Undergraduate experiences of the research / teaching nexus across the whole student lifecycle

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There is currently much interest in the interconnections between research and teaching in Higher Education. This relationship is usually termed 'the research/teaching nexus'. However, within this wide body of literature there has been little attempt to explore the emergent experiences of students across the entire length of their degree programme. Drawing on the results of a three-year qualitative study that followed 40 students through their whole student lifecycle, this paper explores how undergraduates in an English university experienced the research/teaching nexus, how those experiences developed over time, and how these changes can be variously enabled or constrained. Situating the findings in the context of the 'post-truth' society and the uncertainty of employment futures, the paper highlights how the nexus can also often serve to exclude students as much as it includes.

Keywords: research / teaching nexus, higher education learning and teaching, academic transitions, widening participation

Introduction

'Research-led' teaching is increasingly being used by higher education institutions as a means to promote degrees to undergraduates, respond to the various demands of 'employability', and to help to justify the rising costs associated with higher education level study (Brew and Mantai 2017; Elken and Wollscheid 2016). However, in the context of a 'post truth' society where denialism, populism and an increasing distrust in experts find confident voice on digital platforms and elsewhere, how contemporary students are responding to the ever-increasing emphasis on research within degree programmes remains a key point of issue.

Detailing the results of a longitudinal study, this paper draws on a corpus of 118 semi-structured interviews to examine how the research/teaching nexus (RTN) is

experienced by undergraduates. This includes the phases of development that can occur as they move through their programme, and, some of the constraints that can curtail engagement with research within the context of a degree programme. To be clear, we are interested in examining how 'research' is received and understood within the context of taught undergraduate programmes. That is to say that this paper examines how the RTN is experienced by students, how those experiences develop over time, and how these changes can be variously constrained and/or enabled. In doing so, the paper makes a direct contribution to the literature by considering how research - as a multi-dimensional affective practice that is actively experienced by students in the context of learning and teaching - can have inclusive and exclusive properties.

The research/teaching nexus

The long-standing international debate concerning the relationship between research and teaching is termed the research/teaching nexus (Tight 2016; Hattie and Marsh 2002; Jenkins and Zetter 2003; Robertson 2007). This discussion has variously explored: the association between research outputs of staff and teaching evaluations; the student experience of the nexus; and the differences between institutional types and disciplines.

In the first instance, there has been much focus on the association between research outputs of staff and teaching evaluation, with weak positive, or no relations commonly reported (The Boyer Commission 1998; Hattie and Marsh 1996, 2002). Collectively, these studies highlight that any rhetoric that suggests a strong link between research and teaching is not substantiated by the evidence base - with Hattie and Marsh

concluding that 'the common belief that research and teaching are inextricably entwined is an enduring myth' (1996, 529).

However, whilst direct correlations between output and evaluation are problematic, Coate et al (2001, 172) have also convincingly argued that research and teaching can exist in a nuanced range of relationships. These relations are variously 'shaped by the value-orientations of academic staff and the management of available resources'. To this end, configurations of research and teaching can be seen as integrated, positive, independent or negative - with Trowler and Wareham (2007) further pointing to the importance of contextualising the RTN within wider institutional and policy structures, and the relative agency this affords to professionals.

The second focus of the research interest has variously explored the perspective of student understanding and experience (Brew and Mantai, 2017; Robertson, 2007; Buckley 2011; Jenkins 2004). This debate has sought to examine the differences that exist both within and between institutional types and disciplines (Healey 2005). Jenkins (2004), for example, notes how early assessment of the debate on the RTN lacked the critical appreciation of the student voice. This means that the contingent *experience* of the relationship has been underestimated. Using cross-sectional accounts based on interview data - first with undergraduates, and then with postgraduates – he highlights how more positive outcomes can be gained from being taught by staff who are researchers (Jenkins et al. 1998; Jenkins 2004; Lindsay et al. 2002).

However, such positive findings do appear dependent upon the credible and competent nature of teaching linked to staff research, coupled with the lecturer's perceived enthusiasm towards motivating students. Positive outcomes associated with the RTN cannot be assumed. Firstly, there is evidence that research can be seen to reduce the availability of staff and shift their focus away from teaching and more

meaningful contact with students. Secondly, the emphasis on the research side of the relationship can result in students becoming recipients of research, not stakeholders (Jenkins et al. 1998; Lindsay et al. 2002).

Elsewhere, Trowler and Wareham (2007, 4-5) similarly suggest that more attention needs to be paid towards the dysfunctions of the potential relations that exist between research and teaching. They list several problems:

- Learning too slow to cover curriculum;

- Transmission of essential knowledge poorly effected;

- Patchy coverage of curriculum;

- Low-quality research with poor ethical control;

- Substantive disciplinary research becomes side-lined;

- The needs and priorities of employers and others take precedence in the academy;

- Research prioritised over teaching, leaving non-researchers among the staff as well as students feeling abandoned;

- Teachers spend most of their time and energy on research to the exclusion of students;

- Teaching assistants employed to replace teachers engaged on research resulting in student exposure to lower levels of expertise;

- Students effectively unpaid research assistants;

- Students feeling abandoned.

From the view of the individual student, diversity in the distribution of the advantages and disadvantages of the RTN is likely to arise for a number of reasons. This includes: the extent to which the university identifies as research-intensive or teaching-focused institution (Hattie and Marsh 1996, 2002; Jenkins 2004; Healey 2005); the 'disciplinary knowledge structures' that influence both the conduct and practice of research (Robertson 2007); the year and level of study (Lindsay et al. 2002; Spronken-Smith et al. 2014); and, whether research in the curricula is atomistic or integrated (Brew and Mantai 2017). To this end - and especially in the context of the USA - researchers have variously explored the availability and distribution of high-impact practices of research, and whether they are integrated and available to all, or provided as extracurricular activities to a select few (John and Creighton 2011; Kilgo et al. 2015; Linn et al. 2011).

Building on some of this complexity, both Turner et al (2008) and Spronken-Smith et al (2014) have used large-scale surveys to further explore the RTN within larger samples. These accounts have sought to explore students' awareness, experience and perceptions of staff involvement in research. They report higher levels of awareness of staff research amongst higher year students as well as amongst those in research-intensive institutions. The positive aspects of staff involvement in research revolved around a number of features. These included: the students' understanding of, and enthusiasm towards, the topic; the development of research skills; and, perceptions of the practical application of knowledge. On the other hand, negative influences relate to the lack of interest in: teaching and the facilitation of learning; academic support; poor delivery; and, perceived relevance of the material (see also Jenkins et al. 1998).

These studies have also highlighted that there were different dimensions of research experience. Students highlighted tacit differences between learning about

others' research, learning to do research, and learning through the research process. Higher year students were more likely to have actively experienced the process of undertaking their own research, and more likely to view the research teaching nexus as positive (Turner et al. 2008; Spronken-Smith et al. 2014). Indeed, Healey (2005) has also highlighted the distinction between content and process with the RTN, whereas Levy and Petrulis (2012) also distinguish between the exploration of existing knowledge and the production of original research.

There are, however, two continuing problems with the collective body of literature on the RTN. In the first instance, the vast majority of research draws on cross-sectional analysis, and/or the collection of data from subsequent cohorts of students once their degree has ended (Lindsay et al. 2002). In this respect, both John and Creighton (2011), and Spronken-Smith et al (2014, 368) recommend longitudinal research designs to address this concern: 'an alternative and potentially richer approach would be to track students as they moved through their degrees'. Following the same group of students identifies the changes in their understanding and experiences of 'research' over the course of their undergraduate studies, and emphasises the dynamic nature of the whole student lifecycle rather than isolated parts of it.

Furthermore - and as highlighted by Trowler and Wareham, (2007) - much of the evidence base has largely assumed that the nexus is internally constituted within a particular Higher Education Institution, the ethos of a department or school, and in the working practice of particular members of staff. That is to say that the nexus is typically insulated from those wider contexts of policy and practice that help to construct the experience of Higher Education more broadly. As evidenced by this special issue, the impact of such macro conditions on micro practices associated with learning and teaching cannot be taken for granted. In this respect, it becomes necessary to explore

how increases in the 'cost-sharing' mechanisms of university funding ([deleted for review]), the continuing emphasis on 'research-led' teaching (Brew and Mantai 2017; Elken and Wollscheid 2016), and the popular and political denigration of expertise in a post-truth society, variously shape student experience of the nexus.

In light of these issues, this paper draws on qualitative data from a wider three-year longitudinal study that followed a broad range of undergraduates within a 'research-intensive learning environment' at an English University (n^1=40, n^2=40, n^3=38). It explores how students make sense of the nexus as they move through their degree programme, the dimensions through which students experience the relationship between research and teaching in a 'Red Brick' University, and how these dynamic experiences are variously constrained and enabled within and beyond the institution.

Research design and methodology

There are an emerging number of longitudinal studies in the Higher Education literature that are beginning to examine how undergraduate students experience 'the whole student lifecycle' (Bathmaker et al. 2016; Purcell et al. 2013; [deleted for review]). These studies typically use mixed methods research strategies to follow the progress of students across the entire course of their degree programme. Using institutional information, as well as more primary forms of data collection, they attempt to chart the dynamic and inter-connected experiences of various aspects of student life to see how they develop over time.

As a part of this trend, this paper draws on qualitative data generated from a wider three-year longitudinal study that sought to follow a group of forty home domiciled undergraduate students as they made their way into, and through an English

Red Brick University (ERBU). Starting in 2013, the broad aims of the study were to gain a better understanding of the experiences of undergraduate students, the second generation entering university under the post-2012 tuition fee regime (for a discussion see [deleted for review]). There are, of course, limitations to single institution case study design (Yin 1994). ERBU is research-intensive in nature, and consists of a student body of predominantly white, middle-class, traditional age students. It remains to be seen whether the results outlined here resonate in other universities, especially in those 'teaching intensive' institutions that have a more diverse student intake. However, whilst we would not expect the results of a single case to be exhaustive, the information rich nature of the case-study approach allows considerable insight into the general experience of the RTN in such institutions. In these terms, it is possible to make moderatum generalisations from such an approach (Williams 2000).

Beyond these issue of design, the forty students who took part in the study were selected using a two-stage sampling to achieve maximum variation at case and unit levels (Patton 2002). In the first instance, this involved choosing two or three departments in each of the five faculties of ERBU, with case selection being based on the relative size of the department (small, medium, large), the ratio of students in receipt of financial support (low, medium, high), and the nature of the qualification (professional, professionally accredited, local). Participants were then selected based on a range of characteristics that included gender, ethnicity and age, and invited to take part in the study. Those who agreed to participate took part in semi-structured interviews on a yearly basis toward the end of semester two[1]. Invited to reflect on their

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[1] Two students declined to be interviewed in the third year.

experiences of student life, the interviews explored a range of issues. This included academic progress, lifestyle, finance, health and wellbeing, and career development.

Facilitated through NVivo, interview data were transcribed and analysed each year using the thematic approach, as outlined by Braun and Clarke (2006). Systematic and flexible in nature, this method of qualitative analysis is responsive to both the emergent issues of the data as well as those identified of interest by the researcher. Analysis consists of six stages: familiarity; coding; theming; reviewing; defining; and representing. During the analysis of the first tranche of data, issues that were broadly associated with 'research' were coded under a single heading. In these terms, 'research' was conceptualised as broadly as possible and grounded in participants' diverse understandings and uses of the term. Building on this initial analysis, subsequent interview tranches pursued student views on what they saw as research and how it related to their experiences of teaching and learning - for which the literature on the RTN provided the theoretical frame necessary to explore *their* conceptualisation of research and its realisation within their degree programme. Given the longitudinal nature of the study, highly personalised questions were tailored to the individual context of the interviewee during the second and third phases of data collection, although discussion was broadly directed the following areas: finding and reading research outputs, hearing personal accounts of research, and experiences of actually doing disciplinary research. These discussions were overlaid with considerations of affect, perceived usefulness, and career goals.

In this respect, the study provides something of a constructivist account of the RTN that is based on the 'everyday realism' of those students who engage and interact with it, and as a part of the wider social contexts that they exist within (Jenkins 2002).

This interpretivist process of thematic analysis produced two interrelated themes that are outlined and discussed below. The project received ethical approval from the host institution and was carried out in accordance with their guidance.

Results

The overarching themes of the findings suggests that the RTN is a dynamic process of development that is actively experienced by students both within *and* beyond their degree programme, and that it is affective in nature. That is to say that the nexus is multidimensional, is not just a technical imposition of a particular pedagogical form, and that students develop feelings and reactions to it. In turn, this means that experiences of research in relation to learning and teaching can be both inclusive and exclusive. To be clear, the undergraduates we interviewed understood the relationship between teaching and research to be very broad in nature *and* these understandings changed over time. From the perspective of those who were experiencing the RTN, research was infused within learning and teaching *and* the general experience being a student. Research, and its relationship with learning and teaching, was not confined to strict definition and was very much elastic in nature. With these considerations in mind, the results are structured to discuss two interrelated themes: the phases of development associated with the RTN and, the constraints on engagement.

Phases of development in the research/teaching nexus

Given the dynamic, active, and affective experiences of the nexus, the process of analysis revealed that there were overarching narratives of development across the

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totality of the interviews. Experiences of the nexus were characterised by three phases of development in a number of key areas. This included: the focus of disciplinary knowledge; their relationship with researchers; their experience of research practice; and, their developing understanding of the nature of independent learning.

These phases of development are best thought of as 'ideal types', whereby 'the synthesis of a great many diffuse, discrete, more or less present, and occasionally absent concrete individual phenomena, [are] arranged... into a unified analytical construct' (Weber 1949, 90). In this respect, the phases were *broadly* congruent with the three levels of study (year one, year two, and year three). However, as we shall explore, given the active and effective nature of experience, there were individual differences and not all students progressed through each phase. In this sense, the phases presented below should not be considered normative *or* necessarily aspirational. The phases of development in the RTN are summarised in Table 1, and discussed in turn below.

[Insert Table 1 here]

In the first phase, research was perceived to be a mediated experience that was done by others and filtered through lecturers and associated practices of learning and teaching. Knowledge of research functioned as a broad indicator of disciplinary understanding which needed to be reproduced and demonstrated alongside the development of basic skills that are associated with independent learning. Together, this enabled students to answer specific questions that they perceived to be, by and large, set for them. Particular experiences of this variant of the nexus were often contrasted - both positively and negatively - with previous learning experiences where knowledge was

usually pre-digested for them. The nexus existed on a continuum of learning experiences within the life course that were not limited to higher education.

In the first instance, knowledge of research was understood to be a broad representation of disciplinary understanding. This allowed them to develop their understanding of the 'basics', as Adam suggested:

> I was interested in sort of some of the theories [of sociology]. It was interesting sort of first year just getting to know the basics, but I have to admit someone who has really been influential in my interest has been [name of lecturer], really influential in sort of getting me, [they] really got me interested in Marxism, Weber and Durkheim, those sort of classical social theorists. (Adam, First year)

Within these broad introductions to disciplinary understanding, direct experience of research was mediated through engagement with lecturers and their associated learning and teaching practices. In this respect, producing the disciplinary knowledge associated with research was something that was done by others, as highlighted by Taylor:

> Yes, one of our Lecturers does [talk] a lot [about their research]. He'll say, 'Oh, I'm working on this at the moment.' But usually they don't really mention it. I think probably because it's too detailed for what you need to know but they'll introduce themselves and say what they do. (Taylor, First interview)

The first phase of development was also characterised by a process of familiarisation with the fundamental techniques necessary for disciplinary research practice, whether it be 'in the lab', or developing practical experience of analysing data:

I'm really enjoying the course and even the statistics stuff, I'm not finding it too bad. They've done it well, they walk you through it. (...) And they've done some, interesting stuff where the lecturers have just talked about their interests so that's been nice. Like, they're obviously really enthusiastic so it's quite, you know, educational. (Olivia, First interview)

Engagement with research practice was perceived to be highly structured, with students seeing themselves as being very purposefully guided through key aspects of the research process. The development of basic skills also extended to the modes of communication that are associated with research. This included discovering research, as well as writing about it and referencing it - all of which was carried out amongst a backdrop of independent learning that was designed to answer specific and pre-determined questions. However, this is not to suggest that their development was comprehensively laid out for them. Sadie, for example, reflected on how she sometimes struggled to adjust to the expectations made of her with respect to academic writing, especially referencing:

And then in the sort of comments box I had three lines worth of incorrect referencing and that sort of thing. I really wish we had sessions on how to reference, because they've just sort of been like okay you have to reference all your coursework properly, you have to do all the citations correctly – go – not sort of like step by step how to do it, which is quite frustrating because it is like the more you do of it the more you're expected to get it right. So it will be more helpful to have like actual advice on how to do it rather than just being left to our own devices. (Sadie, First interview)

During this initial phase of development, experiences of research within the context of the degree programme - and the requirements of independent learning more generally - were again actively positioned within a wider educational life course. Khaled, for example, compared the experience of learning and teaching at college and university:

> [At college] you'd get to know the teachers very well… you understand their teaching styles, you understand what they want, you understand their expectations… if you had any questions you could just, sort of just, put up your hand and ask, it was very sort of laid back, relaxed… [At university], it's completely different. (...) the lecturer just stands at the front and lectures and everyone has to take notes as fast as they can... It was just a completely different experience. (Khaled, First interview)

Lectures, and the more primary forms of research content they contained, were tacitly associated with more distant modes of teaching delivery. Emilia similarly highlighted how the nature of the knowledge and the skills she was developing were different from her previous qualifications. However, she also detailed how her own developing experiences of research – in both content and process – facilitated greater understanding of the subjects she was interested in.

> Basically, with A-Levels you know exactly what you have to know for what exam, and you know the style of questions that are going to come out, and you know what words to write for each question in order to get the marks. So you basically learn like that. Whereas at uni they say we'll learn about the liver, go and read about the liver and then we'll ask about the liver. So you sort of don't really know what you have to learn and in what depth. But in a way it's good because you're actually

understanding it more, instead of just learning it parrot fashion…. (Emilia, First interview)

The second phase of the nexus was characterised by an emergent perception of research ownership that was associated with, and enabled by, the personalisation of learning. In this context, the RTN became a vehicle through which students could begin to develop their own interests and needs. Whilst these decisions were still facilitated through the various structures of their curriculum, students began to recognise the disciplinary choices they could make with respect to the research they engaged with as a part of their programme. These selections were variously connected to topics of research, particular members of staff who did research, and a greater familiarity with the various styles and forms of information and communication that were associated with research. In turn, this enabled them to reflect on their experience of both research and learning in a more critically-informed manner. In her first year, Ade described the process of choosing between two subjects, and how she needed to seek detailed advice to help guide her decisions about what she would research.

I read so many things! I had two options for my assignment and I read so many things on one particular illness and I read something else on the other. I became confused so I just said and now I don't even know where to start. [I met one of my tutors] and I was so happy. He said which of them do you prefer best and I said I like them two best. But he advised me to just drop one thing out and, you know, use the other. (Ade, First Interview)

In her second year, however, Ade had developed the confidence to make independent decisions about what she would select to research within the modules that she had chosen to take:

The modules, you know, there are so many choices - especially when you are given options to choose which of the questions you want to answer. What I do is I just wade through the unit handbook, see where this topic will be taught then I will hang around, and stop as soon as it is taught; I don't go towards the last unit, to the last topic. I just wait the first five weeks… So I choose my topic, from then I will start doing my research. And it does work for me, it does work for me. (Ade, Second Interview)

By the time of her third year when she was just about to complete her self-selected dissertation project - and like many of the cohort we interviewed - she was increasingly reflexive about how she had developed the ability to critically appreciate information to enable her to make more informed-decisions:

With doing this course I've really opened my eyes to so many things I had no idea about before. It's also given me confidence. There are times things happen in our lives and we just think that's it. With the position I am in now, I can see that there are two sides to a story, two sides to a coin, I am able to differentiate. If I react this way, if I react that way. It's for me to balance the situation that I may find myself. Really, my eyes have been opened to so many understandings, I've seen so many things, things that I've read, things I've been through - I can write an academic book! I swear that it's really made a difference in my life and I think it's a transferable skill. (Ade, Third Interview)

During this phase, the perceived capacity to begin to take ownership over their learning choices – and recognise that they did have choices - was at least in part due to their increased ability to critically navigate university expectations associated with research. Taylor, for example, highlighted how her use of information literacy was transforming how she engaged with research in the context of learning and teaching:

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Also all the additional reading, they give you like five different text-books and papers to read from, so I just, I'm really picky and I only add to my notes where I think it's necessary for a better understanding. So I try and just be… not overdo it. I don't try and spend too much time focusing on one thing because I know that I will run out of time in other areas. (Taylor, Second interview)

This increase in perceived capacity also extended to the skills associated with research practice, which became much more problem-focussed.

And, for an example, there was one lecture they gave them a bag of cement and said, "Find out how much chromium is in it," and then they leave you to and you've got to think of your method. You've got to do the experiments, you've got to collect your data and do [the] calculations and stuff. (Gemma, Second interview)

Of course, the capacity to engage with problem-based research was somewhat directed by the nature of the curriculum. However, for Megan, and others like her, this increasing familiarity with both product and process of research extended to the more personable relationships she was developing with her lecturers. This helped her develop a sense of academic belonging that was associated with the people who produced research:

And it's really so funny because the main piece of work that's been written about what I'm doing is by [name of academic] and [the lecturer] was just going, "Oh, yeah, [name of academic] is really good at this," like they're mates and it's really cool! I had a bit of fan girl moment, "Woohoo, he's like calling her by her first name." Then when I was reading her work and she was quoting him, like, "[name of academic] says this," and it's just really cool! Yeah, big dogs of the [research] world and I'm there! (Megan, Second interview)

The final phase of development saw students internalise research as a practice to become something that they do themselves for their own academic and everyday purposes. That is to say that research became part of their identity. Indeed, working more closely with researchers to produce their own research, students in this phase of development were able to use their knowledge and capacities to generate their own research questions and engage with, and generate, new knowledge. This further enhanced the perception that they had taken ownership of their learning. As Lizzie summarised, she decided to conduct her dissertation project into an area beyond her initial research interest:

> I think it's because now I've learnt a lot about [my initial research interest], and now I'm interested in [other research area]. So now I want to learn a lot about that, and [for the] dissertation you have to write 10,000 words (...). So hopefully I'll learn a lot more about it. (Lizzie, Third interview)

The processes of discovery associated with research capacity provided Lizzie with the platform to narrow her choice of topic towards her own generative interests. Mary similarly described how her engagement with researchers in the context of learning and teaching had changed across her university programme:

> If [academics are] teaching in third year, they're teaching a topic that is less general than… PS101, which is just a basic overview of psychology. [But] you get to third year [and] you've taken one huge area of psychology and gone into a domain of that professor's area of research. They know more about it, they have more passion about it. They teach it better because it's something they're really interested in and I think basically in that sense you get to know them a bit more

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because you get to see like their particular area of interest and what they can do and what they know. (Mary, Third interview)

This increase in familiarity with researchers and their professional interests enabled Mary to fully engage with the demands of her course, and the increasing focus of research. However, some decisions concerning both the focus of disciplinary knowledge and their relationships with researchers were more instrumental. Lucy, for example, highlighted how she used her prior experiences to make judicious choices about who, and what, she chose to discover:

Some [tutors] are a bit harsher than others…[S]ome, I think, like to fail people, so you kind of have to pick and choose which tutor you think is going to be the best for you to do [the practical with], because one tutor will just fail you for a silly thing that isn't important. (Lucy, Third interview)

For some, this instrumentality carried through to the choices they made with respect to disciplinary content. Mo, for instance, made decisions about what he would focus on based on his previous performance, and the fact that he saw his final year as an opportunity to move beyond the more descriptive constraints of his second year experiences. His third year became a more engaging exploration of what he saw as his specialism, based on previous performance:

I just basically looked up my grades from last year and I thought well I do the best in [area of science]. So I'm going to go for the [area of science] and it's the one that I had the least amount of kind of [other area of science] to a degree. (...) I know I sound really mixed, but it just doesn't irritate me like the second year did, where it was just writing down information. (Mo, Third interview)

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At the very height of this development was an ability to meaningfully connect their experience of the nexus to their perception of their future self. Dylan, for example, saw how his degree experience, and his experience of research in the context of learning and teaching, could be made to connect to his career goals of becoming an engineer:

> [Talking about an industry visit] You cannot comprehend the magnitude of it. But then when you're up close it's different and it's,... I loved it 'cause it was pretty much everything we've done in 1st and 2nd year there. You can actually see in front of you, just it's there rather than (...) only having the paper view. You have a real materialistic view of it; I loved it. (Dylan, Third interview)

Constraints on engagement

However, as suggested above, not all students progressed through each phase to connect learning and teaching, research, and employment futures. As an experience that was both active and affective in nature, the nexus could variously constrain as much as it enabled. These constraints were broadly concerned with diminishing interest in the nature of research; the lack of sufficient scaffolding around experiences of research and teaching; the perceived distance between students and researchers; and, the wider context of participation in higher education.

In the first instance, some people simply did not find the practice of research interesting. Sara, for example, engaged positively with the process of carrying out a research project, but recognised that the reality of what that involved held little long-term attraction.

> I actually did a research project [..] and, yes, I enjoyed it but I wouldn't pursue a
> PhD in that area but I enjoyed the research and like being independent […] It
> taught me I don't want to work in that area… Every day it would be the same
> thing. I don't know if I have the stamina to just keep doing the same thing but
> changing little things every day. I didn't find it rewarding. (Sara, Third interview)

This diminishing interest can apply to substantive topics for research, as well as the process of carrying it out. Rachel, for example, highlighted how the day-to-day specialities of research failed to resonate with her own interests – in this case, those associated with practice of archaeology.

> I hate the British Museum with a passion, I find it the most boring place on the
> planet, I just don't like history about objects. I think this is why I don't like the
> Anglo-Saxons 'cause it's so based on archeologic research. And so 'cause my
> Lecturer was getting so excited, he was, "There's a belt buckle, this belt buckle has
> been found" and he got so excited and I was just, "That's really cute, I'm really
> happy for you, but it's a belt buckle. Can we put this down to size?" I just know
> I'm just not really interested in some dice that someone threw, that doesn't mean
> anything to me. (Rachel, Third interview)

Perhaps the main constraint on engagement was the perception of distance that students experienced between themselves and researchers.

> I feel like the reason why we're a Red Brick is because that support is not there.
> We are old fashioned - and I think old fashioned is 'research'. As in your lecturer is
> a researcher doing the top end of the [research area] or whatever, and that is great
> and everything, but it doesn't help me. (Natasha, Third interview)

This constraint was particularly likely where there were repeated experiences of distance between the perceived goals of both staff and students. Natasha's overall assessment of 'Red Bricks', for instance, was based on a related set of experiences that occurred throughout the programme. In her second year, she suggested:

Well I tried [to ask for support] in first semester [of first year] when I got my non-assessed back and the person I saw my work with, [they] went, "Don't worry, you won't get this in the final". It was, "Don't worry, you'll improve, it's fine, as long as you do another reading." I thought okay then. And it didn't improve, it got worse. And I just thought if that's the help that I'm going to get I'd rather get help from my peers, which is a lot better. (Natasha, Second year)

Students were also more likely to question the nature of research in respect to their degree programme if it was seen to lack the sufficient scaffolding to enable them to make sense of what was being asked in both substance and practice.

The worst module - it was just so bad - is about [module topic], which I'm actually really into. But it just put me off because the lecturer (…) wouldn't set a reading list. He would just be like, "These are the questions, go and do research," which in theory is a good idea but it's like, "Where do I start?" We don't know what books are good, how to find any articles for it. I don't know, I just didn't think it was a very good way of doing it. (Megan, Second year)

Others also positioned this lack of close contact, and their experiences of independent learning that they associated with research, within the wider context of tuition fee rises associated costs:

[S]ome more hours would be quite nice just to be able to feel like I was doing a bit more and having a bit more involvement from the [academic staff]. At the end of the day, with all these tuition fees I'm paying for this, at the moment it doesn't feel like I'm getting my money's worth in terms of my teaching, the response from my teachers, feedback in general. (...) It sort of feels like I'm paying £9,000 to teach myself a degree, which is really, really frustrating actually. (Sadie, First year)

They want us to work on our own… but then we're still students and we're still paying them £9,000 a year and it's like, what are we paying for? 'We're going to the library ourselves, we get, like, six hours of lectures a week where you tell us to go and read certain books.' You know, it just it seems... I don't know. I understand what they want us to do but they don't give us a whole lot. (Amy, Third interview)

Elsewhere, over the course of their degree many of those students from poorer backgrounds who were in receipt of substantial financial support also recognised their difference from the general cohort of students. The wider context of their participation in higher education meant they felt that they had to work harder to experience the benefits of the nexus.

I mean [fellow students] had resources and they went to pretty good schools, and, I mean, their accents sound like they can just talk quite well without even actually just thinking about it. (...) I have to try a bit harder and I, kind of, got annoyed. Do you know what I mean? (...) It's so weird, like, even my accent's become more southern. (Khaled, Third interview)

In this respect, inequalities associated with entry to HE were also realised in the requirements of the research they needed to engage with as part of their degree. Just like other aspects of their degree experience, the RTN did not exist in isolation from their social and economic background ([deleted for review]).

Discussion

The terms 'research-led' 'research-intensive', 'research-oriented', and 'research-based' are now ubiquitous within the landscapes of Higher Education Institutions (Griffiths 2004). Research – and its integration with learning and teaching in the form of the RTN – is now seen as a crucial marketing and recruitment tool in order to increase prestige, 'brand power' and resource accumulation (Marginson 2013, 358). This paper underlines the need to a) problematise the normative presentation of research in terms of its relationship with learning and teaching and, b) to understand how students actually experience 'research' within the context of their programme *over time*.

In these respects, the literature on the RTN often tacitly assumes that it exists, in one way or another, as a relatively fixed form of pedagogical practice (Tight 2016). To take the simplest example, we might assume that it can be measured in the relationship between student evaluations and research output (The Boyer Commission 1998; Hattie and Marsh 1996, 2002). This gives the appearance that the nexus is, for want of a better expression, something of a 'social fact'. However, the findings presented here resonates with others arguing that the nexus can exist multiple different forms (Coate et al. 2001; Trowler and Wareham 2007; Jenkins 2004). Indeed, the students in this study characterised the nexus as multidimensional. It was dynamic in nature, actively experienced, and affective in reaction. That is to say that how students conceived and experienced the nexus changed over time. It was contingent on, and understood in respect to, other aspects of their lives, and, they had meaningful reactions to it that were both positive and negative.

In detailing these findings the paper makes two important contributions to the literature on how students experience the RTN (Healey 2005; Robertson 2007; Buckley

2011; Jenkins et al. 1998; Lindsay et al. 2002). Firstly, it demonstrates the utility of taking a lifecycle approach in exploring the dynamic nature of pedagogical experience (John and Creighton 2011; Spronken-Smith et al. 2014; Kilgo et al. 2015). Longitudinal designs are able to reveal some of the diverse complexities of experience over time, and highlight how pedagogical developments take place across the course of a whole degree programme. Secondly, the findings show how the nexus has both inclusive and exclusive properties that are experienced in accordance to the wider contexts within which students are situated. That is to say that understandings and experiences of the RTN are not necessarily a direct product of pedagogical practice or curriculum design. Instead, they are contingent upon the developing individual interests and experiences of students, emergent career goals, and the wider contexts of higher education policy and practice within which participation in learning and teaching takes place (Trowler and Wareham 2007; [deleted for review]; Brew and Mantai 2017; Elken and Wollscheid 2016).

These experiences also take place within the context of the past and the future and are not insulated by institution or time. Indeed, whilst the findings of this paper concentrate on how the nexus is actively experienced by students throughout 'the whole student lifecycle', understandings of the nexus are also likely to develop after graduation. This is particularly likely to be the case with students undertaking postgraduate Masters programmes, taught or research, or indeed doctoral studies.

The abilities, capacities and identities, associated with the RTN that are detailed within this paper are also not limited to academia. In a world littered with 'fake news', partiality, 'spin', and an apparent failure to see the bigger picture (Christie et al. 2016, 484), the requirement for information literacy, independent learning, critical appreciation, and - in one way or another – the broad ability to do 'research', are all

crucial in being able to navigate everyday networks of knowledge that continue to be made available through digital technologies.

Moreover, on top of an increasingly competitive global graduate labour market, the rise of artificial intelligence and automation are also generally expected to have a profound impact on the future of labour markets (Brown 2013; [deleted for review]). However, there is also evidence to suggest that graduates might not always be well positioned to respond to these emerging demands. For example, Arum and Roksa (2010) have demonstrated that as many as a third of college students in the US did not demonstrate a significant improvement in skills-based competencies such as critical thinking, analytical reasoning, and written communication. Not only have these capacities been highlighted as important in future employment, they are also those that resonate most strongly with the third phase of the model of the RTN detailed here. Given these concerns *and* benefits, Aoun (2017, 21-22; emphasis added) has called for a 'robot-proof' higher education, suggesting that HEIs are 'ideally positioned to transfer the creative tenets of their research mission with their educational one, using them to *help students develop the mental capacity to create new knowledge*'. He goes on to argue for a new learning model of higher education that variously encompasses critical thinking, systems thinking, entrepreneurship and cultural agility. Whilst the findings in this paper would tend to support the idea that developing experiences of the RTN could be useful in helping to achieve these aims, they also highlight that the nexus can exclude as much as it includes, and that any benefits cannot be taken for granted. This is why it is important for higher education institutions to engage meaningfully with the *experience* of the RTN, not as merely as a cynical vehicle to justify academic research in face of the rising costs of higher education level study.

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Table

Table 1. Phases of development in the research/teaching nexus

	Phase one	**Phase two**	**Phase three**
Focus of disciplinary knowledge	Broad	Selecting	Narrow
Relationship with researchers	Distant	Personable	Close
Experience of research practise	Guided	Problem-based	Generative
Nature of independent learning	Answering	Critical	Discovering