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**Exploring brokerage
activities between
Life Science research
and teaching
communities in UK
Higher Education
Institutions**

Research report or brief

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Executive Summary

Twenty-three academics working in life sciences departments in eight institutions around the UK were interviewed regarding their roles. They were asked about their teaching, their engagement with the Scholarship of Teaching and Learning and disciplinary research. The aim of the interviews was to uncover practices of “brokering” – in this case, activities where there is an exchange of pedagogic and disciplinary expertise between academics whose research expertise is within one or other of those domains. Academics described a number of practices which could be described as brokering. These were described as formal and informal arrangements, which differed between departments and institutions. Teaching-focused and research-focused colleagues spoke of opportunities to contribute to research projects and curriculum redesign, which required their respective expertise. When brokering works well, there is a benefit to the department as a whole. Academics are seen to be valued, irrespective of role. However, there are also situations within departments where teaching-focused academics are not valued equally as research-focused colleagues, leading to frustration and anxiety. The role of the Head of Department (or equivalent leadership role) was seen as vital to the functioning of the department, and support of academics. This role was sometimes in opposition to that of institutional policies and strategy. While this study has uncovered much about brokering and how individuals can be supported to take advantage of opportunities, there is much to be learned about the complexities of teaching in higher education in a research-dominant culture, as the effects of this can be seen for both teaching- and research-focused academics.

Exploring brokerage activities between Life Science research and teaching communities in UK Higher Education Institutions

Introduction

The origin of this study came from observations from previous research on UK Life Sciences teaching-focused academics (Tierney, 2016). One of the major concerns of this group of academics was that over time they were in danger of losing currency in their disciplinary expertise, as they were no longer “research-active” within their discipline. This group of academics was characterised by a high teaching and administration load, and the expectation of “engagement with the Scholarship of Teaching and Learning (SoTL)” as an alternative to disciplinary research. Situated within the research-dominant culture of UK universities, a culture driven by the Research Excellence Framework (REF), this group of academics exists as a consequence of the drive for research excellence via REF, as they release research-focused academics from teaching and administrative roles, in order to carry out research-related activities. Whilst this tactic has undoubtedly favoured disciplinary research within institutions that employ teaching-focused academics, one of the consequences on the individuals involved is an anxiety around keeping disciplinary expertise up to date if one no longer has a laboratory or research group (Gretton & Raine, 2015; Tierney, 2016).

The main research question for the study is:

How can brokering of disciplinary and pedagogic expertise be facilitated and supported between research- and teaching-focused communities in UK Life Science departments?

In this study, the definition of brokering must be examined carefully. Brokering can be defined as the offering of knowledge from one community to another in a collaboration. In this case, members of each community bring their knowledge and expertise to the table, and each contributes their knowledge and expertise. However, I wish to examine brokering relationships beyond the offering of expertise and knowledge and instead look at how members of one community learn the knowledge of the other community. This is the essence of this study, as earlier identified by Life Sciences teaching-focused academics who realised that their disciplinary knowledge and expertise was becoming dated because they were no longer research-active.

The study draws from the results of my previous work (Tierney, 2016) which highlighted the separation of teaching-focused and research-focused academics in Life Sciences into two parallel communities of practice, influenced by the pressure of the Research Excellence Framework. Teaching-focused academics found themselves in that role through a variety of routes; they may have been forced there through reassignment or

redundancy, decreasing research productivity, or accidentally as a result of a family move to another part of the country. Some younger academics made the choice to move into teaching-focused roles because of a rejection of the competitiveness of disciplinary research (Garwood, 2011). Teaching-focused academics are required to engage in the Scholarship of Teaching and Learning, as a contractual obligation and/or a promotion criterion. However, the definition of SoTL within and between institutions may be unclear and promotion may be difficult to achieve (Cashmore, 2009b,2009a). The situation has not improved by much in the past decade, with some institutions failing to keep records of teaching-focused promotions, and a ratio of 50:1 disciplinary/teaching professorial appointments across those institutions who do have figures available (Freestone, 2018). Teaching-focused academics are not initially employed for their teaching or educational research expertise, coming almost exclusively from a traditional postdoctoral fellow/research academic route. They do not come with specialist educational qualifications, instead participating in postgraduate certificates of Higher Education (PGCert) during their appointment. Engagement with the PGCert is generally the first exposure for teaching-focused academics to engage with SoTL and although this may engender an interest in pedagogic research and often becomes a passion for teaching-focused academics, there is no overarching support for them post-PGCert, and they often feel isolated in their endeavours. This is in contrast to the situation in the US where the phenomenon of disciplinary based educational researchers (DBERs) is emerging, who have particular expertise in educational research, often with formal terminal degree qualification. Both the teaching-focused academics and the DBERs engage in dissemination activities including journal paper publication. However, although there is an abundance of pedagogic research material, there is no evidence that research-focused academics incorporate it into their own expertise or pedagogic development. Similarly there is an abundance of disciplinary research literature available to teaching-focused academics. However, availability does not mean that it is being incorporated into the teaching-focused academic's expertise, as they have previously self-identified that it is impossible to keep up with disciplinary literature given teaching and administrative workloads (Tierney, 2016). The purpose of the study, therefore, is not to identify sources of knowledge, as it can be agreed that they exist in abundance. The purpose of the study is to examine if teaching-focused academics have strategies to keep up to date with disciplinary knowledge and expertise, and if research-focused academics have strategies to keep up to date with pedagogic knowledge and expertise.

Situating the study

This study seeks to explore the interactions between teaching-focused and research-focused academics in life sciences departments in UK universities. Life Sciences is a broad term, and includes any discipline which includes Biology, Biochemistry, Biomedical Sciences and Organismal Biology. Teaching-focused academics are defined as

academics whose main duties are teaching and administration, who engage actively with SoTL and conduct pedagogic research, but whose work is not submitted to REF. Research-focused academics also teach, and may have administrative duties, albeit reduced, but in contrast to teaching-focused academics, have work submitted to REF, in their disciplinary Units of Assessment.

The study is influenced by the work of Wenger's (1998) *Communities of Practice*. Previous work (Tierney, 2016) identified teaching-focused academics as a distinct community of practice with SoTL at its heart, in contrast to the research-focused community of practice with disciplinary research at the centre. As such, it was possible that teaching-focused and research-focused academics were capable of initiating brokerage activities across the boundaries of their respective communities, using pedagogic and disciplinary expertise as currency.

Wenger's (1998) work on *Communities of Practice* states that the community in question may be geographically dispersed, as the defining characteristics of a community are 'mutual engagement', 'joint enterprise' and 'shared repertoire' (Wenger, 1998, pp. 72–73), rather than geographical location. This is true of teaching-focused academics, who experience stronger community of practice through the pursuit of external networks (Tierney, 2016, Chapter 4). However, work related to communities of practice by Roxå & Mårtensson (2011) describes 'microcultures of excellence', in which small groups working within an academic department or institution may excel independently of the prevailing culture. Microcultures of excellence within higher education have the following characteristics:

- Striving for excellence in research and teaching
- Collaboration and support of colleagues
- Shared history (saga)
- Shared future
- Strong leadership
- Operating independently of institutional culture (Roxå & Mårtensson, 2011)

Of interest to this study is the importance of teaching within microcultures of excellence, where it is seen as an integral part of the identity of an academic. Trust is also essential, with members of the microculture being able to discuss issues and problems openly, and with an expectation of support. Central to microcultures of excellence is the role of the "Head of Department"; an academic in an identifiable leadership role, who leads the microculture, sets the story and vision of the department and supports staff in their various roles (Roxå & Mårtensson, 2011, p. 26). This is relevant within the UK higher education context, where research is valued above teaching, and teaching-focused academics may feel devalued if support is not visible within a department. It is vital, therefore, that Heads of Department support staff in whichever role they fulfil, in order to allow each individual to work to their potential.

Where departments are not working to their potential, and staff may feel undervalued, there is the potential to intervene and revitalise departmental culture. Prior to the work of Roxå & Mårtensson (2011), similar microcultures of excellence were identified by Cooperrider (1986), working on organisational development at the Cleveland Clinic. Cooperrider noticed pockets of excellence within the organisation, which persisted despite the prevailing organisational culture. Cooperrider's findings are similar to those of Roxå & Mårtensson (2011):

- Collaboration between individuals
- Shared vision of the team
- Strong hierarchy/leadership
- Relationships based on trust

Cooperrider's work is pivotal, however, because, in addition to identifying outperforming groups within organisations, an organisational development model named Appreciative Inquiry was developed which could be used to encourage these behaviours in organisations which are underperforming (Cooperrider & Whitney, 1999; Mohr & Magruder-Watkins, 2002). Therefore, it is possible to change the behaviours and culture of underperforming or dysfunctional departments/institutions, should there be a will to do so. Appreciative Inquiry (AI), the organisational development model which came out of Cooperrider's initial study, works on using a generative model to empower participants. The AI model allows members of an organisation to imagine what their collective potential is, using:

- Discovery: Identify and appreciate what works
- Dream: Imagine what might be
- Design: develop systems, structures leveraging the best of what was and what might be
- Destiny: Implement or deliver the proposed design

Contrary to the perception that AI removes leadership structures, because of its empowering and generative nature, AI relies on strong leadership, through utilisation of sphere of influence. This means that throughout the organisation, people are empowered to delivery to their potential at the level they are able to do that. One of the criticisms of AI is its focus on the positive (Bushe, 2007) at the expense of the generative (Cooperrider & Srivastva, 1987). It is therefore necessary to identify an experienced AI facilitator to support a department or organisation contemplating using AI for organisational change.

Impact of the study

This study was carried out in the context of UK higher education, specifically within Life Sciences. However, the phenomenon of teaching-focused academics is one which is currently relevant globally (Cassuto, 2014; Dean, Harden-Thew, & Thomas, 2017; Gretton & Raine, 2015; Hall, 2015; Hubbard, Gretton, Jones, & Tallents, 2015; Times Higher Education, 2008), with the trend of universities to favour research over teaching, minimising resource spent on teaching, including the employment of adjunct rather than permanent staff to teach. The study highlights the impact on the individual, but also the wider issue of deskilling within the academy, and the failure to acknowledge the expertise brought to higher education by those who seek expertise in both pedagogy and discipline. There is also an opportunity to address the shortcomings of departments in which opportunities are minimal, using appreciative inquiry as a model for change.

This study explores the existence and the extent to which brokerage currently occurs, the direction it occurs in, and what mechanisms would encourage exchanges of expertise and the extent to which members of each community absorbs the knowledge of the other. The study is important as the Teaching Excellence Framework (TEF) (Department for Business, Innovation & Skills, 2016) is being implemented in England, which will turn the spotlight on teaching and learning practices in English universities, and is likely to impact on core funding. The study is not about the accumulation of expertise within the teaching-focused or research-focused community, but about how the teaching-focused community absorbs disciplinary knowledge and vice versa.

Methodology

I have taken a qualitative approach to this study in order to uncover the experiences of academics within higher education, what their roles mean, and how they face the challenges of the role within their local and wider context. Therefore participants are invited to relate their stories, via narrative interviews (Jovchelovitch & Bauer, 2007). While I have a series of core areas to cover, the participant leads the direction of the interview. This results in rich narratives, which often touch on subjects and insights which might otherwise be missed using a more directed approach to interviewing.

Recruitment

Participants were recruited via an email sent to the JISC HEABioPedR mailing list. Those included in the sample population are full time academics on teaching or research contracts. Both teaching-focused and research-focused academics are included in this study as both act as brokers of expertise, disciplinary and pedagogic. Excluded are part time or adjunct staff, postgraduate students and postdoctoral research fellows. However, the response to the request for participants included a number of enquiries from part-time, zero hours lecturers and postdoctoral fellows, who all wanted to contribute to the study, indicating a direction for further study.

Interviews

Participants were contacted via email to arrange a convenient time to be interviewed. Where there was one person in an institution, the interview was carried out over the phone (Novick, 2008; Sturges & Hanrahan, 2004). In the case of more than one person at an institution, I made a site visit and carried out the interviews face to face. Site visits also gave me an opportunity to observe the day to day workings of the department in question, and the interactions between individual academics being interviewed. In total, twenty-three academics from eight institutions were interviewed. Nine male and fourteen female participants took part in the study. Of those, five were research-focused and eighteen were teaching-focused academics, including two equivalent Heads of Department.

Data analysis

Interviews were recorded and transcribed. The transcripts were returned to interviewees, who were asked to verify the content of the transcript and given the opportunity to add or amend what was said. The transcripts were then analysed for common themes, and examples of brokering relationships concerning either pedagogic or disciplinary expertise

were identified. The wider roles of the academics were also examined, as was their value and status within their department and institution.

Findings

Brokerage activities

The interviews provided a rich source of data, which contributes to the understanding of teaching- and research-focused academic staff in Life Sciences departments, their exchange of pedagogic and disciplinary expertise, and where it was absorbed by the other community. Participants identified examples of exchange of knowledge, and there was a range of examples of brokerage activities. Of interest were participants' perceptions of the mechanisms for exchange of knowledge or expertise. When asked to identify if the exchange was informal or formal, participants were more likely to categorise disciplinary exchanges as formal, and pedagogic exchanges as informal. However, examples given show both formal and informal examples for both disciplinary and pedagogic exchanges (Table 1).

Table 1 Pedagogic and disciplinary brokering

Brokering	Informal	Formal
Pedagogic knowledge	Coffee conversations	PG Certificate in teaching and learning Teaching and Learning seminars Programme redesign
Disciplinary knowledge	Contributing expertise for student projects Research student supervision Taking part in a research project	Research seminars Research student supervision Programme redesign Embedding disciplinary research skills into undergraduate programmes

Table 1 shows the range of activities identified by participants. There are two things of note from this table. One is the lack of informal pedagogic opportunities. This could be interpreted as a lack of opportunity or a lack of interest. The second is that the mechanisms for teaching-focused academics to gain up-to-date disciplinary knowledge,

although arranged informally between individuals, could be identified as part of the formal role of an academic.

Brokerage of pedagogic expertise

Participants described mechanisms to exchange pedagogic expertise as being informal. However, the examples they gave included a range of formal activities. The main informal activity was the “coffee conversation”, where teaching-focused academics chatted about teaching. These conversations occasionally included research-focused academics, although this was not common. The lack of participation by research-focused academics means that although the opportunity is offered by the teaching-focused community, pedagogic knowledge is not being absorbed by the research-focused community. Reasons given for this were a perceived lack of interest, and, from research-focused academics themselves, a lack of time to participate.

Both research-focused and teaching-focused academics identified a number of formal activities for gaining pedagogic expertise. The first of these was participation in the postgraduate certificate in higher education (PGCert), which most new academics complete during their first academic post. There was general agreement that this was a useful course to complete, and some teaching-focused academics contributed to the teaching of their institutional version. For research-focused academics, the completion of the PGCert marked the end of their formal pedagogic development. Institutional attitudes towards completion of the PGCert was mixed, with some concern expressed by teaching-focused academics at changes to institutional requirements for completion of the postgraduate certificate by every new academic, resulting in either a reduced PGCert or complete exemption for research-focused staff.

Teaching and learning seminars were also identified as an activity where pedagogic expertise and practice could be discussed and shared. These opportunities were welcomed by teaching-focused staff. However, there was a general perception that the people who turned up to such events were those who usually attended, and that those academics who might benefit from attending, did not attend. Teaching and learning seminars, therefore, were being offered by the teaching-focused community but not being absorbed by the research-focused community to any great extent.

A final example of exchange of pedagogic expertise was that of programme redesign. In this particular example, teaching-focused academics described a process where the entire department took part in a redesign of a large number of degree programmes. Each cognate area was given to a team of four academic – two research-focused and two teaching-focused, who worked together to redesign the undergraduate provision. This was highlighted as being a productive and positive experience. However, as a brokerage activity, this was limited. Each academic contributed their current expertise, pedagogic or disciplinary, and while it was acknowledged that teaching-focused academics would have

to become familiar with the new disciplinary research techniques, there was no reciprocity that research-focused academics become familiar with the pedagogy which underpinned the new programme design. This example begins to shine a light on the asymmetry of disciplinary and pedagogic brokerage, where both communities need to be familiar with disciplinary knowledge, but pedagogic knowledge is left to the teaching-focused community.

Brokerage of disciplinary expertise

As with pedagogic activities, disciplinary brokerage activities were described as formal and informal. Research seminars were seen as a formal way that academics could keep up to date with advances within the discipline. However, teaching-focused academics reported that their workload precluded them from attending as many of these seminars as they would like. Participants also identified research student supervision (teaching-focused academics) and embedding disciplinary techniques and skills (research-focused academics) as ways of keeping disciplinary skills current. Programme redevelopment was also identified as a formal means of contributing expertise. It is here that the asymmetry in exchange, uncovered in the previous section, becomes more visible. Rather than an exchange of pedagogic and disciplinary expertise, where both communities absorb the knowledge of the other, it is a contribution of expertise, with research-focused academics contributing disciplinary knowledge, and teaching-focused academics contributing pedagogic knowledge. This model could be viewed as a multidisciplinary collaboration, rather than a true brokerage activity.

Many of the teaching-focused academics described informal arrangements where they could keep disciplinary expertise current. Despite the informality of the arrangements, the activities themselves were part of the formal activities of the department. These came in two forms: inclusion in a research project and research student project supervision. To be included in a research project, the teaching-focused academic needed to be known within the department for expertise in a particular research technique which was in demand. They were then able to apply their expertise to a range of research projects which took them out of their original area of expertise. This was particularly satisfying for teaching-focused academics who were able to engage in research in this manner. However, opportunities to do so were not common. The advantages for teaching-focused academics were many, and enabled them to become better informed in their teaching, as they were able to keep the currency of their disciplinary expertise by participating in all aspects of the research process, from reviewing and contributing to grant bids, to publication of results.

Inclusion in a research student project was viewed as an informal or formal activity, depending on institution. However, the benefits to teaching-focused academics were similar to those of being included in a research project. Individuals kept their disciplinary

knowledge up to date as they read papers in advance of supervisory meetings, and were involved in all aspects of supervision and writing. It should be noted that in at least one of the participating institutions, teaching-focused academics were not allowed to be postgraduate supervisors without permission, even in cases where they had past records of successful supervision. This arbitrary regulation was the source of frustration for some teaching-focused academics.

In both of the above examples disciplinary knowledge is absorbed into the teaching-focused community, via participation in disciplinary research and research supervision. The outcome of this is that teaching-focused academics expand their disciplinary expertise by taking part in research activities.

Asymmetry of brokerage activities

Participants in the study describe a range of brokering activities, formal and informal, both offering disciplinary and pedagogic expertise. However, there is asymmetry in the outcomes for individuals as they pursue brokerage activities, discussed in the following sections.

Both teaching-focused and research-focused academics engage in collaborative activities, where they bring their expertise to the table, resulting in curriculum design with strong pedagogic underpinnings and up-to-date disciplinary knowledge. However, there is no evidence from this study to suggest that research-focused academics seek pedagogic collaborators to contribute their pedagogic knowledge into disciplinary research projects.

For teaching-focused academics, brokerage activities result in the accumulation of new pedagogic and new disciplinary knowledge— they contribute pedagogic expertise, for example working in teams on programme redesign, and keep their disciplinary knowledge up to date when taking part in research projects and research student supervision. For research-focused academics, however, the brokerage activities are more restricted – while they contribute disciplinary expertise, they do not absorb new pedagogic knowledge to any extent. Their interest in upskilling in pedagogic expertise is limited, and they view pedagogic expertise as within the remit of teaching-focused academics, rather than something that they themselves should be pursuing.

Both research- and teaching-focused academics remarked on the pressures of time and its impact on brokerage activities. For teaching-focused academics, time was a pressure which prevented them from taking advantage of opportunities to engage in disciplinary research, such as updating their research techniques or joining a research group in their disciplinary area. Research-focused academics reported time as being a factor in their reluctance to engage with pedagogy, despite some of them expressing an interest in it.

However, while there is a penalty if a teaching-focused academic is not up to date with disciplinary knowledge, the same does not apply to a research-focused academic whose pedagogic knowledge is not in development. For a teaching-focused academic to be able to teach at senior undergraduate and postgraduate levels it is essential that they are well-versed in disciplinary knowledge. For a research-focused academic, there is not the same urgency to have up-to-date pedagogic knowledge, if their teaching responsibility is to lecture and set exam questions.

Role of the Head of Department

The role of the Head of Department was identified as being vital to setting culture within the department, agreeing with the work of Roxå & Mårtensson (2011, p.26). Within this study, there were three distinct examples of how the Head of Department had shaped departmental culture, examined in more detail below. I have used the term “Head of Department” to signify a person in a position of authority who is *de facto* in charge of a group of academics within an organisational unit (as do Roxå & Mårtensson). Head of Department may not be the title of the person in charge; however, their influence remains the same; they are the leader of a defined group of academics. This is not to say that other stakeholders do not collaborate with one another. However, as in Roxå & Mårtensson’s (2011, p.26) work, participants identified the Head of Department leadership figure as being vital in supporting them in their roles. I look in further detail at three institutions, and how the Head of Department shapes departmental culture.

The Visionary

The first example of the role of the Head of Department is that of the Visionary. In this institution, the Head of Department acts as described by Roxå & Mårtensson (2011) and Cooperrider (1986). The Visionary creates the common story for the academics within the department, and is also responsible for leading the department out of a historically bad situation. Staff identify the Head of Department as being supportive and understanding of their roles. Teaching-focused academics also identify that although the Head of Department is not a teaching-focused academic themselves, they are sympathetic to, and understand the role, giving teaching-focused academics confidence. This Head of Department demonstrates a strong vision and direction for the department, and is clear in determining roles and responsibilities for their staff. In this department, academic staff, both research-focused and teaching-focused know what their roles are, are given positions of responsibility and respect one another for the contribution that they make. The Visionary concentrates on their staff, respecting them both as people and as academics, allowing them autonomy in what they do. In return, their staff respects the Visionary, and trust their decision making, both in terms of teaching and research. Teaching-focused academics are encouraged to develop their expertise in SoTL and

pedagogic research. Although the Visionary may not be actively engaged in SoTL themselves, they understand its value.

There are limits to the power of a Visionary as Head of Department. While they are able to give their staff trust and freedom within the confines of the department, they are unable to exert that power in the wider sense. This becomes apparent when there is a clash of institutional policy and departmental priorities. The example specific to this case is the implementation of institutional policy which prevents teaching-focused academics from being first supervisor on a research student project. This policy has caused frustration within the teaching-focused community, as some staff feel that their expertise is being called into question, and their previous track records of supervision are being dismissed. Another example of the limits of the Visionary is in dealing with promotion policy which favours research-focused academics over teaching-focused academics, in particular where there are promotion criteria which are unachievable and which impact on teaching-focused academics.

The Facilitator/Supervisor

The Facilitator as Head of Department is similar to that of the Visionary. This leader looks after their teaching-focused and research-focused academic staff within the department, and there is a culture of mutual trust and autonomy, with academics given positions of authority within the department. However, there is one distinguishing characteristic that the Facilitator/supervisor demonstrates in addition to the Visionary. The Facilitator/supervisor is more strategic in their leadership, making sure that their academic staff are participating in activities which will earn them reward and recognition. This means that there is a more strategic approach to SoTL as pedagogic research, and Teaching-focused staff are encouraged to make their work public. In addition, research-focused staff are encouraged to contribute to pedagogic research by taking a reflective approach to their teaching, in addition to their disciplinary research activities. The Facilitator, therefore, encourages a departmental culture where all academics are engaged with SoTL at some level.

The Manager

The third example of a Head of Department role is that of the Manager. In contrast to the Visionary and the Facilitator/supervisor, the Manager is concerned with policy, league tables and metrics. This Head of Department sees academic staff as a means to improving league table scores; therefore any reduction in position is seen as a deficit in the staff. There is a lack of leadership within the department, resulting in unclear staff roles. Staff are not acknowledged for the job they are doing, but are criticised for what they don't do. This leads to a state of frustration, as staff become demoralised. While there is an institutional requirement for engagement with SoTL, there is little support to

carry it out. Disciplinary research is clearly valued over teaching; however research staff are also viewed through a lens of deficit if they are not perceived to be bringing in enough research money, or publishing enough high impact research papers to satisfy the requirements of REF. While the Manager may be seen to be adhering to institutional goals and enacting institutional policy, there is a concern over a lack of autonomy for, and trust in academic staff. Staff report that they feel that although they may be listened to, their opinions are given lip service. One of the examples concerning a department with this type of leadership was in giving teaching-focused academics the opportunity to return to research teams and engage with disciplinary research. This suggestion was made by the Head of Department and aligns with the kind of brokerage activity that this study seeks to discover. However, when staff tried to take advantage of this opportunity they were told that there was no support for them to do so, and no time allowance in their workload model, despite the fact that it would have been developmentally advantageous for them to take part.

While these three examples are not exhaustive, they represent leadership models operating within university departments throughout the UK. It should be noted that attention to staff and trust-building is a productive model, and has the potential to result in higher metrics and league table scores, as academic staff develop evidence-based approaches to teaching and learning, and reinvigorate their disciplinary expertise. It is paradoxical that the Manager seeks improvement in metrics, but does not encourage the development of academic staff to achieve improvements through evidence-based approaches.

Conclusions

Wenger's work on Communities of Practice (1998) predicts the potential for brokerage activities between individuals in different communities. Brokerage does not just mean the contribution of one's own community repertoire, but also the ability to absorb the other community's expertise. This study into brokerage between teaching- and research-focused academics in UK Life Sciences university departments has shone a light on a variety of activities which academics engage in to keep their knowledge and expertise up to date. While formal and informal opportunities have been identified, those of most interest are the informal opportunities which individual academics seek out and broker for themselves, not the least of which is that they are categorised as informal despite being the core business of the departments. There are several conclusions that can be drawn from the findings of the study, with respects to brokerage. There are formal opportunities which are offered at departmental or institutional level, such as seminars and continuing professional development (CPD) courses. These brokerage activities contribute knowledge from the respective communities but they do not guarantee that the other community absorbs the knowledge. More authentic brokerage opportunities occur in informal situations, for example when an individual academic joins a research group, or supervises a research student. Opportunities for absorbing expertise from the other community are more likely to be seized by teaching-focused academics who understand that they need both pedagogic and disciplinary knowledge to fulfil their roles. The opportunities are positive for the individuals involved, and impact on the currency of their expertise. However, in identifying brokerage opportunities where learning and absorption of knowledge takes place from the other community, an asymmetry has emerged. Teaching-focused academics are engaged in brokerage activities which both share their pedagogic expertise and improve their disciplinary expertise. These academics have previously identified that both pedagogic and disciplinary expertise is necessary in order to teach effectively in higher education (Gretton & Raine, 2015; Tierney, 2016), so it is unsurprising that they should engage in both sides of brokerage activities. Research-focused academics, however, engage primarily in brokerage activities in which they contribute their disciplinary expertise. They collaborate effectively with teaching-focused academics, but their purpose is not to improve their pedagogic expertise. Their collaboration with teaching-focused colleagues is to take advantage of their expertise, and even those research-focused academics who expressed interest in pedagogy were unlikely to become involved in pedagogic research to any great extent.

Departmental culture emerged as an influence on academics, and central to it is the role of the Head of Department. When departmental culture supports academic staff in their roles, the department flourishes (Cooperrider, 1986; Roxå & Mårtensson, 2011). This is due to the role of the Head of Department, who provides strong leadership, knows the history of the department and has a clear vision of its direction. This may be demonstrated in a variety of ways, but common to the successful approaches is mutual

respect and trust between the members of the department. In contrast, departments where metrics and league tables are given prominence over people become less productive, as staff lose direction and vision. Cooperrider's work (Cooperrider, 1986; Cooperrider & Whitney, 1999; Mohr & Magruder-Watkins, 2002) on Appreciative Inquiry offers a way to restore direction to a department, however this relies on support and leadership from senior management.

Recommendations

This study has revealed the variety of brokerage activities occurring between teaching- and research-focused academics in UK Life Science departments, and the necessity of such arrangements for individuals to keep their knowledge and expertise current. At this level, the recommendation may appear obvious, to allow staff opportunities to pursue brokerage activities. However, the academic role is subject to competing pressures and priorities, and so for some academics, the ability to take advantage of such opportunities is limited. It should, therefore, be a priority of management to seriously examine workloads in order to allow time for brokerage.

A second, more strategic recommendation is to examine departmental culture. The work of both Roxå & Mårtensson (2011) and Cooperrider (1986; Cooperrider & Whitney, 1999) demonstrate the importance of supporting staff, strong leadership, and clear roles and direction. It is worth considering taking the approach of Appreciative Inquiry and implementing it in a department, in order to improve working relationships within a department. However, this approach should be taken with the support of the department and the institution, as difficult decisions may need to be taken in order to improve departmental culture, and to address issues which exist at institutional level.

Further work

There is much which remains unknown in this area. The study has uncovered the potential for brokerage and the importance of departmental culture. However, there is work to be done to improving opportunities for both teaching- and research-focused academics. One area in particular is the reluctance of research-focused academics to fully embrace pedagogy and the Scholarship of Teaching and Learning. This highlights the dominance of disciplinary research within UK Life Science departments, and UK universities in general, in particular the influence of the REF. It also highlights that the Teaching Excellence Framework (TEF) (BIS, 2016) has as yet failed to influence this imbalance, despite the claims and ambitions of Jo Johnson. As such, another area which should be pursued is, in the light of the results of TEF in 2017, how that has shaped the role of the teaching-focused academic, and raised the status of teaching within departments and institutions.

A second area for further study emerged, not from the study itself, but from the recruitment process. I was approached by a number of postdoctoral fellows, and adjuncts on temporary contracts, who wished to be part of the study. Those individuals fell outside the remit of this study. However, conversations with several of them revealed issues facing part-time and temporary teachers, working within higher education, which should be pursued in the future.

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