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Problematizing the 'Career Academic' in UK construction and engineering education

Pilcher, Nick; Forster, Alan; Tennant, Stuart; Murray, Mike; Craig, Nigel

Introduction: current contexts and concerns

In this article, we understand 'system' as the UK Higher Education system in its education practices and policies from central government, their implementation by management and Human Resources (HR), and their influence on student experience and teaching team dynamics. We understand 'Career Academic' as someone pursuing academia as a Career, seeking promotion and professional longevity via administrative, teaching, but primarily through high quality research publications, grant funding and evidence of impact (Barr, 2008, Tennant et al., 2015). These academics have little or no meaningful industrial experience related to construction and engineering. By industrial experience, we mean working professionally and practising in either public, private or the charitable sector. . For UK institutions, Career Academics are highly appealing. Their increased prevalence is a product of circumstance in response to the UK Research Assessment Exercise (RAE) / Research Excellence Framework (REF) and accompanying performance metrics, and they are best placed to maximize research income in the UK's now heavily enterprise and consumerism focused HE sector (Regan, 2012).

In the United States, even without a government REF, such individuals can enhance their tenure and associated salary and employment benefits (Sykes, 1988; Lewis, 2007; Goldberg and Somerville, 2014). Worldwide, Career Academics appeal given their potential and expectation to produce high quality research publications, attain research council grant funding and supervise PhD students. Yet, as is noted in a UK context, rarely are they incentivised to gain industrial experience, or have opportunities or willingness to do so, instead dedicating themselves to research (Porter, 1991, Buckley et al., 2015). Academics with little industrial experience are also not individuals with whom industry feel they can work (Dowling, 2015), perhaps due partly to lacking common language or failing to readily identify with practice. Previously, industrial secondment schemes existed to give "first-hand experience of an industrial environment and knowledge of current industry practices…..improv[ing] the quality of industrial relevance of their teaching" (Royal Academy of Engineering, 2015). Nevertheless, , when Career Academics do undertake such schemes, they may arguably be attempting to contextualise their own research rather than acquire knowledge for teaching.

For some time, in the UK, it has been argued construction and engineering educators increasingly lack, but need; industrial experience (Porter, 1991, Graham, 2015). Indeed, the Royal Academy of Engineering (2014, p.21) highlight that "HE appointments are often driven by a need to improve the research profile of an institution and many academics are

recruited on their research track record." Yet, construction and engineering is a broad field with fragmentation of specialist areas of practice. This is also true for construction and engineering professionals with their own specific specialist functions and areas of practice. Educational support reflects these specialist areas and correspondingly requires input from those with industry experience. Yet, how construction and engineering education is delivered in UK HE has changed.

In the 18th and 19th centuries, site based artisans learnt experientially on a daily basis (Kealey, 2008). For some, night-classes, typically at Advanced Colleges of Technology, supplemented practical knowledge with theory (Kealey, 2008). Educationally, this was called the dual voluntary system (Snell, 1996), where experiential learning constituted the primary, or first order, educational focus (Snell, 1996). Conversely, today's primary educational focus in the UK is theoretical, albeit delivered consistent with professional bodies' competency based Chartership requirements[1]. Some students follow internships, but most supplement this post-graduation by experiential learning via construction and engineering companies' structured training agreements or work-based learning. For other students, during their undergraduate education, it can be placements, sponsorship, part-time or sandwich courses, or distance and online delivery provide such experience.

Historically, for the student experience, learners initially received 'first' hand industry practice, and more recently 'second' hand accounts through their tutors' storytelling. Today, with current emphasis on recruiting Career Academics, many UK students only receive 'third hand' accounts from lecturers with no industrial experience albeit who may draw upon industry literature or visit construction and engineering project sites.

In the UK in the 1980s (Horne, 1983) initial concerns that HEIs should require lecturers to have practical experience (Graham, 2015) grew. By the 1990s, construction and engineering academics with limited or no practical experience were becoming prevalent, with adverse implications for teaching (Barr, 2008). Recently, such arguments have increased (Barr, 2008; Alplay and Jones, 2012; Graham, 2012; Westacott, 2013; Tennant et al., 2015), with declining numbers of academics with relevant industrial or practical experience (Royal Academy of Engineering, 2014) now a great concern (Arlett et al., 2010). It is one of many "faculty shortcomings", with significant "variation in teaching skills and student understanding" (Alplay and Jones, 2012, p.615). Today, many new UK appointments have

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[1] amongst others; Royal Institution of Chartered Surveyors (RICS), Chartered Institute Of Building (CIOB), Chartered Association of Business Engineers (CABE), Chartered Institute of Building Service Engineers (CIBSE), and Institution of Civil Engineers (ICE)

"little or no practical experience" (Clarke, 2012) due to "increased pressure on research output" (Graham, 2012, p.16; *cf.* Collins and Davies, 2009; Bekhrandnia, 2016). Furthermore, in teaching team contexts, inexperience can create inequalities in teaching distribution through a lack of expertise, with students adversely affected (Vinney, 2016). This is especially pronounced given drives for greater multi-disciplinary approaches to teaching, i.e. design projects / interdisciplinary working favoured by professional bodies aiming to simulate real life. Ironically, these attempts to simulate real life are often staged by players with no experience of site-based construction and engineering itself. Career Academics arguably struggle to orient and meaningfully engage with holistic project content that typifies multi-disciplinary work. Subsequently this can impact on team dynamics and perceptions of course strength if Career Academics lack relevant experience to deliver existing modular content in accordance with professional accrediting bodies' requirements. Moreover, greater likelihood of syllabus and staff drift (Kyvik, 2007) exists as Career academics regress to favour educational components they are comfortable with. This disconnects disciplinary knowledge from employability and life-long learning attributes that are best introduced into the curriculum in parallel, through contextually rich case studies and problem-based learning (Kamp, 2014).

In this polemical position paper, we complement the literature by providing an in-depth problematization of the Career Academic considering benefits and shortcomings of these trends in UK construction and engineering education. To inform our paper, the research approach adopted largely relies upon an extensive literature review and considered analysis. The paper is not, we stress, a critical exploration of individuals working in the UK HE system, nor a critique of research. Research is, ultimately, a key goal of universities driving knowledge forward. Instead, the paper discusses the concept of the Career Academic in construction and engineering within current UKHE. It does so around three inter-related areas: their institutional appeal; their impact on the student experience, team dynamics and broader academic functions and; current strategic policy to employ them in response to government strategy. We generate questions for policy makers, institutions, and those entrusted with implementating strategy. Such questions have relevance for the UK but also, we argue, for a wider European and Global context given their focus on issues associated with research on educational strategy, and the importance of academic drift to the field (e.g. Denmark (Christenson and Erno-Kjolhede, 2011)) and more widely (e.g. Neave, 1979).

One: the appeal of the Career Academic to individual institutions

For HEI's in the UK, Career Academics are appealing. They bear the promise (or if experienced, manifest evidence) of research funding in line with current UK government HE funding policies (Willetts, 2010). For HEIs research portfolio benefits extend beyond funding; research success aids prestige, status and league rankings, which lucrative international students often base institutional choices on (Graham, 2015). Understandably therefore, certain elements of strategic decision makers principal focus for appointment, as is evident from reviewing job advertisements, is 'essential: PhD, significant research publications and research grant income', and 'desirable: relevant and extensive industrial experience, and chartered status'. Indeed, Career Academics have many qualities industry trained practitioners lack.

Qualities of career academics for individual institutions

Career Academics manifestly have PhD education attributes of specialised knowledge, critical thinking, and in-depth evaluation skills for complex interconnected problems (Greenfield, 1996; Phillips & Pugh, 2010). They understand (and probably accept) the shared beliefs (Harari, 2014) underpinning research. A PhD is asurrogate apprenticeship (Park, 2005) in research mechanics and methods (Knight and Ruddock, 2008). Research-oriented minds arguably explain complex subject matter at fundamental levels (Demski and Zimmerman, 2000). Indeed, Greenfield (1996:3) suggests research is "an art aided by skills of inquiry, experimental design, data collection, measurement and analysis… interpretation, and… presentation". Such skills support attaining transformative research funding council grants and help individuals gain understanding of tacit and expressed 'networks' in specialist subject areas.

Secondly, PhDs are symbols of strength, value and academic authority in an education service industry. They have significant employment capital given their symbolism of the highest academic attainment. Although PhDs may not prepare academics pedagogically, new UK staff must complete a Postgraduate Certificate in Academic Practice (hereafter PGCert) arguably enhancing pedagogical knowledge and helps understand student learning.

Thirdly, productive Career Academics can be highly motivated given that academia has traditionally carried a certain permanence compared to industry, especially project-based industries (Kalleberg, 2000), and has more flexible working conditions. Also, social prestige in academia, "particularly the role of determining the life chances of others" (Hansley and Trow 1971, p.204) can be perceived greater than in industry. Classic management theory

states workers respond to rewards (Griffin, 2013), and academia offers financial gain and rewards through senior promotions, whether, invariably, by research (Graham, 2015), or teaching routes (Macfarlane, 2011). For institutions, Career Academic recruitment ostensibly delivers good research and increases institutional ranking (Graham, 2015, Guardian 2015, Complete, 2015). In turn, students choose institutions by these metrics.

Thus, institutions arguably recruit Career Academics in line with the principal assertion represented in Figure 1, although we note for purposes of clarity and to support the principal argument being made here, other impacting factors and assumptions have been omitted.:

Insert Figure 1 here

Notional and typifying features of the industrially experienced lecturers

Yet, despite these assumptions, and advantages Career Academics offer, those with industry experience, practical academics, or 'Pracademics'(see Andrew et al., 2014 p.76 for a reference to pracademics in nursing education) also offer many advantages. Professional chartership (RICS, 2015; CIOB, 2015; ICE, 2015) signifies many competencies, and although universities have many professionally qualified staff, few have any lengthy exposure to industrial experience and have often chartered via academic routes. The situation is not binary, and some staff working in UK universities have significant industrial experience. Yet, such staff were ostensibly employed before UKHE recruitment became REF focused. Whether such staff would attain employment today when compared to the Career Academic is highly questionable. This has, we argue, an adverse impact upon construction and engineering education given the ability of such staff to bridge theory and practice.

Firstly, those with lengthy industry experience have the learnt knowledge grounded within professional employment contexts that acculturates individuals to workplace norms and practices (Hasluck and Hogarth, 2010; Gainsburg, 2015). Industry experience provides tacit knowledge of manual and cognitive dexterity components, trade socialisation (Snell, 1996), and managing random and unexpected events (cf. Gainsburg, 2015). Such aspects can only be achieved through experiencing (cf. Kolb, 2014) deep learnt industry practice and gaining industrial chartership. Even though industry experience may become outdated, (notably in technology advancement, and changing legal and contractual aspects), the ability to operationalize tacit knowledge into context for students is key (Gainsburg, 2015).

Secondly, extended industry experience of regular interaction with industry personnel at various levels helps develop interdisciplinary communication, leadership, and negotiation

skills (Gainsburg, 2015). Such skills are hard to master given potentially confrontational dialogues when work has not met expectations (cf. Schein, 1970). Indeed, accessing industry in apprentice or professional capacity is often associated with shifts in student learning paradigms, something exciting, stressful, and undoubtedly a formative, if not transformative experience.

In HE contexts, such experience and knowledge is highly beneficial. Firstly, regarding pedagogy, a PGCert assists with course design and delivery, and institutions 'value skills and achievements in relation to education and pedagogy alongside research outputs' (Fung et al., 2017, p.10). However, it cannot give the experience for lecturers to contextualize their teaching (Lamb et al., 2010, Gainsburg, 2015, *contra* UKgov, 2015, Johnson, 2015). Industry experience gives lecturers anecdotes and narratives to share with students about workplace realities (Broome and Peirce, 1997; Gainsburg, 2015), and garners them respect from students (Christensen and Erno-Kjolhede, 2011). Such lecturers can act as 'role models' and social conduits to the realities of practice, softening the transitionary 'shock' to working life and are aware of the ethics of industrial professional practice (Singh, 1992; Kamp, 2014; RICS, 2015a). They can 'prime' learners for what they may confront (Gainsburg, 2015) and are much more than 'disciplinary connoisseurs' simply transmitting knowledge to students (Henard and Roseveare 2012). Arguably, teaching and learning strategists would prioritise such knowledge and skills, and do readily endeavour to imbue employability attributes, but also help 'students to transition from the identity of a student towards that of a graduate worker and citizen' (Artess et al., 2016, p.7) Indeed, these factors have recently been highlighted in the government Higher Education Bill incorporating a Teaching Excellence Framework (TEF) that claims to prioritise employability, student satisfaction, and embedded skills (Parliament, 2017).

Furthermore, such lecturers have strong industry links that can inform teaching, develop connectivity, blend theoretical and practical based research, and help with employability that 'have become an integral part of recruiting new graduates' (High Fliers 2016, p.23). Work placement schemes have many benefits; they contextualise learning, and companies can evaluate potential candidates for employment. Such schemes could be associated with key employability and soft skills, and confidently producing industry ready graduates. Employability statistics are key performance indicators in the National Student Survey (NSS, 2017; cf. Universities UK, 2010). Although many current university schemes utilize alumni contact details to link current students with the workplace, these relationships are not as direct as with lecturers.

Regarding research and teaching links, Boyle's (2010, p.3) research for the Quality Assurance Agency (QAA) recommended research-teaching relations should help develop research-type graduate attributes, albeit his review did not show a "natural link between research and good teaching…it shows that the links need to be explicitly created". Although "it is difficult to identify conclusive evidence of the research-teaching relationship" (Russell Group, 2015, p.30, cf. Stappenbelt, 2013) arguably, more Pracademic type staff can better articulate such research. Arguably, the drive towards research creates detachment by removing industry links from academic promotion, and discouraging industry keeping links with academia (Dowling, 2015). Indeed, the shifting educational focus to employ Career Academics has been criticised by bodies such as the Royal Academy of Engineering (Graham, 2015).

There is arguably a symbiotic relationship whereby professional bodies need the universities and *vice versa* and these institutions accredit programmes. It has however been argued that such accreditation is done "perfunctorily or by rote" (Uziak et al., 2013), perhaps, we suggest, to satisfy accreditation criteria per se for Quality Assurance mechanisms rather than for industry. Indeed, "quality assurance systems do not build quality, they build procedures that claim to measure quality" (Allais, 2011, p. 251).

Thirdly, other key university functions are potentially debased by an absence of relevant practical experience. For Recruitment and Admissions, any accredited courses must "meet the quality standards established by the profession for which it prepares its students" (JBM, 2015, npg) and are often expressed as starting a lengthy and transformative journey. The 'good' degree aids meaningful employment in relevant construction or engineering companies, and structured training agreements, successfully completed and assessed, lead to chartered status. The engaging Pracademic can readily convey their personal career path, give credibility to university recruitment processes, and validation to programme content. To lecturers with significant industrial experience, story telling may be second nature (Broome and Peirce, 1997): connectivity with syllabus is readily applied to projects and work place environment.

Moreover, such connectivity can help with providing information at open days and externally facing university activities. Importantly, Pracademics can meaningfully achieve many tasks; i) Inspire and engage prospective students upon initial contact, with subject and professionally specific industrially contextualised discussion ii) Satisfactorily explain the prospect of professional roles in construction and engineering with the benefits offered (financially, job stimulation, employment longevity); iii) Explain the role and functions the

qualified professional typically undertakes; iv) Discuss based around reciprocal relationships between students and universities, and the symbiotic role of universities and professions via accreditation; v) Answer industry and course specific queries, course content and professional accreditation.

Individual UK institution strategies to compensate for non-industry experienced lecturers

To compensate for lacking staff with lengthy industrial experience, individual institutions have adopted numerous reactive and proactive strategies. Firstly, some have sought assistance from 'subcontractors' ('vis-à-vis' visiting teaching fellows/professors and adjunct professors) who are "hands-on practitioners and can relate and apply teaching material to operational issues and real–life problems that graduate engineers may face when entering industry" (Royal Academy of Engineering 2015). Adjunct professors/studio tutors are readily utilised in 'architectural' education and typically qualified chartered architects working mostly in architectural practice. However, within a construction and engineering context such avenues have rarely been explored in the UK. Dilute forms have utilised guest lecturers but these are often disconnected from broader syllabus requirements and frequently revert to established presentations used by practitioners that may not readily support the topic..

Furthermore, as adjuncts do not support broader programme functions such as administration and supervising dissertations, problems may arise. Also, adjuncts' lack of permanence means challenges for invoking emergency cover measures may occur, especially without a 'pool' of adjunct professors. In addition, strong alumni and industrial links require continual nurturing to ensure retention of valued external temporary appointments. Arguably, such links are best forged and maintained by Pracademics, who more comprehensively relate to the workplace realities faced by industrialists.

Based on the above we would suggest some key questions (see table below) the answers from which may help teaching and learning strategic direction and development, especially when seen within a TEF context.

Insert Table 1 here

Two: The impact of the Career Academic on the student experience

Recent UKHE policy claims to put 'students at the heart of the system' (BIS 2011). This involved introducing full fees, so students are now buyers, or consumers, of education. Increasingly, however, students are taught by Career Academics who prioritise research over teaching, and strategic decision makers also prioritise research and not teaching (Royal Academy of Engineering, 2014). Attempts to redress this disparity by prioritising teaching through a TEF focus on pedagogical delivery alone (Parliament, 2017) do not consider the value of practical experience. A key motivation is to allow universities to charge higher fees (Johnson, 2015), but in isolation this will not redress the lack of industry practice. Although students base HEI choice on overall ranking (Spacial Economics Research Centre, 2013), they arguably pay more attention to components in these guides (e.g. Complete, 2015) such as 'Entry Standards', 'Student Satisfaction', and 'Graduate Prospects' rather than 'Research Quality'. Additionally, Universities UK (2010) rank demand for 'safe employment' as the key factor in course choice. As a recent survey (N=15,129) notes:

"Overall, the priorities for students are that staff have received training in how to teach and possess professional/industry expertise, with around 40% of students placing each of those as being of primary importance. Being an active researcher is a lower priority, with over half (54%) of students ranking it third in importance." (Buckley et-al 2015 p.30)

Research bias and its impact on the student experience

Land and Gordon (2015) note that in UKHE in general, "the elephant in the room, certainly in the UK, and most probably in many other higher education sectors, is the financial disparity between research excellence and teaching excellence" (Land and Gordon, 2015, p.21). Research is accorded far greater emphasis than teaching (Land and Gordon, 2015). Little appears to have changed since 1971 when Halsey and Trow (1971, p.339) concluded that "researchers can look forward to a readership and can hope for a chair. Teachers cannot realistically hope for more than a senior lectureship". Indeed, many recruitment and tenure decisions are based on research, not teaching (Lewis, 2007), with resource allocation models and promotion decisions aligned (Graham, 2015). Yet, although "a research-dominant culture is by no means universal," (Graham, 2015, p.19) a teaching focused route *per se* is arguably not the solution. Indeed, tensions are evident in the lack of parity in promotions with teaching related professors (professorial teaching fellows), and as Macfarlane (2011, p.129) highlights:

"The notion of a 'teaching professor' is counter-posed, of course, by a 'research professor', an adjective which means, in effect, a 'real' professor. We do not need adjectives such as 'research' or 'teaching' to describe a professor… It is also hard to understand why someone who has achieved recognition for the quality of their scholarship at a national and international level would have been able to do so without publication in peer reviewed outlets. What matters is whether they have achieved the status and recognition, which corresponds with being a professor. The relevant question is simply, are they a distinguished authority in their field? This is what it means to be a professor".

However, currently, such scenarios only exists theoretically. Although decision makers insist the somewhat nebulous concept of teaching excellence is actually considered in promotion (Graham 2015), research is prioritised. This is despite more emphasis now being placed on the Scholarship of Teaching and Learning (SoTL) (see Fanghanel et-al 2015 Graham 2016) and teaching excellence, as stated in much promotion criteria and recent government policy and initiatives (Johnson, 2015; BIS, 2015). We argue for performance parity, that those moving upward via the teaching route need significant evidence, be this pedagogical related publications or evidence according to a TEF such as that currently proposed (BIS, 2015, cf. Burnett, 2015), to warrant promotion. One mechanism could be stipulating teaching staff have higher levels of Higher Education Academy (HEA) fellowship. For example, lecturers should attain Fellowship of the HEA; Senior lecturer, Senior Fellow; and professor, Principal Fellow. Furthermore, a significant body of peer reviewed publications in academic teaching and pedagogical areas of practice. Clearly, for professorial fellow appointments, appropriate international recognition via invitation as editor of leading educational journals and the attaining of education based grant income would be expected. Whilst this may seem excessive, it attempts to bring in line the expectation of a research focused academic staff member's requirements.

This is urgently required given teaching's perception as undervalued second tier in construction and engineering (Graham, 2015) and elsewhere in the sciences (Savkar and Lokere, 2010). In engineering, students have been found to feel staff value research more than teaching (Alplay et al., 2008). Such a culture is then perpetuated; Early Career Researchers (ECR) comment on receiving valuable career advice from experienced colleagues to prioritise research, not teaching (Graham, 2015). Barr (2008, p.20) notes what

could be the logical conclusion: "in due course, civil engineering degrees will be taught in many universities by a team of academics without much industrial experience, which may not prove good for the profession." This does not reflect what students want (Buckley et al., 2015), and even if teaching is promoted, it still fails to compensate for a lack of industry experience.

The construction contextualised Pracademic

Arguably, if students are taught by Pracademics rather than Career Academics, the student learning experience is much enhanced (Buckley et al., 2015). Indeed, "across type of institution and irrespective of seniority, faculty with industrial experience spend a greater percentage of their time on teaching… are less likely to think about changing jobs to spend more time on research, and are less likely to believe that publishing should be the primary criterion in promotion and tenure decisions" (Fairweather and Paulson, 1996, p.209). Although Pracademics will not automatically deliver better student learning experiences than Career Academics, many students seek to learn from 'real-world examples' (Collins & Davies 2009, p.13, cf. Broome and Peirce, 1997, Guardian, 2014, Dowliing 2015, Alplay et al., 2008), and these can drive epistemological change in students (Gainsburg, 2015, cf. Fry et al., 2008), engage, and help retain students (Crosling et al., 2009). Pracademics can inform students where theory will or will not apply, and can draw on stories of legal challenges, worker error and interactions with clients to impart understandings both of discrete engineering concepts and of the overall profession (Gainsburg, 2015, cf. Broome and Peirce, 1997). Such qualities and abilities are valued by students in other European countries as well (e.g. Denmark (Christensen and Erno-Kjolhede 2011).

Many construction and engineering course modules (e.g. construction technology, construction process management, and site establishment) would undoubtedly benefit if Pracademics delivered them, through contextualizing their practical experience of industry, daily problem-solving, and stressing soft skills such as adapting communication and language to multiple audiences (Gainsburg, 2015). Notably, "engineering teachers help engineering students achieve heroism: inwardly, by telling the stories of heroism in the practice of engineering; outwardly, by conditioning their learning experiences for heroism" (Broome and Peirce, 1997, p. 51). As a recent report from the University of Delft notes "Interacting with modern engineering professionals in design or research projects is the key to providing students with the role models for their future and exposes them to real-world professionals and the problems engineers face every day (Kamp, 2014, p.33). In Spain as well, recent

research calls for a greater need to engage engineering students in more practical industry focused work to prepare them for employment (Fuentes-Del-Burgo and Navarro-Astor, 2016).

Yet, disengagement from students is often noted (e.g. Porter, 1991, Singh, 1992, Royal Academy of Engineering, 2014), and is arguably due to UK government policy. Significantly, in vocational subject areas such as law, the medical profession (Uziak et al., 2013) and nursing (NMC 2015) links with the professional environment remain much stronger. Although in areas such as Nursing there is also a staff drift (cf. Kyvik, 2007) toward research, this has arguably not been to such a degree whereby practical experience has almost been completely sacrificed. Recent UK government exhortations (e.g. Johnson, 2015) and initiatives (Parliament, 2017) to improve teaching quality through a Teaching Excellence Framework (TEF) arguably focus on the wrong target of teaching as the mechanism to permit institutions to differentiate tuition fees. They miss the correct target of employing an optimum balance of industry practitioners and focus on purely pedagogical issues drawing on current existing mechanisms such as the NSS for their data. Further, such initiatives would not be centrally funded, something noted by the National Union of Students (Guardian, 2015a).

Pracademics are arguably key. In construction and engineering fields, it has been stated that the most fundamental question that can be asked of a student is 'Do you want to build?' Most practitioners refer to rewards of creating something of permanence, a legacy, leaving something for posterity. Arguably, Career Academics similarly want to leave a legacy, but of publications rather than teaching (Hills and Lingard, 2004). Conversely, Pracademics will be more focused on teaching and instilling an enthusiasm of industry into students, to better prepare them for work. Only Pracademics could involve students in "Learning-by-doing-(together) in real-world, authentic problems and encouraging risk taking [which] must become an important aspect of future educational programmes" (Kamp, 2014, p.22). Furthermore, recent recommendations (Fanghanel et-al 2105, p.9) would suggest faculty cultures that promote Scholarship of Teaching and Learning (SoTL) could promote and recognise Pracademics engagement in their own disciplinary and pedagogical research, and be REF returnable.

Evidence of the impact of these changes on the student experience:

Evidencing impact on the student experience is highly complex. The generic 27 questions in the National Student Survey (NSS, 2017) afford no level of in-depth analysis, nor are the richer text-based supplementary student comments publically available for scrutiny. Feedback, instead of currently being sought from students' in their final year of study, should be sought five, ten and even fifteen years after graduation (Beard, 2012). If students are taught largely by Career Academics, only when they encounter the workplace will they know how theory relates to practice.

One indirect approach to provide evidence related to student perceptions of being taught by Pracademics is considering other subjects, for example Nursing. Despite an increasing focus towards research and requirements for lecturers to have a PhD, The Nursing and Midwifery Code of Practice is very clear that nurses who intend to teach at HE level must "be registered in the same part or sub-part of the register as the students they support" (NMC, 2015, p.33) and have completed "at least three years post-registration experience, gained additional professional knowledge and skills, and have experience in an area where students are gaining practice experience relevant to their registration" (ibid). Furthermore, they should have "extended their professional knowledge, relevant to their field of practice, to at least first degree level, prior to undertaking an NMC approved post-graduate teacher preparation programme" (ibid). This practice is normal in health professions where "the majority of lecturers in health professions take up their academic posts having developed considerable clinical professional expertise" (Smith and Boyd 2012, p.64).

Such 'link' lecturers connect practice and theory and contextualise learning within practical arenas they have personally experienced. They "create reality" (Bentley and Pegram, 2003, p.172) for students and maintain credibility through their foothold in the practical clinical area. This helps "ensure lecturers are legitimately able to facilitate students' learning in the classroom, particularly the theory and practice of clinical skills" (Young et al., 2012, p.42). Others "highlight the link lecturer role in supporting students, participating in assessments, supporting mentors and maintaining clinical credibility" (Collington et al., 2012, p.924). Such a role constitutes 20% of lecturer time (MacIntosh, 2015) and helps integrate "theory-practice as dialectic through interplay between academics, practitioners and students" (Chan et al., 2012, p.1038). Thus, in Nursing, links with the practical arena are key, help contextualise learning, and gives lecturers credibility. Moreover, Nursing lecturers also produce research and are returned for REF. Nursing is not alone in having such links, and in the medical profession and law (Uziak et al., 2013) such links remain strong. Conversely, in engineering and construction they are being challenged.

Given such trends look set to continue, and student tuition fees are likely to increase, in construction and engineering education we foresee a widening gap between consumer expectation, university fees (where applicable), and actual delivery. We represent this in Figure 2:

Insert Figure 2 Here

The RAE/REF line denotes the theoretical reduction in staff with meaningful industrial experience and highlights the main RAE and REF census dates. Alterations in primary funding mechanisms for education are associated with certain points (Guardian 2015b; Independent, 2015, Johnson, 2015), namely, £1,000 (1998), £3,000 (2004) up to £9,000 (2010) increases in line with inflation and according to TEF results to upwards of £9,000 (2017 / 2018 onwards). The Student expectations line denotes the theoretical correlation between fees and expectations. The student acts as a consumer. If fees and expectations are coupled it is logical they will respond according to consumer behaviour.

Consumers hold both explicit and implicit performance expectations, and understanding both is critical to understanding satisfaction. Solomon et al (2014, p.165) highlight that the 'price-quality relationship is one of the most pervasive market beliefs'. Furthermore, according to the 'expectancy disconfirmity model', an important lesson for marketeers is 'don't over promise if you can't deliver' (Solomon et al., 2013, p. 403). In a UK construction and engineering education context, as institutional strategy currently employs Career Academics and this is at odds with student desires and expectations (Buckley et al., 2015), the danger exists this strategy is exasperating a situation at odds with the aims of the TEF and the NSS.

Based on the above we suggest the following key questions:
Insert Table 2 here.

Three: wider institutional strategy to employ Career Academics

For individual institutions, Career Academics are highly appealing, yet from wider perspectives, the policy to employ them can, we argue, have varying impact depending on the type/status of HEI. Traditionally, certain institutions have made extensive new appointments in strategic efforts to improve the probability of higher success in REF (Gibbs et al., 2016), in

moves analogous to sports 'transfer' windows, where Career Academics with significant research portfolios can move to higher calibre (see below) institutions. Yet, REF's response was to enforce regulations on minimum appointment length (or being in post) before census date. It is looking likely, based on the interim report from Stern (GovUK. 2016) that academic outputs will remain with the institution. This will notionally close the academic transfer window and revert to a pre-REF world where academics were employed for their potential. Another significant change may be that every academic staff member with research in their contract will be returned for REF. Concerns have been raised regarding in-post 'contract change' from research to teaching only with the loss of academic status and potentially employment vulnerability. Whilst REF rules will undoubtedly alter, strategic approaches and their possible impacts arguably differ greatly in upper quartile, Russell group institutions as opposed to post-1992, former polytechnic institutions.

Russell & 1994 group (Upper quartile institutions).

Russell Group institutions in the UK are arguably the 'elite' 24 universities, and these are closely followed by a group of 11 prestigious institutions that called themselves the 1994 group. In both these 'groupings', research funding success rates are much greater (Guardian, 2014), and consequently staff generally teach less and research more. Such institutions have refined research infrastructures, both in tangible research facilities (e.g. laboratories) and, crucially in access to extensive networks of high-calibre research focused internal and external academic staff (Russell International excellence Group, 2015; EPSRC 2015). This creates security and provides comfort for funding councils, leading to higher grant success, which subsequently impacts positively on institutional rank in national and international university league tables to appeal to the lucrative overseas student market. Such financial strength and wherewithal can allow institutions to pursue research and also employ practical industry based lecturers and teaching staff for buy-out for researchers. Their 'status' is arguably a powerful attracting force for external engagement participation and willingness for industry collaboration..

Indeed, given the potential refinement and sophistication of the research/teaching model of such institutions, they may be more contextually aware of the implications of their actions. Indeed, to mitigate the accusation of decoupling theory from practice, there is emergent evidence of engaging in alternative recruitment strategies re: industrial experience. For example, some Russell Group / 1994 institutions recruit both career academics and industry experienced lecturers (Pracademics). The former are recruited to focus on the income stream of research, the latter, even if in the minority, to attend to the teaching and

student recruitment income stream, whilst remaining mindful of NSS results. These appointments are made at lecturer and senior lecturer level, and afford the ability to sustain and ultimately enhance professional credibility and currency of programmes and courses offered. There are thus contradictory considerations of research, NSS and employability that may be reconciled by institutions if they are able to do so (cf. Brunsson, 2002). For example, they can free time for researchers by reallocating teaching load. Also, almost all UKHE institutions have entire administrative sections dedicated to the PGCert, and encourage staff to apply for HEA Fellowship (e.g. University of Bath 2013). Most Career Academics are required to be both researchers and HEA accredited. As the system becomes increasingly recursive – heavy reliance on administration, procedure and uniformity, then symbols of competence (such as PhD and PGCert) become key features in the search for customers. Upper quartile Institutions can provide these if they conform to the dual recruitment model, and for them Career Academics function relatively well: they can retain their position, and, even if they often do pursue policies to employ Career Academics alone, they have the wherewithal to employ industrial experienced staff as well.

Plate glass universities – new mid to upper quartile institutions

These 20 HEIs are mid to upper quartile institutions, they generally fall short of the Russell group and 1994 institutions in prestige and calibre, but deemed higher-ranking than former polytechnic post – 1992s (see below). That been said, several are characterised as being Russell group (i.e. Bath & UEA). With the attainment of Royal Charter in the 1960s (most in 1966) the composition of these 20 Higher Education Institutions have worked hard to grow research capacity, whilst attempting to retain core teaching values. Their ability to develop and mature as institutions has been principally undertaken in an unsaturated university market (1966-1992). They pursued aggressive research intensification strategies after the first RAE in 1986, and have done remarkably well regarding research power. The composition of staff employed at these institutions is a natural response to government drivers and they arguably now have cultures that resonate with many accepted features of the Russell and former 1994 group. It is likely, given this situation, there may well have been a significant change in their staff demographic since the inception of the RAE in 1986.

Post-1992s

Post-1992s are former polytechnics which were granted university status in 1992. Their subject areas are frequently vocational and they have traditionally been teaching rather

than research focused. For post-1992s the feasibility and success of pursuing a policy of employing career academics is less certain. Regarding the facilitation of research, this is more difficult to achieve. Tangible teaching implications are unavoidable as post-1992s navigate towards and implement research intensification strategies (Tennant et al., 2015). The relative proportion of income derived from research in upper quartile institutions (arguably twinned with notable significant alumni foundation funding) enable reductions in reliance on teaching income. Funding can be utilised effectively to reduce staff-student ratios, 'creating time for research'. Conversely, post-1992 institutions rely heavily upon teaching as a primary funding source, with a significantly lower income proportion from research council funding. Moreover, Russell Group institutions can, based on their ranking from research, gain significant income from overseas postgraduate recruitment (Times Higher Education, 2017) Given the current 'system' for income generation, the process of transition in post-1992 institutions from teaching focused towards research-led Career Academics presents significant risk. Further, the challenge for Career Academics working in a post-1992 institution to compete with Career Academics in upper-quartile establishments is much greater.

In post-1992s, requirements for teaching, administration, course leadership and so on impede research outputs. Time allocated to research is available but much less than in Russell Group or upper quartile institutions. Thus, post-1992 Career Academics may feel frustrated at being unable commit equivalent time to research and publish compared to Russell Group institution colleagues. Consequently, their commitment may be fragile and they may seek opportunities for employment elsewhere. This promotes a nomadic faculty workforce, where self–interest becomes a distinctive factor (Porter, 1991). Ironically, those who move will be those who can, i.e. those with success (cf. Graham, 2015), whereas those employed as Career Academics who do not produce the desired outputs or income will find moving harder. The results are arguably the worst of both worlds for the institution: it has employed staff who do not produce research and who cannot contextualise their teaching.

The challenge is arguably twofold: one, teaching commitment is typically higher than in research intensive establishments and two, attaining research council funding is diminished due to infrastructural and cultural weaknesses. Indeed, approximately 80% of all Research Council funding is attained by 20% of universities in the UK (Guardian, 2014) in a system akin to the Pareto principle (Vaccaro, 2000). For any institution, major risks are clearly associated with potentially losing course credibility that may occur during the transition.

Disgruntled students become dissatisfied customers, and potentially negatively impact on NSS statistics and other rankings, with palpable concomitant loss of repeat business.

Unfortunately, although some post-1992 universities have chosen to become civic universities, retaining their polytechnic ethos, and focusing on teaching alone, many continually aspire to close the gap in research with leading institutions. Yet, only a few can be 'leaders' in an ever crowded and competitive sector, and strategies employed must navigate the complex issues surrounding resource allocation for research, teaching and administration.

Paradoxically, transition from polytechnic to university status may impact detrimentally upon the institution, and be seen as betraying the polytechnic ethos. Detractors argue that taking institutions away from the original raison d'etre of providing industry relevant, vocational teaching destroys the heart of their competitive advantage over upper quartile universities. The polytechnic's credibility was surely the closely aligned teaching - professional nexus that created industry 'primed', professionally aware construction and engineering professionals (much in accordance with the proposed TEF). The reputational damage of breaking this link by employing solely Career Academics could affect course credibility. Thus, from wider and broader institutional perspectives, although elite institutions have the wherewithal to work within the system and perpetuate and consolidate their positions, the post-1992s do not. In post-1992s, we argue, a non-industry linked and decontextualised student learning experience is often being promoted and followed.

We argue this is significant in creating a divisive system whereby there are those who teach, and those who do research. In a recent report, *Does teaching advance your academic career?* Graham (2015, citing Soyster, 2008, Fairweather, 2008, Felder & Hadgraft, 2013) found "concerns have been raised that research performance appears to drive academic promotion, with teaching playing a more marginal role". Moreover, regarding addressing this problem:

> "The engineering community is well-positioned to take a lead in this transformation. With teaching excellence integrated into the promotions process, engineering education in the UK would be equipped to provide world-leading programmes that prepare graduates for the engineering challenges of the 21st century." (Graham 2015, p.4)

Furthermore, government policy is creating a system where those institutions who pursue a system of employing Career Academics are being forced to transform their institutions into those whereby industry grounded practitioners no longer exist. To encourage

post-1992s to do this in pursuit of government policy, is to encourage them to play catch-up at the risk of losing their identity, employing staff who are unable to attain outputs and feel disgruntled, and impact negatively upon the student experience. In the upper quartile universities, however, this is at a conscious level of following UK research money but may again be forcing institutions to follow government policy that may negatively impact upon the student experience. Based on the above, we would suggest (see table below) these key questions.

Insert Table 3 here.

Conclusion: does the system want what it gets?

This polemical paper has critically explored the concept of the Career Academic within the context of the current UK Higher Education system. The paper is not a critique of research *per se*, nor a call for immediate parity between research and teaching without the need to assure an evidenced-based teaching development route. Instead, the aim is to generate questions regarding how the UKHE system (and by extension other systems elsewhere) is changing, especially in the delivery of construction and engineering education. Over the past two decades construction and engineering faculties have become populated by Career Academics where previously large numbers of industry experienced and teaching focused staff existed. In a wider European context the UK's recent strategies resonate with ideas of academic 'drift'. Throughout we have raised key questions around the three areas of the appeal of the Career Academic to the individual institution, the impact of the Career Academic on the student experience, and of wider institutional strategy to employ Career Academics. We believe these questions merit attention from policy makers, institutions, and researchers. This is particularly poignant given the potential demands of the new TEF, and it seems likely the bias towards employing Career Academics takes us further away from the TEF's aspirations of an enhanced student learning experience. As Kamp (2014, p. 15) has noted, in an engineering context, "the how we teach will become equally or more important than the what and how much we teach."

We believe investigating and considering them will help answer the question of whether the system gets what it wants. We ourselves are unsure of the answer to the question, but worry the current system ostensibly creates a 'barrier to entry' with insistence on the PhD qualification that frequently prevents those with industry experience wishing to pursue a mid-career change from entering construction and engineering education. Paradoxically, it is well understood that links exist between student aspirations to be taught

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by those with relevant practical experience who better contextualise subject material. Yet, this professional recruitment strategy is arguably at odds with a student recruitment strategy that creates 'space' for those who may be deemed 'disadvantaged'.   What we have argued above is that a balanced departmental portfolio with a mix of industrial focus Pracademics as well as Career Academics would recognise the connectivity between industrial and theoretical capital. This would be achieved by shifting recruitment practices to former times when Pracademics were able to apply for and gain lectureships alongside Career Academics. We have also argued that recent government initiatives to focus on teaching as pedagogy per se do not focus on the right target. Additionally, issues surrounding student engagement and retention are shown to be correlated with contextualised learning that is arguably best offered by industry focused staff.   Reactive strategies to support contextualised learning are many but, if well implemented, the use of adjunct professors for key subjects would undoubtedly enhance the student experience.   Furthermore, to carefully consider and investigate the questions we have highlighted above. As Fung et al (2017, p.9) emphasise, 'only a small percentage of students will become university academics. The   students' plans and values concerning their own futures as European and / or global   citizens needs to be considered seriously; they are a source of motivation (Fung et al.,   2017   p.9). We agree, and argue that a   refocus more on the student experience from an industry perspective, will give students more confidence that courses are delivered by those with the necessary experience and professional values. By doing this, and creating a diverse academic staff base, institutions will better be able to engage students, retain students, and create students with industry ready skills. .

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