way rather than one-way: "Creating a curriculum that links these diverse landscapes of enquiry more explicitly and more creatively for students has the potential not only to enhance the quality of education but to enrich research itself, and to strengthen further the impact research and scholarship already make on the world" (Fung, 2017, p.2)

In considering the different ways the curriculum can be enacted, Hall and Smyth (2016) explore key distinctions between the curriculum as: a body of knowledge and skills to be transmitted and learned; a process of interaction between teachers, students and knowledge; and the concept of the curriculum as praxis, drawing on Freire's (1970) definition of praxis as "reflection and action directed at the structures to be transformed" (p.126). In the examples of Student as Producer, and particularly the Connected Curriculum, there is a commitment to the 'curriculum as praxis' in the relationship between research-based activity, student learning, and meeting wider societal needs and challenges.

This positioning of the curriculum is also central to the model of the 'Digitally Distributed Curriculum' proposed by Johnston, MacNeill and Smyth (2019), which is based on the values of praxis, public pedagogy and participation, linked to enabling dimensions that include co-location, porosity, co-production and open scholarship, and associated pedagogic practices and interventions. Within their model, students engage as digital public scholars in undertaking individual and collaborative projects with a clear public dimension, sharing outputs as digital artefacts and open knowledge resources.

Part 2. Our original research

Phenomenography was selected as the research and analysis method through which we would explore the range of ways in which RTL was being conceptualised and practiced by those colleagues who are participating in the project, with the interviews conducted across 2017 to 2019 at the various points at which colleagues joined the project. The findings therefore represent the conceptualisations and current practices of colleagues that were being held and implemented either at the outset or shortly into each individuals' engagement with the RTL initiative, and prior to engaging in enhancement activities.

The phenomenographic study is one of two the project is conducting. There will be another conducted towards the end of the project to explore whether there has been any marked evolution in how participants think about and implement RTL. The colleagues who are participating in the project and interviews will also be taking forward in their own right another research dimension to the project, which is to evaluate (by various means) the RTL experiences of their own students.

To this end all of the colleagues who are participating in the RTL project are also co-investigators, and were named as such on the ethical approval application for the project. The ethical approval for the project, granted by UHI in 2017, applies to each aspect of the longitudinal research being undertaken: the initial and concluding phenomenographic studies, and the research and evaluation of the student experience being undertaken within the context of the pilot projects.

Participants and consent

Participants for the RTL project were identified through an open call within the university. This brought forward colleagues from across twelve of the aforementioned discipline areas, with an additional three areas subsequently becoming engaged in the project (these being drama, marine science and higher education practice). All of the participants were experienced educators within their discipline area (i.e. none were 'early career'), with each having module and/or programme leadership responsibilities. Four participants also held senior academic roles within their own Academic Partner or with the university (curriculum leader, reader, research co-ordinator, professor). Experience of research within their respective disciplines varied. The four colleagues holding senior academic roles had well-established research profiles. Within the remaining participants, there was a broad division between those engaged in knowledge exchange with industry and/or disseminating practice and evaluative work through report writing, presenting or other scholarly activities, and those who had been engaged in undertaking and disseminating their own research including producing peer-reviewed publications.

For the initial phenomenography reported herein, interviews were conducted with fourteen academic staff across the aforementioned discipline areas (excluding the three discipline areas identified as becoming subsequently engaged). In two instances two individuals were teaching on the same modules and programmes. However they were interviewed individually, in adherence with the phenomenographic method, and also because the primary interest was with gauging the range of conceptions, perceptions and experiences of RTL across the group.

Individual interviews lasting typically 40-50 minutes were undertaken. Each interviewee was asked a number of open, non-leading questions, with the opportunity for follow-up prompts and questions where necessary. All interviews were audio recorded, transcribed verbatim, and then analysed according to the phenomenographic thematic analysis process. The qualitative research application NVivo was used to manage the transcripts and assist with organising the thematic analysis.

Illuminating current practice and conceptions

Phenomenography is an educational research method that is concerned with illuminating and understanding the qualitatively different ways in which the same educational phenomena, and aspects thereof, are perceived, conceptualised, approached and experienced (Marton, 1994). While originally focusing on different dimensions of the student experience of learning in HE contexts, including reading academic texts, revising for exams, problem-based learning, and the nature of deep, surface and strategic approaches to studying (Marton, Hounsell & Entwistle, 2005), phenomenographic research has also contributed substantially to our understanding of the experiences of academics and other educational practitioners.

Phenomenographic investigations that have explored dimensions of the staff experience have spanned issues and areas of practice including experiences of educational leadership (Martin, Trigwell, Prosser & Ramsden, 2003), conceptualisations relating to scholarship and scholarly practice (Trigwell, Prosser & Taylor, 1994; Trigwell, Prosser & Waterhouse, 1999), and experiences of becoming a university teacher (Akerlind, 2004).

Within the area of research related development, experience and practice, Brew (2001) took a phenomenographic approach to identifying qualitatively distinct external and internal orientations that academics held towards undertaking research, and different perceptions of research in relation to: answering questions/solving problems; discovering, uncovering or creating meaning; the social exchange of knowledge and ideas; and as a personal journey of discovery (Brew, 2001, p. 280).

The five qualitative differences in how the relationship between research and teaching was conceptualised by academics, as identified in the phenomenographic study by Roberston and Bond (2001) mentioned in our literature review, comprised: research and teaching as mutually incompatible activities; little or no connection existing between research and teaching at undergraduate level; teaching as a means of transmitting new research knowledge; teachers model and encourage a research/critical inquiry approach to learning; and teaching and research sharing a symbiotic relationship within in a learning community (p.10). Furthermore, out with academia, Dupin, Larsson, Dariel, Debout and Rothan-Tondeur (2015) present a phenomenographic study concerning nurses' conceptions of learning to become researchers. This identified qualitative differences in becoming research engaged, including distinct modes of commitment and needs for support.

There is also a focused but interesting phenomenographic literature concerning student perceptions of the relationship between research, teaching and learning. This includes the study by Kawulich, Garner, & Wagner (2009) exploring student conceptions and misconceptions of social research, and the study by Joseph-Richard & Jessop (2020) concerning research informed teaching from the perspective of Masters students. We intend to explore this dimension of phenomenographic research further as we progress in supporting participating staff to evaluate their own students' experiences.

Beyond the semi-structured interviews that phenomenographic studies employ, at the analysis stage an iterative process of thematic analysis is undertaken to reveal the different ways in which aspects of the phenomena of interest – in our case perceptions, conceptions and practices related to RTL – have been experienced. The analysis process is focused on producing thematic 'categories of description' relating to different perceptions, conceptions and experiences pertaining to specific aspects of the phenomena. The categories of description are normally then organised into an 'outcome space' (model, framework, other representation) that attempts to depict the structural organisation of the categories of description and including the variation within and relationship between the categories of description (Marton, 1994).

Within our interviews, we explored questions that related to four broad themes: (1) personal views and perceptions in respect of the RTL and what this entails; (2) views and perceptions on the value and benefits of RTL to various individuals and constituents; (3) views and perceptions on the importance and significance of RTL in the university and the HE sector; and (4) views and perceptions of the challenges and/or opportunities that exist for the further embedding of RTL at UHI.

We now consider some of the selected key findings that have emerged from our interviews and subsequent analysis, in three specific areas pertinent to the current and subsequent directions for the RTL project at the university. The phenomenography, and the related findings, represents a further contribution to the relatively small published research base that has explored dimensions of RTL in HE, and one we hope will be of benefit beyond our specific project.

Perceived benefits to students

With respect to participants' current understanding of RTL, in what we came to categorise as 'conceptions of RTL', the process of phenomenographic analysis revealed intentional dimensions focused on: current research informing the content of the teaching and the curriculum; students being 'research aware' through engaging with reading and analysing existing research within their discipline; and for students to learn about doing research (primarily to meet the requirements of undertaking specific coursework activities). For example:

"...my understanding {of what RTL is and entails} would be that it's kind of an ideal situation, I suppose, for the latest thinking in research, the latest findings to be informing the content of undergraduate courses."

"From a student's perspective, I would expect students' learning to be based around their research and relevant scholarly activity. I would expect them to be reading widely. I wouldn't be expecting them to be doing necessarily empirical research as you would if you are, kind of, an academic. Aside from, say, for dissertation and things like that."

There were emergent perspectives pertaining to the 'student becoming researcher', related to their identity and practice beyond their course and university, albeit this was seen as an ideal rather than something being activity embraced:

"The other layer would be...engaging the research community within the learners that I'm involved with. Trying to help them to understand that "Yes, you're here to learn and develop your knowledge and understanding. You're also active researchers in that capacity." Trying to help them to appreciate that that's what they're doing; and that when they leave they can still carry that on. It's not something that just ends when they graduate. For me, that layer is probably missing a little bit now."

Within phenomenographic research it is common to find the emergence of structural and referential dimensions in how the phenomena in question is being perceived, conceptualised or understood (Brew, 2001). We observed a relationship between the different ways in which RTL was being conceptualised and understood, and perceptions relating to what we came to identify as intentional or transformational dimensions for student learning and development.

These dimensions included 'developing critical thinking' and 'transitioning to practice', with the latter being linked to readiness for employment or progression into contexts where research and professional practice were related:

"It's about [students] trying to develop a critical eye. Develop a way of just questioning, pondering, thinking" and "Say even if you're going to be a primary school teacher, you need to be able to think critically about what you're teaching to your pupils"

"If they want to go on to a research career or if they want to go and work in public sector, for example, then they're aware of the latest thinking around policy and implementing into practice."

There was also an extrinsically focused dimension around students 'transforming the world' around them:

"...we're not set on this planet to just be told what to do and how to live our lives...It's not just about carrying out the research, it's about a way of being...so that when they [the students] go out into the world after you, regardless of the research or whatever they've done within the course, that they can give more. They can make a difference in this world."

However, and as partly alluded to above, while there were clear perspectives on what could be viewed as more personally developmental or outwardly transformational aspects to RTL, many of the actual practices described were within the domain of research informed teaching practice, extending through to research skills development:

"Over the last 20 odd years I've had quite a bit of experience of lecturing, so that's a combination of my own research and giving, you know, data examples and actually giving students the opportunity to work with that. So they're getting a real feel of the problems, issues, questions and things that you can kind of get from analysing a real data set."

Examples of students actually undertaking their own research within their modules and programmes were largely limited to small-scale investigative tasks and coursework involving 'desk research', and research design and data analysis activities undertaken in the context of research methods modules, as preparation for undertaking dissertations at undergraduate and Masters levels. The dissertation was perceived to be, and was the recurring example given, of students engaging in a substantive research task within their studies. However, broader practices that spanned the nexus between the teaching and learning, the curriculum, and the wider community, did emerge in two examples of consultations and project scoping proposals that formed the basis of group coursework activities in the areas of public health science and the arts. These involved what might generally be called 'participatory action research' investigations that were coordinated by the tutors, and within which students undertook authentic assessment in the form of producing project plans, briefs and resources.

Perceived benefits for and beyond the institution

In exploring views and perceptions concerning the wider benefits, beyond the university, that a greater embedding of RTL in teaching and learning, and the curriculum, would offer, themes that emerged included 'research sustainability' and 'impacts on disciplinary practice'. These tended to be linked to the work or practice of the academics themselves, and the wider academic or disciplinary communities that they belonged to and which their own teaching and research supported:

"In my area, you know, in ecology and geography, you've got sites where you've got research that's been going on year on year and you're accumulating long data sets, linking students into that is incredibly valuable...The students keep going back each time, in order to take further forward, you know, a set of data and they're reanalysing it or analysing it in different ways. And of course, ultimately what you're going to get from that are papers..."

"Yes. I mean, in our case, the primary benefit would be, I would say, for the [type of organisation in question]. So in that sense, that's kind of a significant if not the main target group in that sense. So, our degree, whilst academic, is also vocational, preparing people for [a specific type of public-facing working practice]. So, I think the benefit of research-teaching linkages is that they teach and inspire students to be thoughtful [with respect to the form of practice being prepared for]."

The theme of 'societal impact' is clearly implied in perceptions such as those above, encompassing contributions through RTL to scientific endeavour, published knowledge domains, and public facing work and practice. It was also strongly evident in the aforementioned examples of public-facing participatory action research projects being progressed, including work to support addiction recovery groups through the redesign of consultation spaces in clinics:

The [members of the] addictions recovery groups say that when they are called for an appointment, they have to walk along this row of quite scary people, even just to get in to see a clinician...I will create a brief that will be wide enough to allow some of my emerging [student] artists who are involved in socially engaged art to participate [in the redesign of the spaces]."

Developmental dimensions

In exploring perceptions around the challenges and enablers for the further development and embedding of RTL at the university, a range of themes were identified that included 'staff enablement' and 'student readiness' for engaging in RTL.

Qualitatively different perceptions relating to 'staff enablement' have included 'disaggregation of teaching and research', 'valuing of research and RTL' and 'demystifying research and RTL', for example:

"Better communication between staff that are purely teaching and staff that might be purely research. I don't know, I just think the closer the collaboration, the better. I think that would strengthen us to have one identity."

"a lot of the terminology that research uses, without really thinking about it, can sometimes be a bit of a barrier, There is a sort of notion of it as the other, as not teaching, and some of it probably is other to teaching, but not all of it...I think in some instances where there are really good connections, there is probably still potential to give both the research and teaching a shared focus. To make it [RTL] acceptable and something that is all part of the same thing."

With respect to 'student readiness' to engage, one strongly emerging view concerned 'expectation to be taught' rather than engage in inquiry: *"dealing with mostly first-year students, they're more accustomed to getting a lesson rather than creating one for themselves. That change in perspective is really important if your ultimate aim is to produce researchers."*

With the potential developmental interventions that were explored, 'scaffolding RTL within the curriculum' so that research-informed and research-based teaching and learning were introduced at the outset, and developed as the student progressed through the curriculum, was viewed as an important enabler. So too was the need for 'illuminating the possibilities' through exemplars and associated resources that could provide effective examples of RTL practice, including of student engagement in research and scholarship, both generally and in relation to the specific discipline areas of the practitioners.

Part 3. Reconciling the challenges and implications

In considering the most pertinent findings of our literature review with those of our own research to date, we have recognised a number of challenges that require addressing in relation to our overall objective of further developing and embedding RTL at our institution, and extending this to realising RTL practices that align with the 'curriculum as praxis'.

With respect to the conceptualisations, perceptions and practices relating to RTL within the group of academics participating in the RTL project at UHI, it is apparent that there is an overall locus of thinking and engagement within the tutor-focused 'research led' and 'research orientated' quadrants of the Healy (2005) model of RTL. There are however developmental orientations towards, and a valuing 'in principle' of, the student-focused quadrants of 'research tutored' and 'research based' learning in the Healy model. There are also limited examples of practice in these quadrants, including inquiry based activities and community-focused action research in which tutors and students are collaborating, and within which authentic forms of assessment, of the kind the literature review suggests are linked to more immersive and richer learning, are being featured (Healey & Jenkins, 2006; Wood, 2010; Freeman et al. 2014).

Our challenge in progressing from the starting position outlined above, and highlighted in the findings of our phenomenography, has been to find ways to benchmark and 'illuminate' what RTL can look like in practice, from research-informed teaching and learning, through research-based teaching and learning, and progressing to research-led and research-driven conceptions of learning. With respect to research-led and research-driven approaches, we are specifically interested in moving towards the more advanced types of practice associated with 'Student as Producer' (Neary & Winn, 2009), the 'Connected Curriculum' (Fung, 2017), and the emphasis on the notion of students as public scholars, creating and openly disseminating knowledge artefacts and research-based outputs for a wider public good, that is associated with the 'curriculum as praxis' (Hall & Smyth, 2016) and 'Digitally Distributed Curriculum' model (Johnston et al. 2019).

We have sought to meet this challenge in a number of ways. Near the outset of the project, we undertook and produced the first iteration of the extensive review of the literature that we have drawn selectively from in Part 1 of this paper. This helped us to establish a wide 'evidence base' of theory, practice and examples that the project team and project participants have been able to draw upon as we have collectively explored the further possibilities for developing RTL at the university, and as the participants began to refine and extend their approaches to RTL in their own modules and programmes.

To provide pragmatic support to participants in coming to further understand the field of RTL, and to enhance RTL practice in their teaching and learning contexts, we have supported the process of curriculum re-design through a programme of

participative, action-orientated workshops within which colleagues have been supported in co-designing RTL interventions which are currently at various stages of implementation. The initial workshops introduced the aims of the project and key concepts in RTL, within which we drew a distinction between: research-informed teaching and learning; students learning to do research (e.g. research methods); students learning in research mode (e.g. enquiry based); research focused and driven curricula models (including Student as Producer); and the curriculum as praxis (research focused and driven curricula and associated approaches to teaching and learning that are directly focused on addressing and responding to specific challenges and knowledge needs for organisations and groups within our communities, for wider society, and for the environment).

Participants were asked to benchmark where they were on the continuum above, and to identify medium and longer term enhancements to RTL that could be implemented, and evaluated, in relation to the specific module or programmes they had chosen to work on. This led into the production of what were effectively RTL design and implementation plans, which were refined through review and critical friend input. The critical friends identified to be part of the wider project team included internal and external experts already experienced in implementing RTL at the more 'advanced' end of the continuum above.

The production of the literature review as an evidence-base of theory and research, the participative workshops, and the critical friend input have all been vital to helping participants bridge the 'theory into practice' gap that was apparent from the initial phenomenographic interviews, and for identifying ways for participants to progress RTL practice along the continuum above in ways that are appropriate to their discipline, their students, the level of learning, and what is to be learned.

The workshops held latterly, prior to the COVID-19 pandemic impacting the UK in March 2020, had been focused on identifying and developing appropriate approaches for participants to research and evaluate the student experience with respect to the RTL enhancements they had begun to implement. In parallel, the project team and participants began to develop case studies relating to RTL practices in different disciplinary contexts, drawn from inside and beyond our own institution, to exemplify and share approaches, recommendations and lessons learned to guide the practice of others.

The various resources, workshop interventions, and evidence produced to date, and by the conclusion of the project in 2022, will be the basis for a 'RTL Toolkit' which will be a key output of the project, and which we intend will support the further cascading and embedding of RTL approaches at the university and within the sector (as the toolkit will be an open resource).

Important cultural and personal development dimensions to the furthering of RTL at the university emerged through our phenomenographic research. These included the need to 'demystify' RTL, and to introduce RTL from the outset of the student journey and 'scaffold' increasingly advanced engagement with research and RTL as students progress through their studies. These aspirations are now reflected in UHI's current Learning and Teaching Enhancement Strategy (LTES). This is a values-based strategy developed through consultation with staff and students during the early stages of the RTL project. One of the core values in the strategy is 'Engaging our students as researchers', defined thus: *"We will engage students in research-based activities appropriate to their subject and level of study, including discovery and enquiry based learning. Research-based learning and teaching will become more prominent as students progress throughout levels of study, with an increasing focus on students undertaking research projects that have value for groups, communities and contexts beyond the university."*

One important pedagogic response we have taken in relation to the above is to explore, within programmes, the development of Vertically Integrated Projects (Strachan, Marshall, Murray, Coyle & Sonnenberg-Klein, 2019) that are embedded across all levels of a programme, focused on producing substantial outputs for external use or application, and for which students take on increasing levels of responsibility as they progress through the curriculum. Further practical responses arising through, or influenced by, the RTL project include an increasing alignment of undergraduate dissertation topics to the needs of local businesses and community groups, and establishing an open access repository for dissertations and other final year student research projects as contributions both to societal needs and research more generally.

Relevant broader activities with which our efforts align, or through which they will be informed, include the development of a university framework, and related resources and developmental opportunities, for supporting engagement in educational scholarship and research. The development of this framework for 2021 is one of the implementation objectives within the aforementioned Learning and Teaching Enhancement Strategy, specifically to help embed the value of 'Engaging our students as researchers', and a key dimension of the framework will focus on developing RTL.

From our review of the literature, we are cognisant of the need for institutional wide change in the embedding of RTL to be supported by a strong vision, and clear guiding principles, which are progressive yet also understandable and implementable in practice. While we have momentum within our project, and mechanisms for development are in place, we are also mindful that we do not have a coherent overarching 'vision' or ethos that is identifiable in the same way 'Student as Producer' or the 'Connected Curriculum' is. This is in part a challenge of trying to define a vision for RTL in a geographically, digitally distributed university that is both tertiary in nature (covering FE and HE) and comprised of multiple federated academic partners. It is a challenge to address going forward, with a clearer 'identify' perhaps yet to emerge from our collective efforts.

Next steps

COVID-19 effectively paused the RTL project across 2020, and going forward into 2021, but did provide something of an opportunity to document our progress thus far. In terms of immediate next steps, we will be seeking to further consolidate

our phenomenographic research by synthesising our findings across all of the 'categories of description' within an 'outcome space' that will articulate the relationship between the range of conceptions, perceptions, practices and experiences relating to RTL that our research identified. We will also be supporting participants to investigate the impacts of the RTL practices they were developed and implemented, and will be initiating a further series of professional development initiatives across the university that will allow those out with the project to engage in thinking about enhancing RTL in their own contexts. In due course, these activities will also support engagement with the aforementioned 'RTL Toolkit'.

Our second phenomenographic study, to determine the conceptions and approaches to RTL that are evident following engagement with the RTL project, will be conducted in late 2021/early 2022 and subsequently disseminated. Going forward we will also be disseminating our findings relating specifically to RTL within FE teaching and learning practice and provision.

Conclusion and recommendations

Through the activities reported herein we are seeking to lay the foundations for wide-reaching and long-term change in RTL at our university. Within our work to further understand and more widely embed RTL we have undertaken an extensive review of the field which has grounded our own efforts, but which we also anticipate will be of use to other academics, educational leaders, and researchers who are interested in or beginning to negotiate the field of RTL. Our own research and findings have also underlined the usefulness of phenomenography as an approach to exploring and understanding how the academics participating think about, understand, and enact RTL in their own contexts. Our work also led us to identify practical steps and interventions that are now supporting us in progressing RTL at our university, and from these we identify the following specific recommendations for others seeking to enhance RTL at institutional, faculty or departmental level:

- While academics' may understand or perceive the broad nature and many of the benefits associated with RTL, the reality is that practice may be clustered around research-informed aspects of teaching and learning, extending beyond this mainly in relation to engaging students in research methods and undertaken dissertations
- Supporting staff to move beyond the above position, and to embrace what more advanced or sophisticated approaches to RTL might offer their students and external knowledge beneficiaries, requires efforts to 'demystify' the theory and language of RTL through tangible, relatable examples and exemplars
- Developing RTL in any substantial and meaningful way requires a significant endeavor in redesigning learning and teaching, and the curricula itself. It should therefore be approached and supported as a structured, longitudinal educational change initiative with appropriate professional development and peer support provision
- Embedding the language and ideas of RTL in the wider policies and processes of the institution, and finding practical ways to enact RTL, is an important element of ensuring wider and ongoing awareness and development out with and beyond the end of a specific RTL development project or initiative. For us a commitment to and embedding of RTL in our institutional learning and teaching strategy, and associated developments, have been important. So too have been emerging developments to link final year student research topics to external needs.

We hope our findings and key recommendations will be of value to the thinking of others and, when the longitudinal phenomenographic research is completed in full, provide a further useful contribution to the existing phenomenographic research relating to RTL. The findings of our research relate to the conceptions, perceptions and experiences of RTL amongst the academics who came forward to participate in the project. They are therefore not reflective of everything that is happening at the university with respect to more advanced RTL practices that align with the concept of the curriculum as praxis. We do believe, however, that the conceptions of and challenges relating to the development and practice of RTL that our research uncovered likely reflect the prevailing ones that will need to be addressed in our university, and in other institutions who are seeking to engage a greater number of staff in establishing an embedded culture of RTL.

Biographies

Michael Rayner is Professor of Higher Education and Dean of Research, University of the Highlands and Islands. He provides leadership for the development and extension of research excellence and culture, and is also responsible for the Graduate School.

Keith Smyth is Professor of Pedagogy and Head of the Learning and Teaching Academy at the University of the Highlands and Islands. Keith works across UHI leading learning and teaching enhancement initiatives and developing educational research.

Heather Fotheringham is Evidence-based Enhancement Lead for the University of the Highlands and Islands, based in the Learning and Teaching Academy. Heather leads initiatives that link data and scholarship to educational development.

References

- Adedokun, O. & Burgess, W. (2011). Uncovering students' preconceptions of undergraduate research experiences'. *Journal of STEM Education* 12, 12-22.
- Akerlind, G.S. (2004). A new dimension to understanding university teaching. *Teaching in Higher Education*, 9(3), 363-375.

- Amsler, S. & Canaan, J. (2008). Whither critical pedagogy in the neo-liberal university today? Two UK practitioners' reflections on constraints and possibilities' *Enhancing Learning in the Social Sciences*, 1(2), 1-31
- Bazeley, P. (2010). Conceptualising research performance. *Studies in Higher Education*, 35(8), 889-903.
<https://doi.org/10.1080/03075070903348404>
- Blackmore, P. & Cousin, G. (2003). Linking teaching and research through research-based learning. *Educational Developments*, 4(4), 24-7.
- Boyer Commission on Educating Undergraduates in the Research University (1998) *Reinventing undergraduate education: a blueprint for America's research universities*. Stony Brook: State University of New York at Stony Brook.
- Brew, A. (2001). Conceptions of research: a phenomenographic study. *Studies in Higher Education*, 26(3), 271-285.
- Brew, A. (2006). *Research and teaching: Beyond the divide*. London: Palgrave MacMillan
- Brew, A. & Boud, D. (1995) Teaching and research: Establishing the vital link with learning. *Higher Education*, 29(3), 261-273.
<https://doi.org/10.1007/BF01384493>
- Buckley, C. (2011). Student and staff perceptions of the research-teaching nexus. *Innovations in Education and Teaching International*, 48(3), 313-322. <https://doi.org/10.1080/14703297.2011.593707>
- Centra, J. (1983), Research productivity and teaching effectiveness. *Research in Higher Education*, 18(4), 379-389.
<https://doi.org/10.1007/BF00974804>
- Cheesman, K. (2015). Two sides of the coin: how a departmental culture of inquiry teaching and undergraduate research go hand in hand. In S. Latourelle (Ed.) *Innovations in College Science Teaching* (pp. 49-63). Society for College Science Teachers. Retrieved from http://www.scst.org/wp-content/uploads/2013/10/scst_monograph_2015.pdf
- Dupin, C.M., Larsson M., Dariel, O., Debout, C. & Rothan-Tondeur M. (2015). Conceptions of learning research: variations amongst French and Swedish nurses. A phenomenographic study. *Nurse Education Today*, 35(1), 73-79. <https://doi.org/10.1016/j.nedt.2014.06.003>
- Elken, M. & Wollscheid, S. (2016). *The relationship between research and education: typologies and indicators A literature review*. Oslo: Nordic Institute for Studies in Innovation, Research and Education (NIFU).
- Elton, L. (2001). Research and teaching: Conditions for a positive link. *Teaching in Higher Education*, 6(1), 43-56.
<https://doi.org/10.1080/13562510020029590>
- Feldman, K. (1987). Research productivity and scholarly accomplishment of college teachers as related to their instructional effectiveness: a review and exploration. *Research in Higher Education*, 26(3), 227-298. <https://doi.org/10.1007/BF00992241>
- Freeman S., Eddy S., McDonough M., Smith M., Okoroafor N., Jordt H., & Wenderoth M. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Science USA*, 111(23), 8410-8415.
<https://doi.org/10.1073/pnas.1319030111>
- Freire, P. (1970). *The Pedagogy of the Oppressed*, London: Penguin
- Fung, D. (2017). *A Connected Curriculum for Higher Education*. London: UCL Press. Retrieved from <http://www.ucl.ac.uk/ucl-press/browse-books/a-connected-curriculum-for-higher-education>.
- Galbraith, C. & Merrill, G. (2012). Faculty research productivity and standardised student learning outcomes in a University teaching environment: A Bayesian analysis of relationships. *Studies in Higher Education*, 37(4), 469-480.
<https://doi.org/10.1080/03075079.2010.523782>
- Hajdarpasic, A., Brew, A. & Popenici, S. (2015). The contribution of academics' engagement in research to undergraduate education. *Studies in Higher Education*, 40(4), 644-657. <https://doi.org/10.1080/03075079.2013.842215>
- Hall, R. and Smyth, K. (2016). Dismantling the Curriculum in Higher Education. *Open Library of Humanities*, 2(1). Retrieved from: <http://doi.org/10.16995/olh.66>
- Hattie, J. & Marsh, H. W. (1996). The relationship between research and teaching: A meta-analysis. *Review of Educational Research*, 66(4), 507-542. <https://doi.org/10.3102/00346543066004507>
- Healey, M. (2005). Linking research and teaching exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Ed.) *Reshaping the university: new relationships between research, scholarship and teaching* (pp. 30-42). Maidenhead: McGraw-Hill/Open University Press.
- Healey, M. & Jenkins, A. (2006). Strengthening the teaching-research linkage in undergraduate courses and programs. In C. Kreber (Ed.) *Exploring research-based teaching. New directions for teaching and learning*, 107, 45-55.
- Healey, M. (2009). *Developing Undergraduate Research and Inquiry*. York: Higher Education Academy
- Healey, M., Jordan, F., Pell, B. & Short, C. (2010). The research-teaching nexus: A case study of students' awareness, experiences and perceptions of research. *Innovation in Education and Training International*, 47(2), 235-246.
<https://doi.org/10.1080/14703291003718968>
- Humboldt, W. von (1810). Über die innere und äußere Organisation der höheren wissenschaftlichen Anstalten in Berlin. In H. Weinstock (Ed.) (1957) *Wilhelm von Humboldt* (pp. 126-134). Frankfurt: Fischer Bücherei.
- Jenkins, A., Blackman, T., Lindsay, R. & Paton-Saltzberg, R. (1998). Teaching and research: student perspectives and policy implications. *Studies in Higher Education*, 23, 127-142. <https://doi.org/10.1080/03075079812331380344>
- Johnston, B., MacNeill, S. and Smyth, K. (2019). *Conceptualising the Digital University: The intersection of policy, pedagogy and practice*. Switzerland: Palgrave MacMillan.
- Joseph-Richard, P. & Tansy Jessop (2020). A phenomenographic study of research informed teaching through the eyes of Masters' students, *Studies in Higher Education*, 45(4), 847-861. <https://doi.org/10.1080/03075079.2018.1554640>
- Kawulich, B., Garner, M.W.J. & Wagner, C. (2009) Students' conceptions - and misconceptions - of social research. *Qualitative Sociology Review*, 1(3), 5-25. Retrieved from: <http://www.qualitativesociologyreview.org/ENG/Volume14/abstracts.php>
- Kyvik, S. (2013). The academic researcher role: Enhancing expectations and improved performance. *Higher Education*, 65(4), 525-538. Retrieved from <http://www.jstor.org/stable/23470836>

- Larsson, M., Mårtensson, K., Price, L., & Roxå, T. (2020) Constructive friction? Charting the relation between educational research and the scholarship of teaching and learning. *Teaching & Learning Inquiry*, 8(1), 61-75. Retrieved from: <https://doi.org/10.20343/teachlearninqu.8.1.5>.
- Levy, P. & Petrusis, R. (2012). How do first-year university students experience inquiry and research, and what are the implications for the practice of inquiry-based learning?. *Studies in Higher Education*, 37(1), 85-101. <https://doi.org/10.1080/03075079.2010.499166>
- Lindsay, R., Breen, R. & Jenkins, A. (2002). Academic research and teaching quality: the views of undergraduate and postgraduate students. *Studies in Higher Education*, 27(3), 309-327. <https://doi.org/10.1080/03075070220000699>
- Malcolm, M. (2014). A critical evaluation of recent progress in understanding the role of the research-teaching link in higher education. *Higher Education*, 67(3), 289-301. <https://doi.org/10.1007/s10734-013-9650-8>
- Martin, E., Trigwell, K., Prosser, M. & Ramsden, P. (2003). Variation in the experience of leadership of teaching in Higher Education. *Studies in Higher Education*, 28(3), 247-259.
- Marion, F. (1994). Phenomenography. In T. Husen & N. Postlethwaite (Eds.) *International Encyclopaedia of Education*, (pp. 4424-4429). Pergamon.
- Marion, F., Hounsell, D. & Entwistle, N., (Eds.) (2005). *The Experience of Learning: Implications for teaching and studying in higher education* (3rd edition). University of Edinburgh, Centre for Teaching, Learning and Assessment. Retrieved from: <https://www.ed.ac.uk/institute-academic-development/learning-teaching/research/experience-of-learning>
- McNay, I. (2006). Delivering mass Higher Education - The reality of policy in practice. In I. McNay (Ed.) *Beyond Mass Higher Education* (pp. 1-14). Maidenhead: SRHE and Open University Press
- NCIHE (National Committee of Inquiry into Higher Education) (1997). *Higher education in the learning society*. Report of the National Committee of Inquiry into Higher Education: The Dearing Report. London: HMSO. Retrieved from <http://www.educationengland.org.uk/documents/dearing1997/dearing1997.html>
- Neary, M. (2010). Student as Producer: A Pedagogy for the Avant-Garde; Or, How Do Revolutionary Teachers Teach? *Learning Exchange*, 1(1). Retrieved from <http://eprints.lincoln.ac.uk/4186/>
- Neary, M., Saunders, G., Hagyard, A., & Derrico, D. (2014). *Student as Producer: research-engaged teaching, an institutional strategy*. York: Higher Education Academy. Retrieved from https://www.heacademy.ac.uk/system/files/hub/download/lincoln_ntfs_2010_project_final_report_fv.pdf
- Neary, M. & Winn, J. (2009). The student as producer: Reinventing the student experience in higher education. In L. Bell, H. Stevenson & M. Neary (Eds.) *The future of higher education: Policy, pedagogy and the student experience* (pp. 126-138). New York: Continuum
- Neumann, R. (1992). Perceptions of the research-teaching nexus: a framework for analysis. *Higher Education*, 23(2), 159-171. <https://doi.org/10.1007/BF00143643>
- Neumann, R. (1994). The Teaching-Research Nexus: Applying a Framework to University Students' Learning Experiences. *European Journal of Education*, 29(3), 323-338. <http://doi.org/10.2307/1503744>
- Ozay, S. (2012), The dimensions of research in undergraduate learning. *Teaching in Higher Education*, 17(4), 453-464. <http://doi.org/10.1080/13562517.2011.641009>
- Pascarella, E.T. & Terenzini, P.T. (2005). *How college affects students (Volume 2): a third decade of research*. San Francisco: Jossey-Bass
- Ramsden, P. & Moses, I. (1992). Associations between research and teaching in Australian higher education. *Higher Education*, 23(3), 273-295. <https://doi.org/10.1007/BF00145017>
- Rikowski, G. (2006). *Caught in the storm of capital: Teacher professionalism, managerialism and neoliberalism in schools*. A paper prepared for Education, Culture & Society (EDU3004) Students, School of Education, University of Northampton. Retrieved from <http://www.flowideas.co.uk/?page=articles&sub=Caught%20in%20the%20Storm%20of%20Capital>
- Robertson, J. & Bond, C.H. (2001). Experiences of the relation between teaching and research: what do academics value? *Higher Education Research and Development*, 20(1), 5-19. <https://doi.org/10.1080/07924360120043612>
- Smeby, J. (1998) 'Knowledge Production and Knowledge Transmission. The interaction between research and teaching at universities'. *Teaching in Higher Education* 3(1), 5-20. <https://doi.org/10.1080/1356215980030101>
- Spronken-Smith, R., Walker, R., O'Steen, W., Matthews, H., Batchelor, J. & Angelo, T. (2008). *Reconceptualising inquiry-based learning: Synthesis of findings*. Wellington, NZ: Ako Aotearoa, The National Centre for Tertiary Teaching Excellence. Retrieved from <https://ako.aotearoa.ac.nz/project/inquiry-based-learning/resources/books/synthesis-findings>
- Stanton, A., Taylor, R. & Stanaland, A. (2009). An examination of the relationship between research attitudes and behaviors of business school faculty. *Academy of Educational Leadership Journal*, 13(3), 37-49.
- Strachan, S.M., Marshall, S., Murray, P., Coyle, E.J. & Sonnenberg-Klein, J. (2019). Using Vertically Integrated Projects to embed research-based education for sustainable development in undergraduate curricula. *International Journal of Sustainability in Higher Education*, 20(8), 1313-1328. <https://doi.org/10.1108/IJSHE-10-2018-0198>
- Trigwell, K., Prosser, M. & Taylor, P. (1994). Qualitative differences in approaches to teaching first year university science. *Higher Education*, 27, 75-84.
- Trigwell, K., Prosser, M. & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education*, 37, 57-70.
- Turner, N., Wuetherick, B. & Healey, M. (2008). International perspectives on student perceptions of research: the role of academic development in implementing research-based teaching and learning in higher education. *International Journal for Academic Development*, 13(3), 161-173
- Various (1988) *The Magna Charta of the European Universities*. Retrieved from <http://www.magna-charta.org>
- Vygotsky, L. (1986) (A. Kozulin, Ed.). *Thought and Language*. Cambridge: MIT Press
- Wood, J. (2010). *Inquiry-based learning in the arts: A Meta-analytical Study*. CILASS (Centre for Inquiry-based Learning in the Arts and Social Sciences): University of Sheffield. Retrieved from <https://core.ac.uk/reader/17353070>

Zamorski, B. (2000). *Research-led teaching and learning in Higher Education*. Norwich: Centre for Applied Research in Education