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## Putting research first? Perspectives from academics and students on first-year undergraduates learning research

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### Abstract

*Exploring the place and potential of 'research' in undergraduate degrees has stimulated higher-educational debate for decades, strongly influencing policies, practices and structures. This article's consideration of some problems associated with teaching and learning about research during the first year of undergraduate degrees, helps throw that debate into a sharper light. Should first-year undergraduates be asked to learn from their own or others' research, and what difficulties might they experience? What relevant previous learning about research, or lack of it, might they bring with them into their degree? Working with empirical data from across one English university, and literature from universities across the world, these questions are discussed by exploring first-year undergraduate teaching and learning, through the lenses of critical inquiry and constructivist grounded theory.*

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## Introduction

Universities everywhere face a familiar and challenging question: How, during the practices of teaching and learning, might research and education best be linked for undergraduates?

Recent literature reviews sketch various weaknesses in research investigating that field. Terms like 'research' and 'teaching' lack "unambiguous definitions" (Elken & Wollscheid, 2016, p.3). Studies sometimes underplay barriers or difficulties in linking undergraduate education and research (Malcolm, 2014; Tight, 2016). Historically, despite multiple attempts to prove beneficial relationships between individual academics' research and their teaching "a solid research framework seems to be missing" (Verburgh, Elen, & Lindblom-ylänne 2007, p.461).

Recognising such complexities, a recent survey across 23 Western European universities argued that evaluative characteristics of research-based higher education are "best conveyed through qualitative case studies" (Fung, Besters-Dilger & van der Vaart, 2017, p.4). After reviewing the vast international research literature around research-teaching links, Tight (2016) called for teachers' and students' "practices and relationships at the micro-level ... to be better understood" (p.13). Responding to that advice this article constructs one such fine-grained, qualitative account. It investigates across a post-1992 English university of 25,000 students, key difficulties academics report first-year undergraduates' experiencing, when learning through or about research. Via close analysis of a small illustrative sample, it then explores previous research-related learning that some students perceive they bring into university.

## Literature and Context

Clear benefits from undergraduates learning about and through research are acknowledged in recent stringent, structured literature

reviews (Elken & Wollscheid, 2016; Malcolm, 2014; Tight, 2016). Such benefits are also convincingly evoked in numerous case study reports (e.g. Carnell & Fung, 2017; Tong, Standen & Sotiriou, 2018). But what does 'research' mean? Within this article research is defined as "systematic inquiry made public" (Stenhouse 1978, p.1). Typically and in practice, such inquiry is then variously interpreted by universities' multiple disciplines; and (ideally) progressively learned by students by working through different dimensions (Healey & Jenkins, 2009).

Whatever precise definitions individual academics or disciplines adopt, first-year undergraduates at the writer's university *expect* to learn about research. Responding against a five-point Likert scale a few weeks into their degree, 85 of 91 first-year undergraduate participants during an October 2018 survey thought it 'very' (49%) or 'extremely important' (44%) to 'learn about a wide range of research skills at university'. Forty-five percent were studying for an arts, humanities or education degree; 55% were following one of two science programs. Similarly during a year-long, constructivist research study involving 29 first-year humanities and social science undergraduates at an English university, Levy and Petrulis (2012) reported that they all "readily identified engagement in research as part of the first-year experience ... a central and defining characteristic of university learning as compared with secondary level" (pp.90-91). Most were "positive about inquiry and research" (p.96); and all had left school, sixth-form or further education college in the past year (the main institutions educating pre-university UK students).

If first-year undergraduates expect to learn about and through research, what helps or hinders their success? In Levy and Petrulis above students "strongly emphasised" needing plenty of guidance and formative feedback (2012, p.96). Spronken-Smith, Walker, Batchelor, O'Steen, and Angelo (2011)

examined enablers and constraints influencing inquiry-based learning across ten New Zealand higher education programs. Four cases ingrained inquiry throughout the degree, sometimes leaving undergraduates struggling with “new expectations being placed on them to take increased responsibility for their learning” and “developing skills in self-evaluation and self-reflection” (pp.23-24).

In a wider international exploration of academics’ perceptions of the necessary skills for, and hindrances to, early-undergraduate research learning in geography (Walkington et al., 2011) similar barriers persisted and others appeared. They included large classes, students’ lack of confidence, passivity and limited research skills (also Guo, Loy & Banow, 2018; Wood, 2010). Recent literature examining first-year undergraduates’ induction and learning experiences echo such challenges. Australian research cited first-year students facing multiple difficulties, including time-management, workload and others’ expectations (Brooker, Brooker & Lawrence, 2017). More specifically to this discussion, in an Irish study using reflective journals with first-year undergraduates “researching/preparing for assignments” was students’ most frequently-mentioned difficulty (Sheridan & Dunne 2012, p.240; also Maunder, Cunliffe, Galvin, Mjali & Rogers, 2013).

Recent empirical studies of first-year undergraduates entering different English universities, elaborate on students’ potential challenges when learning through ‘research’. Webb and Cotton (2018) drew several conclusions from a careful quantitative study of first-year undergraduates considering “withdrawing”. These confirmed that “independent learning, whilst unrelated to contemplation of withdrawal, poses a challenge to some” (p.846). Interestingly, commencing undergraduates *rarely* experiencing ‘lectures’ and if faced with pedagogies they were not expecting at a university, was one of four key

factors clearly associated with *actual* withdrawal

Anderson, Watson and Southall (2016) evaluated a student-centred teaching and learning approach for first-year business undergraduates, in which outcomes from students’ research were shared across groups. They noted the importance of a supportive environment for undergraduates newly experiencing “the deliberate withdrawal of explicit instruction” (p.983).

In another university, creating such a supportive environment was attempted by introducing a cross-disciplinary, cross-faculty four-week immersive induction module (Turner et al., 2017). Its standardised teaching of academic study skills emerged as particularly problematic. Some more experienced or confident learners felt condescended to, and most students disliked such teaching unless it was discipline-specific. First-year undergraduates’ preference for, and high valuing of discipline-embedded academic literacy support, emerged also from an excellent single-discipline Australian study (Palmer, Levett-Jones & Smith, 2018).

The English study concluded that the early use of open-ended or problem-based learning, which superficially might appear helpful to teach about research, “given the potential vulnerability of first-year students ... should be carefully structured and supported” (Turner et al. 2017, p.818). Interestingly, an Australian case study similarly tracking the sometimes challenging introduction of inquiry-led learning into a media studies program, over five years and iterations, concluded with similar advice (Wood, 2010).

Recent literature seems therefore to counsel drawing a wary line between setting ambitious or idealistic objectives, and deploying cautious, structured approaches to introduce commencing undergraduates to university research. The empirical data below, whilst

elaborating on such challenges identifies a further issue, less visible in the literature. As higher educators are we doing enough with first-year undergraduates to challenge or build upon their existing attitudes towards, and understandings of 'research': as imbibed from culture, family or friends and gained or omitted from previous learning?

## Research approach, data sources and analysis

This study's empirical element used survey, interviews and textual analysis to create and analyse six key data sources. Those processes were framed within a constructivist grounded theory approach: a "method for conceptualising ... actions and processes to reveal their implications" (Charmaz, 2017 p.34). It opened by surveying 114 academics to identify emergent issues. These issues were further explored during interviews with five educators in the survey group, then six who were not. Structured interviews were then conducted with three students studying one module, all of which informed final, close analysis of 11 students' work from the wider group.

As alluded to previously, this study's emphasis upon close analysis of qualitative data stems partly from the catalogued difficulties of satisfactorily, quantitatively investigating 'research-education links', especially given the diverse practices and concepts those generic terms can encompass, their multiple potential inputs and higher educators' sometimes widespread over-optimism about linking them during undergraduate degrees.

Tight's international literature review (2016) instead recommended "further detailed research" into the "messier matters of forging research-teaching links in practice" (p.13). The empirical evidence in this article reflects that focus on practice; and on helping us as higher educators in the crucial process of *Becoming Critical* (Carr & Kemmis, 1986).

Such critical traditions draw also from Dewey's philosophic pragmatism. They position inquiry as potentially worldly and situated: "not looking for *the Truth* but rather *what fits* for the situation" (Stark 2014, p.89). Yet as Charmaz argues, constructivist grounded theory approaches are not just pragmatism. As in this article they foreground "people and their perspectives" (2017, p.38) in real-world, practice-led contexts; and use pragmatist, abductive reasoning to "move back and forth between stories and analysis" (p.41).

To acknowledge the practice and research-based expertise of its participants, open questions were prioritised when collecting the key data sources reported in Table 1. Inductive analyses of practitioners' answers (Preissle, 2008) from each data-collection phase were then used to identify emergent instances, categories and themes (Thornberg & Charmaz 2012; Winston 2012). These in turn influenced and informed, the focus of the next phase. Such methods "begin with the empirical world and build an inductive understanding of it as events unfold and knowledge accrues" (Charmaz 2017, p.35).

Over its fifteen-month course this empirical research therefore took on aspects of an investigative, critical story "derived from evidence and in answer to questions". That phrase refers back to procedural principles for evidence-led educational storytelling, longitudinally developed by the author in different settings (Bage, 1999, pp.86-88). Like all research such a story interprets rather than reproduces reality (Charmaz 2017). Its investigative aspects unfold below, presenting data from the perspectives of key protagonists and partners: academics and first-year undergraduates.

Table 1

**Key data sources**

<b>From academics</b>	<b>Description</b>	<b>ID</b>
1. Academics Survey (March/April 2017)	Survey of 114 often senior and generally experienced academic staff - 51 responses from all ten university Schools: Social Science Schools (18), Science Schools (15), Cross-university roles (15), Humanities School (2), Creative Arts School (1).	AS1-13
2. Experienced educator interviews (January 2018)	Follow-up interviews with survey respondents in five different Schools.	EE1-5
3. Course Leader interviews (March 2018)	Interviews with two course leaders (not surveyed) of a Creative Arts undergraduate degree.	CL1-2
4. Student support team interviews (May 2018).	Interviews with four educators (not surveyed) directly supporting struggling undergraduates in a Social Science School.	SST1-4
<b>From students</b>	<b>Description</b>	<b>ID</b>
5. Student interviews (December 2017)	Structured interviews with three first-years studying photography in a Creative Arts undergraduate degree (3 above)	St 5, 10, 12
6. Students' learning outcomes (November 2017 analysed 2018)	'Think About Your Research Experience': learning outcomes from 11 first-years (half a module group) seven weeks into that degree.	St1-11

## Evidence from academic perspectives

In an exploratory survey answered by 51 academics and in conscious response to criticisms that previous research tended to over-optimism about undergraduates learning through or about research (Malcolm, 2014; Tight, 2016), open-ended questions asked for perceived 'practical barriers' to research-rich undergraduate learning and teaching. A quarter of responses offered detailed examples e.g. "I wonder whether we are starting research learning early enough in our courses" (AS1); or advocating "preparing students during their first semester to appreciate the value that research can bring to all levels of work including their assignments" (AS2). Subsequent data from 11 interviews further explored difficulties when teaching and learning through or about

research. It was inductively analysed in several stages over six months, aided by the challenging critical support of two colleagues. Three inter-related storylines emerged describing barriers or difficulties for some first-year undergraduates; told wherever possible below in practitioners' own words

### *Storyline 1 - students' difficult transitions to independent learning*

Twenty-four pieces of data informed this storyline. Four expressed positivity about students' previous secondary education in schools or colleges. Many more worried that first-year undergraduates were insufficiently prepared by prior experiences, independently to pursue research-rich learning. Too much support could create learners "quite dependent upon their teachers" (EE3), learners used to sometimes being "spoon-fed and constrained"

(EE2). A highly-experienced educator found commencing undergraduates: “Insecure, unself-confident, they don't think they're creative ... unaware of what they can do” (SST4). Some first-year students arrived with “barriers of preparedness e.g. in knowledge base or sophistication of thinking required” (AS5). A “change of culture may be challenging and/or unwelcome” (AS6). Current undergraduates seemed “more comfortable with a passive learning style, where information is imparted and they absorb it, as opposed to them being active in the process of discovering information” (AS7).

Other comments criticised universities own planning for first-year undergraduates, foretelling recommendations made in this article's conclusion: “We do not encourage students enough to engage with research” (AS3). University educators needed to secure a “better understanding of the research skills students already possess” (AS4). Independence needed scaffolding: “Students are hardly in class during the first few weeks. So they are just expected ... to become independent learners almost themselves. We don't support them enough” (EE3).

## *Storyline 2 - cultural inhibitors to confidence*

Such support, it was argued in more than half of twelve further pieces of data, could be especially helpful to individual students without a familial culture of independent, research-rich *academic* learning. Students who were the ‘first in family’ to attend university “haven't necessarily had that support or guidance from somebody who knows about being at university” (SST1). Such students could lack “Parental conversations about university life or experience. A lot of students I speak with their parents can't read or write. Normally their mothers can't read or write” (SST3). Despite “fantastic” previous support in schools or colleges vulnerable students could suffer at university because

having been “dug out of holes in the past ... it is a very big leap at university to go from being dependent to being independent” (EE2). Confidence and skills needed incremental growth and therefore careful, learner-focused, educationally-driven curriculum planning: “We really need to build their self-confidence to engage actively in research and inquiry, that is the biggest challenge for students” (EE3, also CL2). All these observations derived from experienced practitioners, working closely to support many such students.

Others, especially senior managers, highlighted policy-led rather than familial cultural inhibitors. “Fees encourage a less exploratory attitude to being a student” opined an Associate Dean (AS8 - most English undergraduates in 2017-18 incurred annual debts of at least £9,000 for tuition fees). Another Associate Dean criticised:

This market-driven H.E. culture in which students do not see themselves as scholars but customers (‘I haven't paid £9000 to do x, y, z’). It is very hard to get even engaged and committed students to see the value of scholarly activity or curiosity-driven research (AS9).

First-year students perhaps unused to independent academic learning, from familial or social backgrounds where few may have been to university, taking on large loans, clearly may face daunting transitional challenges in learning through or about research; challenges both underpinned and magnified by a final set of inhibitors.

## *Storyline 3 - inhibiting academic attitudes, knowledge or skills*

Eighteen other pieces of data comprise storyline three. Some as above feature educators' perceptions of students' cramped academic attitudes, knowledge or skills e.g. a “general unwillingness to spend time reading anything which does not appear to be directly linked to a

future assignment” (AS2). A cross-university professor reported “student anxiety, not wanting to take risks, not being clear about learning approaches” (AS10). One Associate Dean identified “Increasingly assessment-driven students who fail to perceive the wider benefits of research-rich teaching and learning unless explicitly linked to assessment” (AS11). Another perceived significant “barriers around students having little personal learning confidence” (AS12).

Others focused less on attitudes, more on knowledge or skills. Weaker students have “not learned how to sift material. They have quite a shallow view” (EE1). Universities’ “biggest mistake” was assuming that “students are savvy with information technology but that’s not true in many cases. We constantly make assumptions that [first-year] students will know how to do this, that or the other” (SST3). But first-year students who had “been out of work or education for a while” may lack “quite basic digital information and skills” (SS2). A program leader observed some commencing students with “serious handicaps of not being able to read, to write ... not being encouraged to express ideas” (CL1). This principal lecturer described teaching first-year students with “very limited experience of reading in school, prior to arriving at university” (AS2).

First-year undergraduates often displayed a “mixed picture around information and data literacies” (AS13) having not “previously perhaps read at a very high level”. Yet “they come here in the first year and have to digest and interpret and decipher - that is really hard.” (EE4). Acquiring the nuanced, sophisticated writing skills to explore research was particularly challenging: “hence the need to start from year 1 level 1” (EE4).

## Why that is not the end of the story

Despite observing such wide-ranging barriers and difficulties, the 51 experienced academic practitioners providing data sources 1-2 were

nevertheless overwhelmingly positive about associating undergraduate learning and research. Against a five-point Likert scale 70% ‘strongly agreed’ and 20% ‘agreed’ that ‘undergraduates needed more opportunities to learn about and through research’. They also offered numerous constructive change proposals to advance that aim (Bage, 2018).

Yet student perspectives are also needed. Triangulation of data may uncover “both correspondences and discrepancies of value” (Robson 1993, p.383). This is especially important because ‘transition’ is a deeply problematic concept; often unhelpfully constructed from institutional or taken-for-granted academic perspectives, rather than from students’ lived experiences (Gale & Parker, 2014).

In practice students’ *learning* and educators’ *teaching* are also intertwined, not separate ventures: mutual rather than singular. Both consist of multiple practices which socially and culturally “condition behaviours, enabling and constraining them in particular ways” (Trowler, 2012, p.30). Each person who is teaching and learning, individually but also as part of a group, negotiates with others the activities and tasks that constitute their work: ‘negotiates’ in the senses of both navigation (finding ways) and mediation (working towards shared understandings). The socially constructed, dialogic nature of such educational processes has long been documented across disciplines, settings and age ranges (e.g. Bruner, 1996). In higher education beneficial claims are often made for constructivism: e.g. that negotiated, constructivist educational approaches to undergraduates learning about research result in more inquiring students (Levy & Petrulis, 2012) and/or longer-lasting outcomes (Wells & Edwards, 2013).

Finally, research texts are also constructed. Table 1’s data-sources are not straightforwardly ‘true’: each is a negotiated product, influenced by social and cultural

expectations (Silverman, 2003). To present a critical research story, evidence from experienced academics about challenges to students learning about research, need to be balanced with data from actual first-year undergraduates.

### Evidence from student perspectives

Three students from a 24-strong module group in the School of Creative Arts volunteered to be interviewed (data source 6), as previously had their tutors (data source 3). Eleven fellow-students also consented for outcomes from one learning task to be analysed as data source 5. That task was to offer and write about a photo representing a pre-university experience of research or inquiry. Its purpose, the course leader told students, was preparation before a

first tutorial in which “we will start to think about how you conduct research”.

### ‘Think about your research or inquiry experience’: data source 5

Images and commentaries from eleven consenting participants were therefore scrutinised by the researcher. As with previous data, inductive analysis was used to identify instances, categories and themes (Thornberg & Charmaz, 2012).

All students cited one or more instances of a named person, place, book, text, image or experience. After repeated sifting 42 instances were identified, iteratively categorised into nine types and then were themed under three main headings in Table 2:

**Table 2**

*Instances of 1<sup>st</sup> Year Creative Arts students ‘thinking about their pre-university research or inquiry experience’*

ID	INTERNALLY REFERENCED (Theme 1)			EXTERNALLY REFERENCED (Theme 2)			RESEARCH PROCESSES (Theme 3)			Totals
	Family or Home	Travel	A-level or College	Specific Book	Exhibition or Event	Named Artist	Practice	Criticism	Knowledge Creation	
St1	√	√					√			3
St2				√	√	√			√	4
St3			√	√	√	√		√	√	6
St4			√	√		√		√	√	5
St5	√			√	√				√	4
St6	√	√					√			3
St7	√						√	√		3
St8					√		√	√		3
St9			√			√	√	√		4
St10			√			√	√	√	√	5
St11			√					√		2
<b>Totals</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>5</b>	<b>42</b>



- Research-related family, travel or previous educational experiences, were themed as **internally referenced**.
- Research-related examples linking to named books, exhibitions or artists, were themed as **externally referenced**.
- Often vivid accounts of students “*thinking about their research experience*” by citing aspects of practice, criticism or knowledge-creation, were themed as **research processes**.

The mean of instances offered by each student was 3.8. Seven students recounted experiences under two of the three emerging themes and four under all three. Or to put it another way, these 11 participants’ experiences of ‘research before university’ seemed to have significant elements in common, despite deriving from very different places.

As the researcher analysed the textual data, the richness of each student’s prior learning experiences emerged. For reasons of space edited single extracts are cited below, alluding

sometimes to themes 1 and 2, but mainly exploring theme 3 **research processes**.

These four descriptions in Table 3 below capture students undertaking and reflecting on informal, personal and practical pre-university inquiries; three around photography, one planning travel. To an extent each also relied upon personal or familial ‘research capital’ e.g. access to technical equipment, information technology and skills, having sufficient resources to travel and perhaps most crucially: feeling confident about learning.

The descriptions in Table 4 on the following page highlight students’ apparently more formal prior learning about their undergraduate discipline. Together with the previous four they raise a key question.

**Table 3**

***Illustrative extracts describing pre-university research processes (Theme 3): Practice***

Student ID/image	Research processes (practice)
St1 <i>Personally-taken monochrome photo of an eagle</i>	“I was on a family trip - suddenly I see this eagle coming right at me - I start increasing the focal length, shutter speed simultaneously and setting the aperture. The picture came out good although I was 200m from the eye of the eagle. BAAMM!!!”
St6 <i>Personally-taken colour photograph of a multi-deck cruise liner</i>	“Prior to this incredible holiday in 2012, I conducted (with the help of my dad) research into different areas we were going to travel to. We looked online at tourism websites and through books ... to create a plan of the sites to see and capture, as well as the activities/tours available.”
St7 <i>Personally-taken, photo-shopped colour image resembling a lino-print</i>	“I had taken this picture back in India before university ... a tree picture with pink leaves. After some time I thought to do something with this picture. So I searched several photographers’ work and got to know one who works on images by adding minimal effects. I used Photoshop to imitate this.”
St8 <i>Personally-taken colour photograph of a horse and rider</i>	“Before this shoot in 2016 I had been a very point-and-click photographer - focused on the horse and rider and ignoring the space around me. However after a while I noticed how the fence framed the horse at certain times in the ring. This use of depth of field allowed for the horse to stay in focus while adding another layer to the image.”

**Table 4**

**Illustrative extracts describing pre-university research processes (Theme 3): Criticism**

Student ID/image	Research processes (criticism)
St3 Screenshot of Testino's 'Towel Series'	"I was exploring the lighting techniques of 20 <sup>th</sup> century iconic black and white photographers. I looked at harsh contrasted B&W photography and the 'towel series' to research Testino's use of softer, more intimate lighting techniques."
St9 Personally-taken colour photograph presenting abstract images	"My photo was part of an Identity project in 2016. I had never done much experimentation with photography in a fine art approach. The double exposure was semi-intentional with the 'imperfect' overlaying, composition and vignette edges ... inspired by Man Ray's photographs"
St11 Monochrome self-portrait photographed by Francesca Woodman	"At 'A' level I did in-depth artist research on Francesca Woodman: her early life, parents influence, education and fascination with photography. I really like this particular image because the long exposure highlights Francesca's movement ... a mirror allows the viewer insight into what she sees in her reflection."

**Table 5**

**Illustrative extracts describing pre-university research processes (Theme 3): Knowledge-creation**

Student ID/image	Research processes (knowledge-creation)
St2 Colour screenshot - National Portrait Gallery exhibition page	"I find exhibitions are a better way of researching an artist, compared to the internet, as you are seeing their work in person. An exhibition is completely true to the artist and what they believe in."
St4 Screenshot of a monochrome 1976 image in a book	"I used this book during 'A' levels to read case studies, as I had to write an essay based on photographers' work and lifestyle linked to my own. Getting an insight into other photographers' work allowed me to explore more options within photography."
St5 19 <sup>th</sup> century monochrome photo of an Indian palace (from a book)	"This image was one of the first taken in India - part of a London exhibition 'The New Medium: Photography in India 1855-1930'. For me it is a history of my country. It is so exhilarating - it also gives an idea about what photography was like in that era."
St10 Personally-taken monochrome photo of a building	"For my Level 3 extended diploma project I researched and experimented with pinhole and camera-less photography... processes like cyanotype, chemigram, luminogram, photogram ... I enjoyed pinhole photography because I had more control. I could make a small or large camera and get different results."

How as higher educators should we acknowledge the extant learning of students arriving into undergraduate degrees: either those with positive, potentially useful experiences like the seven individuals above or, as academics' vividly describe in the previous section, the many students without them?

These last examples in Table 5 link to and build on the internally and externally-referenced themes in Table 2 above, by describing first-year undergraduates creating personal, pre-university knowledge using exhibitions, books, historical and experimental processes.

Together the 11 accounts suggest that only seven weeks into their degree all these students already held tangible, if sometimes tacit, senses of what research in their discipline involved. That analysis was then further reinforced by interviews with three students from that module group: St 5, St 10 and St 12. Interviews happened just after the above task's completion, but six weeks before the researcher saw its outcomes.

### *Biographical interviews with three students: data source 6*

Data from these biographical interviews indicate that the texts analysed above were if anything, a thinner version of the interviewed students' pre-university experiences. The first interviewee (St12) had not even completed the task prompting data source 5, yet described similarly rich, research-related learning experiences. At college she found "the research part [of psychology] really interesting" especially "different ways in which they presented the research, not just written but graphs." Photography 'A' level "was amazing, all the free equipment we were allowed to use". She also described paid work before and outside of university, recruiting panel members for market research: "They want ten people who drink Coca-Cola and ten that don't. We have to make sure they know exactly the right Coca-Cola that they are drinking - and research the product online to ensure all the details are correct."

St10 also described recent research experiences at a local further education college in overwhelmingly positive terms. He had been taught how "primary research is something we had to do ourselves - secondary research is somebody else's work." Independent learning was prioritised:

It was pretty much on you the student to find and research the major figures in that part of your skill set ... to build up a kind of portfolio of skills and techniques that you have

researched and developed through experimentation and research.

His experience reached beyond classroom or internet-based learning: "I've done research going to Tate Modern - going in and out regularly." A week-long summer school, facilitated by college two years before university, had been especially formative. It included experimental shooting with monochrome film on a 35mm camera: "That really encouraged me. I had not done that before - it was fun to experiment." Meanwhile, St5's positive attitudes towards research reached back into childhood; asking her mother endless questions and "loving research topics" at primary school.

The two interviewees who had previously attended colleges, nevertheless perceived university as research-rich. St12 recalled having just "standard textbooks so I did not actually research outside of the textbook." Yet university was teaching her "Harvard referencing and all that kind of stuff" alongside "research and writing essays." Previous library usage had been mostly internet access, not borrowing books. "But I definitely like this library here ... lots of photography books, really good ones. You can see the artist's sketchbooks." St10 similarly described how "They did have books at the college but I didn't really look at them much."

Returning to St5, unexpectedly (to the researcher) she also revealed recently gaining a previous undergraduate psychology degree in India. During that degree she had a highly active research experience:

We did not have to conduct research by ourselves but we were part of it because we were assisting our professors. We used to collect data from people, and double check it at least three or four different ways. Then we would go back to theories and decide how relevant it is to that theory. And we learned how to write papers and keep track of the data.

Her account is perhaps classifiable as ‘research-based’ learning (Healey & Jenkins, 2009, p.9):

When you study for a degree and you do research, you become more responsible. If you do research on your own you can be quite flexible. But when you actually have to do it academically you need to be very precise. So you know research for me, it is really important.

## Concluding observations

The 12 students volunteering in this study may have done so because, derived from prior education or family and social backgrounds, and as suggested by the data above, they already perceived something of themselves, their experiences or aspirations in the term ‘research’. Equally, the 12 abstaining may have had reasons already to have felt excluded or disinterested e.g. low self-confidence, perceived lack of cultural or educational capital, uncertainty about ‘research’.

As with all research, this project has limitations. A larger-scale study could monitor potential relationships between commencing students’ attitudes to research and their familial, social or educational backgrounds. It could also consciously address an interesting question: How much might previous studies about undergraduates’ learning through and about research be skewed, because volunteers in such research are likely to be more positive about it: either for the reasons explored above, or others we may not yet realise?

This article’s empirical perspectives draw from higher educators across one university, its student perspectives from within one discipline, yet both are grounded in rich evidence. From a small set of participating students come messages of general positivity about prior experiences, and from a much wider set of academics, caution. Both raise challenging questions for all practitioners around first-year undergraduates and research. In the spirit of

‘transition pedagogies’ (Gale & Parker, 2014, p.748):

- Is educational transition sufficiently resourced by universities *to help first-year undergraduates individually to understand what and why they feel or do not feel confident about, and already know or do not know*, about research?
- Is ‘learning how to learn through and about research’ *progressively and sensitively designed into* undergraduates’ teaching, curricula, learning and assessments, across first-year and subsequent experience?
- Do individual students’ previous research experiences and personal educational capital, or lack of the same, *actively inform the ongoing development of the teaching and curricula that should help ALL first-year undergraduates to learn early, and deeply*, about what ‘research’ means at university?

Although these are reasonable educational questions, introducing research or inquiry-led tasks, especially into degrees that students perceive as vocational, can challenge and discomfort first-year undergraduates (Wood, 2010). A longitudinal study of undergraduate students arriving from further education colleges in a Scottish university highlighted “the importance of students’ prior learning experiences to understanding their dynamic transitions to and within university” (Christie, Tett, Cree & McCune, 2016, p.483). The researchers emphasised that students arriving at university “are not a blank sheet” (p.488). Yet too often perhaps, in terms of previous learning about research, ‘blank sheets’ is what educators in many disciplines mistakenly assume new undergraduates to be.

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