Lessons and Lacunae? Practitioners' suggestions for developing research-rich teaching and learning: Angles on innovation and change

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Abstract

This article explores a universal issue in higher education: how in practice can we secure the most productive relationships between the research universities pursue and the education they provide? It opens by drawing from three recent international literature reviews summarising research on research-teaching links, sometimes termed a 'nexus'. It then proceeds inductively to analyse grounded empirical data from practitioners in an English post-1992 University. This data describes **what** participants think should change and **where**, to increase its amount and quality. To illuminate **how** things might change, the same data is then re-analysed deductively against six 'lessons learnt' from a 2012 review of literature examining the diffusion of innovative teaching and learning in higher education. Lessons are confirmed or lacunae pointed out, before the concluding discussion offers recommendations and observations for universities pursuing research-rich education.

Keywords: Research-teaching links; curriculum, learning and staff development; change management; innovation; literature review; leadership and management

Local and international context

This article's author holds a research fellowship investigating research-rich education in a post-1992 English University of approximately 25,000 students, currently positioned towards the middle of most higher education league tables. Although some of its ten Schools produce 'excellent' research as judged by the UK's research evaluation framework, the university sees itself as equally dedicated to teaching: it recruits students from markedly diverse ethnic and social backgrounds, who after graduation attain statistically excellent longitudinal career outcomes.

This research fellow's appointment at one level therefore embodies a fairly typical UK university's pragmatic attempt to develop fruitful relationships, between two key functions: improving education, whilst pursuing research. At another it reflects the ubiquitous, perennial nature of that challenge, as discussed in three recent and far-ranging literature reviews. These reviews all outline limited success for the multiple attempts theoretically to define, and practically to embed, research-teaching links. The widest review found:

> No simple and consistent linkage between research and teaching … where such a link does exist, it may be found in varied and complex ways, and where it does not, it may require considerable efforts to generate and maintain. (Tight, 2016, p. 9)

For a second, Norwegian-based team's review 'literature in this area is inconclusive.' Individual academics typically assumed linkages yet 'multiple studies show no relationship.

For the research-teaching link, the evidence can be characterised as ambiguous.' (Elken & Wollscheid, 2016, pp. 7-8) Some research literature linking undergraduate learning to research 'similar to the literature on teaching and research', also displayed 'a normative assumption of value added, rather than deconstructing the mechanisms through which such value is added.' (p. 28)

Prime mechanisms for 'adding such value' are teaching and curriculum design. A third review acknowledged how recent research had established 'by extensive example the research-teaching link as a pedagogic choice', whilst critically observing that 'We have not yet conclusively, even contingently, answered the questions asked decades earlier, as to whether a research-teaching link is comprehensively both core and causal to higher education.' (Malcolm, 2014, p. 296) Although multiple recent 'mappings of practice' (p. 293 e.g. Healey & Jenkins, 2009) encouraged significant worthwhile change, the reviewer contended that a 'scientific demonstration of the link between *good* research and *good* teaching' appeared no closer in 2013 than 40 years earlier (Malcolm, p. 290).

Such literature reviews suggest erratic research progress into this 'most resilient and popular foundation stone of the higher education endeavour' (Tight, 2016, p. 2). Research difficulties in this field include terminological uncertainties and conceptual complexities, obscured by the apparent simplicity of terms like 'teaching' and 'research'; over-simplified divides between different methodologies used to investigate their relationship; differing starting values for higher education's aims; and the diverse nations, institutions, disciplines and cultures that explorations of productive higher educational research-teaching relationships must span, even to approach a 'scientific demonstration of the link' (Malcolm, 2014, p. 290).

Similarly generic obstacles hinder potential changes, in the practice of this relationship. For example in most European universities 'the patterns for organising education and research … differ from each other' (Elken & Wollscheid, 2016, p. 40; Fung, Besters-Dilger & van der Vaart, 2017, pp. 12-17). Universities typically value academics' research over teaching, as indicators through which to judge career advancement and institutional prestige (Fung et al, 2017; Gibbs 2014; Tight 2016). For individual academics attempting excellence in both 'the demands of research and teaching can be divergent rather than complementary' (Weller, 2016,

p. 96). Research literature may have paid 'insufficient attention … to conflicts associated with linking the two activities' (Pan, Cotton & Murray, 2014, p. 3).

Studies of educational change in an Australian university (Brew & Mantai, 2017) and across three higher education institutions in New Zealand (Spronken-Smith, Walker, Batchelor, O'Steen & Angelo, 2011) articulated some broader constraints academics retrospectively experienced, whilst introducing more research and inquiry into undergraduates' learning. These included institutional and individual attitudes, cultures, leadership and management; lack of or misplaced resources; and students' and teachers' educational skills and mind sets. The empirical data in this article attempts something different, by looking forward: analysing 46 experienced higher educators' attempts prospectively to imagine future changes, to improve research-teaching-learning links.

Their suggestions were analysed into initial categories (Angle 1 below) then re-analysed using a literature review's lessons around higher educational change and 'the diffusion of innovative teaching and learning' (Smith, 2012; Angle 2 below). This re-analysis was designed to assist the author more objectively to contextualise this particular dataset; and perhaps better to resist 'emotional baggage associated with the research/teaching nexus appeals to traditions and myths, as well as the contemporary idealizations of what might be possible or desirable.' (Tight, 2016, p. 13) Such assistance is necessary not just because research-teaching relationships defy formulaic analysis: but because the integration of research and teaching 'cannot simply rest at the level of a few leading people changing their practice nor at attempts to proselytize new approaches to others. A key challenge for faculties and departments is how to move practice forward.' (Brew, 2006a, p. 20)

The underlying empirical data

A survey's participants were open-endedly asked 'drawing from your experience are there changes you can imagine that might increase the amount and quality of research rich and informed teaching and learning happening at our University?'

Respondents' professional roles and backgrounds

One hundred and fourteen permanent members of academic staff were invited to participate, as members of six different groups. These groups were targeted as likely to have broad educational experience to draw from, and to be interested in participation. This recruitment strategy worked and 51 (45%) responded.

Group 1 was the 'educational research network' (ERN, 30 individuals, 59% of respondents). This recently-formed university-wide voluntary network shared interests in supporting, doing or learning from educational research. Members were mostly academic staff from across ten Schools and other business units, holding teaching and other roles including: professors, deans, department heads or deputies, managers, programme leaders, principal, senior and other lecturers, educational technology developers, information managers and researchers.

Group 2 totalled 13 associate deans (of whom two were professors): four for academic quality assurance (ADAQA), five for learning and teaching (ADLT) and four for research (ADR). These pivotal academic leadership and management roles promote change and innovation within and across Schools.

Group 3 comprised six 'learning and teaching specialists' (L&TS) from the university's academic development team; and two out of six university inter-disciplinary 'research theme champions' (RTCs).

Some underlying attitudes towards and experience of *research rich education's* potential, were tested by posing three closed introductory questions. Their answers placed each respondent on a five point scale of self-perception measuring:

1. **Enthusiasm for linking teaching and research**: 61% described themselves as 'extremely enthusiastic' and 33% as 'very enthusiastic', with only 6% self-identifying as 'moderately or slightly enthusiastic'. Nobody reported feeling 'not at all enthusiastic'.
2. **Experience of linking teaching and research**: 64% perceived themselves as 'very' or 'extremely experienced' and another 24% as 'moderately experienced'. The remaining 12% were 'slightly experienced'. Nobody identified as 'not at all experienced'.
3. The extent to which participants agreed with the statement **'Undergraduates and trainee professionals need more opportunities to learn about and through research'**: 70% 'strongly agreed', 20% 'agreed', 8% were 'undecided' and 2% 'disagreed or strongly disagreed'.

Methodological approach and data analysis

Over four decades ago Stenhouse offered a working definition of educational research as 'systematic inquiry made public' (1978, p.1). His vision was for teachers to approach:

> Educational action as hypothetical and experimental. Researchers on this view should disseminate to teachers a scepticism about research results and theories and hence a disposition to test them … Research guides action by generating action research. (pp. 10-11)

The pragmatic philosopher and educational advocate John Dewey foreshadowed such thinking four decades before Stenhouse (e.g. Harkavy & Puckett, 2014, pp. 253-7). 'For Dewey in particular, inquiry is a way of life – it is our way of being in the world.' (Stark, 2014, p. 89)

Inquiring, pragmatic scepticism seemed a useful methodological foundation for this project; particularly given its brief to investigate educational uses of research and inquiry, with university academics themselves undertaking heterogeneous, multi-disciplinary research. Another foundation resembled Dewey's hope of communal 'improvement … created by the active engagement of reflective citizens' (p. 91). The notion that faculty-student partnerships form a cornerstone of 'bringing research and teaching together' (Brew, 2006b, p. 21) is both attractive, and needs testing. Staff-student partnership-led approaches are already being explored in the researcher's institution (Dickerson, Jarvis & Stockwell, 2016). The research in this article could be viewed as accompanying that 'through a process of acting and observing in the research site, and then evaluating and making sense of the results towards a given goal.' (Stark, 2014, p. 89) Indeed 'given goals' emerged, from colleagues' data below.

Angle 1: What might change, and where?

The data imagined changes better to link research, teaching and learning, offered by 46 experienced practitioners and educators. Twenty-eight answers appeared composite; the other 18 contained 2-5 different suggestions. Through iterative sifting those 18 answers were sub-divided into 54 different statements, then added back to the 28 composite statements. The collected 82 statements, unedited and in their original wording, were then iteratively classified and re-classified using an analytically inductive approach (Preissle, 2008, pp. 15-16) to create emergent thematic categories. This process resembled 'open coding' in grounded theory (e.g. Thornberg & Charmaz, 2012, pp.44-45) or 'coding' in thematic analysis (e.g. Winston, 2012, p. 129). Five categories emerged, some with sub-categories, as summarised in Table 1.

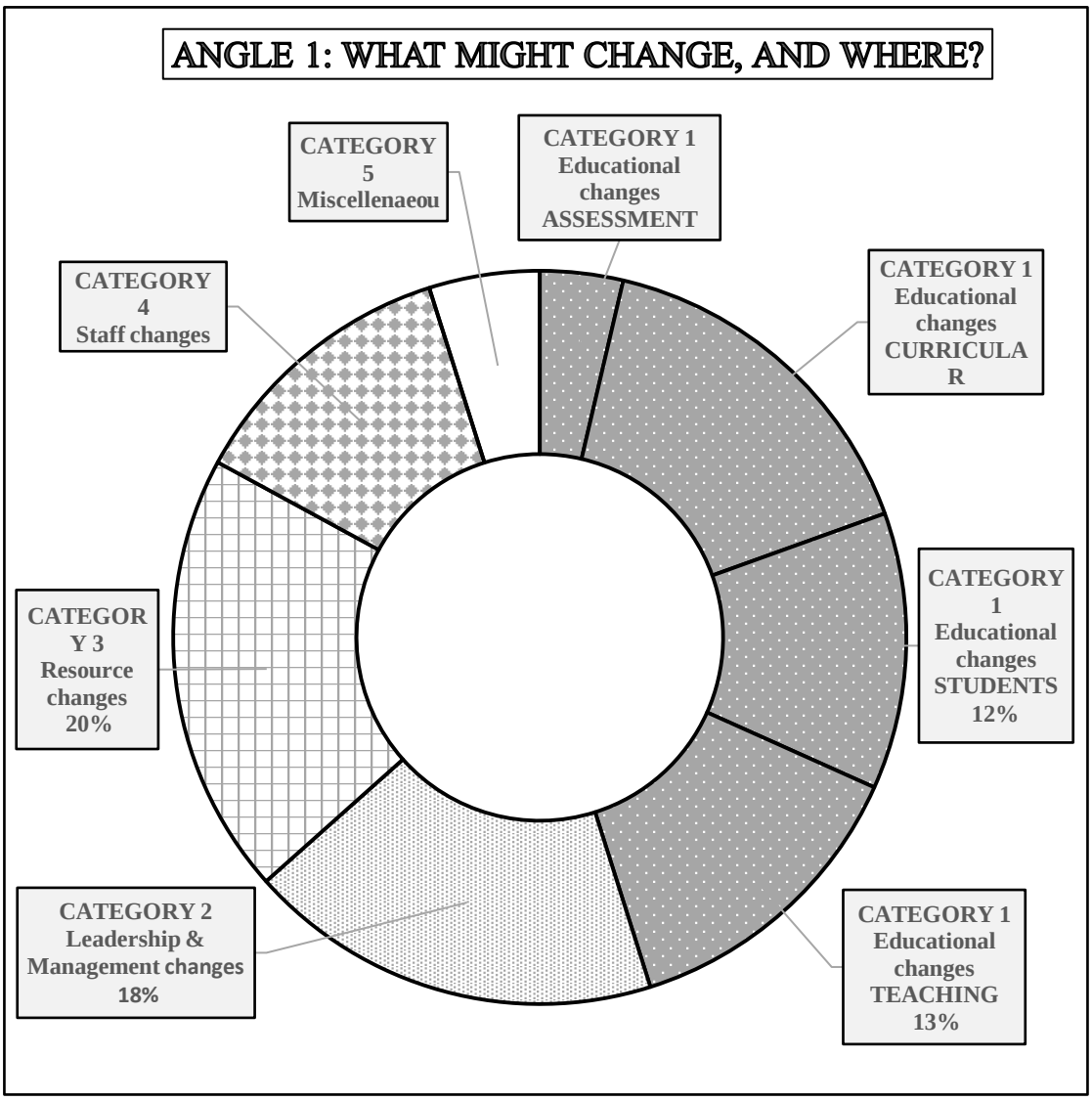

Table 1: ANGLE 1: What might change, and where? Data categorised inductively

Category 1's educational changes contained 37 statements, sub-divided with examples below:

- Assessment (3) *'different thinking about the curriculum and assessment'* (ERN8)
- Curriculum (13) *'development of research and inquiry skills over the lifetime of a programme'* (ERN21)
- Students (10) '*we need to prepare students during their first semester to appreciate the value that research can bring to all levels of work including their assignments'* (ERN16)

- Teaching (11) *'possibly clearer outcomes in teaching and more focus on the process and benefits of research itself as opposed to it being a means to an end*' (ERN14)

Category 2 management and leadership contained 15 statements such as:

- 'w*e need to secure a commitment to this and create a more research rich and informed teaching culture'* (ERN30)

Category 3 resources contained 16 statements, sometimes associated with changes imagined in the previous category:

- *'hire research active staff with appropriate qualifications e.g. at doctoral level, or qualified professionals for professional degrees'* (ADR2)
- *'In my view the best research institutions do not have researchers weighed down with heavy teaching loads'* (ERN5)

Category 4 staff knowledge and development contained 10 statements for example:

- *'a focus on exploring own practice and educational issues in pairs or groups'* (ADLT4)
- *'the envisaged plan for ongoing professional teacher development will help'* (L&TS3)

Category 5 miscellaneous comprised 4 statements:

- '*As I am not familiar enough with teaching practices I don't think I am able to answer this question'* (ERN29)

Although 78 of the 82 statements offered specific and often concrete changes many also, and without being asked, suggested how such changes might happen. Several analytic attempts systematically to categorise or summarise those change process suggestions, by further inductive analysis, proved fruitless. To break that impasse deductive analysis was

therefore attempted, through the experimental application of an external conceptual framework derived from a recent literature review around innovation in higher education.

Angle 2: How might changes happen?

The survey's question about imagined changes, although requesting responses *'drawing from their experience'* was deliberately descriptive and avoided asking participants how changes might happen. Angle 1 classified that data. Angle 2 on the other hand, prompted by many statements' unsolicited references to change processes, explored what those participants added about *how* changes could occur. This process started by *deductively* sorting the same 82 statements, from 46 participants, through the experimental application of six external 'lessons learnt' about change. These lessons derived from a literature review of 89 academic papers analysing the diffusion of innovative teaching and learning in higher education (Smith, 2012).

For individual data the categorisation process matched analysis in Angle1 (see p. 8): heuristic and iterative sifting, classifying and reclassifying, testing the extent to which a congruent fit could be achieved between individuals' statements and the six imported categories. This process, akin to template analysis (Brooks & King, 2012) resulted in:

- Fifty-five statements (68%) fitting one of Smith's six existing 'lessons learnt'.
- Forty-five of these (55% of the overall total) actively introduced notions of how change might happen, rather than merely describing what might change (Lessons 1-6 below).
- Seven statements (8%) did the same, whilst introducing change elements not obvious in Smith's six categories (Lacunae 1 and 2 below).
- Sixteen statements (19%) simply described 'an imagined change' without reference to processes through which change might happen (Lacuna 3 below).
- Four statements (5% as in Angle 1) persisted as miscellaneous.

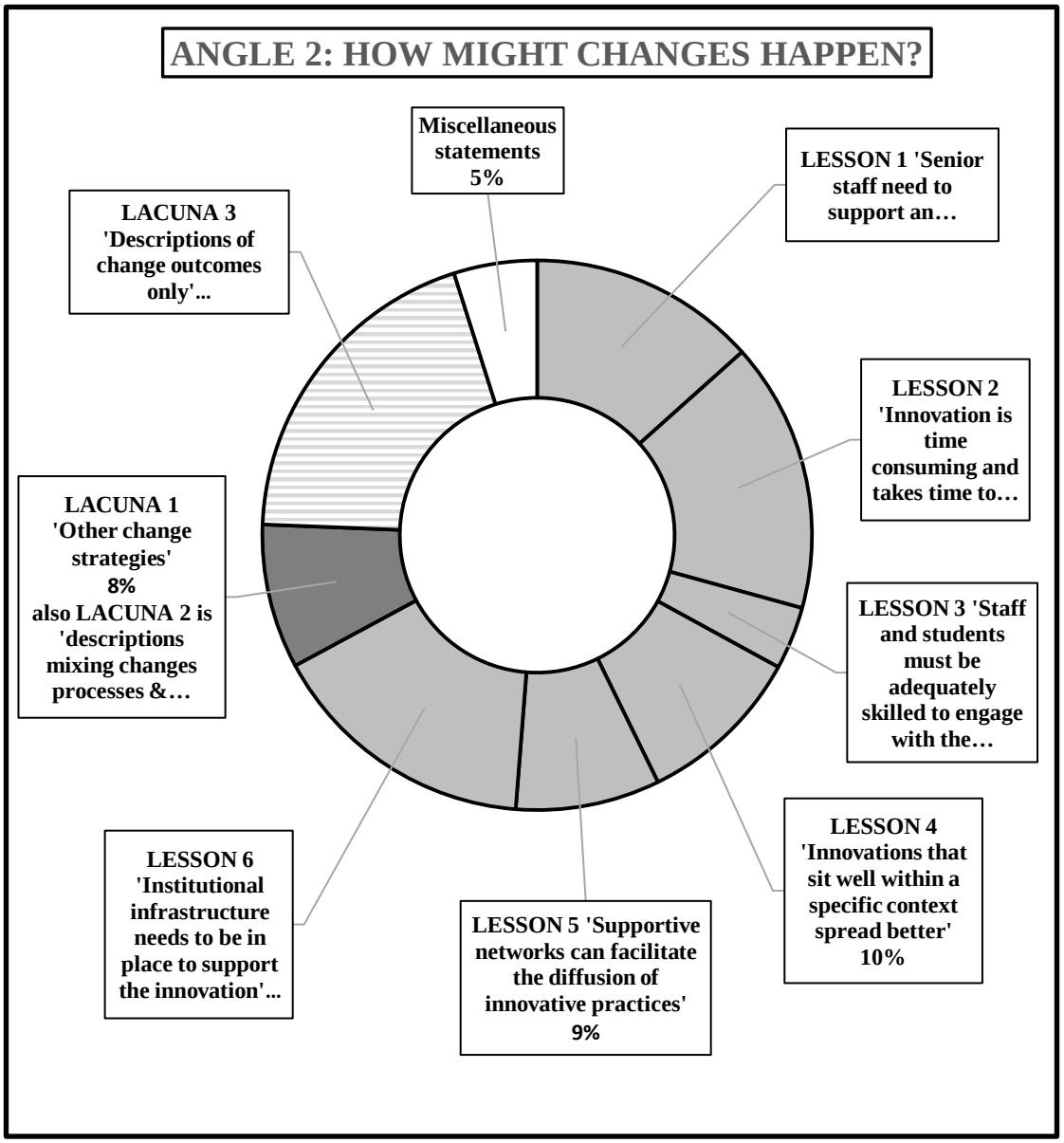

Table 2: ANGLE 2: How might changes happen? Data categorised deductively using 'six lessons learnt' (Smith, 2012)

Illustrative examples lessons 1-6

Numerous statements reflected Smith's (2012) 'Lesson 1 Senior staff need to support an innovation for it to spread effectively.' Visionary senior leadership underpins, for example, encouraging staff to *'think innovatively about alternative forms of assessment'* (L&TS1) or consider *'a whole new approach to curriculum … no modules - programme based'* (ERN17). Only senior staff perhaps can bring about strategic policies for 'e*nhanced recognition and reward for research rich teaching'* (ERN19), to secure '*more recognition for pedagogic*

research' (ERN21) or maintain *'an upward trajectory in staff being PhD qualified and research active'* (ADR1).

'Lesson 2 Innovation is time consuming and takes time to embed' was also mirrored in many statements. Participants considered time as central to increasing lecturers' research by for example: '*enabling staff with time to develop their own research interests'* (ADR4), *'more time for staff to engage in research that they subsequently teach'* (ERN21), requesting a *'reduced teaching workload' (ERN4)* or *'sadly … less teaching to allow space for the research'* (ADAQA1).

The boundaries between Lessons 3-5 were less distinct, both in the literature review and also when applied to individual pieces of data from this study. Into 'Lesson 3 Staff and students must be adequately skilled to engage with the innovative practice' were allocated *'increasing teacher confidence seems to me important'* (ERN2) and *'CPD opportunities to support staff new to academia/ECRs in implementing research rich teaching'* (ADLT1). Into 'Lesson Learnt 4 Innovations that sit well within a specific context spread better' were allocated *'undergraduate research conferences'* (L&TS5), *'exciting case studies which demonstrate clear benefits and outcomes to students'* (ERN27) and *'distribution of a range of exemplars'* (ADLT2). Yet all three could have as easily been placed in Lesson 3 above, or possibly Lesson 5 below.

Examples of 'Lesson 5 Supportive networks can facilitate the diffusion of innovative practices' included *'enabling more collaborative participation across areas of expertise in module design and assessment would help increase opportunities to [test] evaluate impact of this further'* (ERN1) and *'initial teacher education could use a team approach here'* (ERN26). The literature review specifically mentioned 'having local champions' (Smith, 2012, p. 177),

reflected in the suggestion of a *'champion in each School to raise awareness and expertise in an appropriate way for each discipline'* (ERN10).

Many individual data could more confidently be grouped under 'Lesson 6 Institutional infrastructure needs to be in place to support the innovation.' These included *'the university developing an environment, buildings, spaces that show commitment to research'* (ADR3), *'increasing the number of teaching assistants to reduce teaching load of lecturers'* (ERN25) and *'support for early career researchers'* (ERN22). A sub-heading suggested by the literature reviewer was 'communication' (Smith 2012, 178), against which these data were placed: *'promotion of research to students as part of recruitment, open days and via the students union'* (ADLT5) and *'academic developers need to engage more with staff in terms of research rich and informed teaching'* (ERN30).

Table 2 and the textual examples of categorisation above, suggest that most (68%) of empirical statements seemed clearly to match at least one the six 'lessons from literature'; and many could have been allocated to several. What else does Analysis 2 of the dataset suggest may have been missing, either from where the researcher started his empirical analysis, or the reviewer concluded her overview?

Possible lacunae in this data

Lacuna 1 - Other change strategies

Seven statements in the empirical data described change strategies not easily visible in Smith's 2012 literature review, which are nevertheless potentially powerful tools through which to promote research-teaching-learning links. Three themes emerged:

Curriculum design. *'Yes curriculum design key in driving research rich and informed teaching agenda by supporting student development in this area from first semester'* (ERN 12)

or *'Adoption of integrated resources into VLE, embedding information type literacies into the curriculum'* (ERN6).

Creative use of existing resources. *'As a community we need to think creatively about how these ideas can be scaled up to large groups'* (ADLT3) and '*We need to review our current practices. We ought to explore* this *more at programme review and validation and in peer review'* (ERN30) and *'Utilising researchers more fully in master classes or more guest lectures'* (ADR4).

Creating or responding to demand. *'Student demand for it'* (L&TS2) and *'Something of a self-fulfilling prophecy perhaps … particularly for students it is a culture change, and the more they experience it the more they will engage'* (ERN14).

Lacuna 2 - Descriptions mixing change processes and products

The phenomenon underpinning a second lacuna has been referred to previously and was the researcher's responsibility. When statements allocated to Lessons 1-6 and Lacuna 1 above were combined, simultaneous with describing imagined changes 68% offered (unprompted) comments on processes of change. The researcher had (in retrospect) imported into his research and data an unexamined, false assumption: that when asked to 'imagine changes', respondents would more readily describe products than processes. His simplifying error perhaps mirrored others in the wider research literature on change, which itself:

> Over-simplifies a complex and multi-faceted process … into a generalisable 'set of techniques' … generalised guidance ignores the organisational and discipline specificity at the heart of higher education … (suggesting) an overly rationalistic, mechanical view of organisational change. (Smith, 2012, p. 178)

Distinctions between describing and diffusing change may, for educators immersed in practice, feel arbitrary or even false.

Lacuna 3 – Descriptions of change outcomes only

At the other end of the spectrum lies a converse, third lacuna. At least 16 statements described, as requested, apparently beneficial concrete educational changes, without reference to enabling processes. Examples from this dataset included (with their originator and Angle 1 category in brackets):

- *'I would like to see less short answer exams across the school and more assessments that relate to an examination of evidence.'* (ADAQA3 – assessment)
- *'I wonder also whether we are starting research learning early enough in our courses.'* (ERN2 – curriculum)
- *'More problem-based learning (or research-based learning).'* (L&TS5 – curriculum)
- *'Better understanding of the research skills students already possess.'* (ERN21 – teaching)
- *'Move away from 'traditional' teaching methods.'* (L&TS1 – teaching)
- *'Activities that value intellectual challenge.'* (ADR3 – teaching)

Might leaders of successful change need to take such descriptive change propositions equally as seriously, as the fuller arguments cited in Lacuna 2 above, or in the preceding Illustrative Examples Lessons 1-6?

Concluding discussion

Four recommendations

As expressed in both Angles 1 and 2, from the (generally) experienced and enthusiastic perspective of educators working in a not-untypical English university, four powerful processes of change were recommended better to link research, teaching and learning:

Curriculum development was particularly favoured within the 45% of suggestions focused on educational change; sometimes featuring too alongside suggestions for how *teacher development* was essential to bring about research-rich teaching and learning: *'we need to look at the support we provide curricula developers'* (ERN 30)

Teacher and staff development could be helped by *'Imaginative and successful models of practice being shared and visible'* (L&TS3).

Student involvement could bring in allies or partners in change processes, encapsulated in a plea for *'shifting the culture of student and staff expectations'* (ERN13).

Culture-changing leadership and management making targeted *resource decisions*, was oft-cited: *'One key is more funding for research to include/require an effect upon teaching'* (ADR3) and *'Academic management ensuring that staff have time to think and reflect on the modules, teaching, and literature'* (ERN23).

In addition to such specific recommendations, four observations are offered below. These derive from both the particulars of the empirical data, and their analysis against wider research and development literature.

Four observations

Firstly, when trying to diffuse innovation **leaders in higher education should actively involve practitioners** in articulating potential change products and processes. Not doing so risks provoking unnecessary resistance, and is potentially wasteful of colleagues' creativity and experience. A recent study of large-scale change in higher education argued 'Projects that have successfully embedded and up-scaled have typically identified and engaged with potential adopters from the outset.' (Gannaway, Hinton, Berry & Moore, 2013, p. 416) As long advocated, both research and experience strongly suggest that change to strengthen teaching-

research links should 'start from valuing how faculty see these issues' and 'recognise the particular contexts in which faculty are working.' (Healey & Jenkins, 2006, p.45)

A second counter-balancing observation acknowledges that **leaders and managers are pivotal to enabling innovation**. This article's empirical data and cited literature both suggest that successful change rests on key leaders inspiring others, or enabling colleagues to inspire each other, through visionary professional leadership and cultural change. Practitioners yearn for leaders who can create communal visions and follow them through into practical, everyday decisions that align ideals with for example: financial expenditure, time allocations, student and staff recruitment, retention and motivation, and crucially how teaching and learning are provided and evaluated. In a compelling, Canadian case study of change, a team of educational developers describe how (working with colleagues across boundaries) they developed common 'research-based principles' which served as a 'simple statement of the vision' and were 'essential for engaging multiple layers of the organisation' (Weston, Ferris & Finkelstein, 2017, p. 275). Change succeeded, they argue, because educational and organisational development were inspiringly and carefully aligned.

Thirdly, **generalisations always need testing** against local realties. Fung observes this in a curriculum context 'Ensuring that programmes of study are designed coherently can be a challenge, especially for institutions that use modularised systems … in which students can make very different study choices.' (2017, pp. 55-6) Meanwhile in research terms Angle 2 suggested that around two thirds of a group of local practitioners' statements about change, clearly mirrored themes from Smith's (2012) wide-ranging literature review. Yet Lacuna 1 locally surfaced three other, less visible ways to encourage and diffuse educational change. Lacuna 2 also suggested, contrary to prior assumptions, that in practitioner imaginings of change, processes and products can blur. Generalised policies or 'Lessons from theory' exist

to be tested, rather than accepted (Stenhouse, 1978); a principle that seems especially pertinent for universities, as institutions claiming to be led by research.

A final observation is that mutually enriching relationships between university research, teaching and learning may remain elusive, until university **leaderships publicly value and exemplify through their practice** the innovations necessary to make such relationships work. Some of the literature's disappointed grumblings about slow progress towards stronger 'research-teaching' links reflect systemic disparities between how research and education are valued and resourced: not just by national governments or policies, but by individual universities. The safest remedies are perhaps in local, or networked hands: 'a model which views teaching, learning, research and scholarship as social processes within inclusive scholarly communities' may be particularly powerful.' (Brew, 2006b, p. 36)

Higher educators, as our reviewer of literature on innovation diffusion concluded, therefore need 'to problematize the reality of innovation diffusion through more systematic research into how innovative ideas and practices spread' (Smith, 2012, p. 179). The lessons, lacunae, recommendations and observations from this article, it is hoped, may play a small part in meeting that need.

Disclosures

No potential conflict of interest exists

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