Manchester Metropolitan University

Saunders, Fiona and Brooks, James and Dawson, Mark (2019) Exploring staff attitudes to distance learning – what are the opportunities, challenges and impacts on engineering academics and instructional designers. European Journal of Engineering Education. ISSN 0304-3797

Exploring staff attitudes to distance learning – what are the opportunities, challenges and impacts on engineering academics and instructional designers.

Fiona C Saunders

School of Engineering, Manchester Metropolitan University, John Dalton Building, Chester Street, Manchester M1 5GD, UK.

James Brooks

School of Electrical and Electronic Engineering, The University of Manchester, Sackville Street, Manchester, M13 9PL, UK.

Mark Dawson

Lancaster University Management School, Lancaster LA1 4XY

Corresponding author: Dr Fiona C Saunders F.saunders@mmu.ac.uk

Word count: 7535 words

Exploring staff attitudes to distance learning – what are the opportunities, challenges and impacts on engineering academics and instructional designers.

Higher Education Institutions often see distance learning as a means of expanding student numbers and increasing global reach and reputation. Much of the academic literature, however, remains focused on the impact of distance learning on students and the technologies that support it, rather than considering the impact on those staff that are tasked with designing and delivering it. We describe a qualitative study across two engineering departments in a research-intensive UK university, which examines staff perceptions of the impact of converting programmes from successful on-campus ones to distance learning. The findings provide a rich picture of the practical concerns that individual academics have over the impact of distance learning on *pedagogy*, on *technology*, on their *institution*, on *students* and on *themselves*. This is an important contribution to the literature that should benefit other engineering departments around the globe who are also grappling with the opportunities and challenges of distance learning.

Keywords: distance learning; higher education; faculty perspectives; faculty perceptions

Introduction

Many UK Higher Education Institutions (HEIs) see distance learning programmes as a means of simultaneously expanding student numbers, offering greater flexibility to students and increasing global reach and reputation across the globe. As a consequence HEI's have sought to convert existing on-campus or blended learning programmes to a more location independent (or distance learning) model. This involves decisions and actions on a number of levels from the strategic (in terms of which curriculum areas to open up to distance learning and how to develop the requisite expertise in terms of technology and infrastructure) to more tactical operational issues of staff resourcing and transition timescales. However, the focus of much of the academic literature remains on the impact of distance learning on students and the plethora of technologies that support its delivery (Ferrer-Torregrosa, et al.,

2016; Isaias, Reis, Coutinho, & Lencastre, 2017; Bozkurt, et al., 2015). Only a minority of studies directly consider the impact of transitioning to distance learning on academic and support staff, and the focus of these studies is typically on a narrow aspect such as staff workload (Bowen, Chingos, Lack, & Nygren, 2012; Tynan, Ryan, & Lamont-Mills, 2015). Technology acceptance (Wingo, Ivankova, & Moss, 2017). Kinney, Liu and Thornton (2012) was the only identified study set in the context of Engineering Education; a study which measured student and staff perceptions of how effectively engineering courses could be delivered online.

While there has been previous work looking at the broader perspective of staff involved in distance learning (Hunt, et al., 2014; Mansbach & Austin, 2018), there are still *"significant gaps in the current research"* surrounding the role of the instructor (Siemens, Gašević, & Dawson, 2015, p. 82). This is particularly true if we aim to examine the broader attitudes of staff towards engaging in distance learning education, in terms of the personal development opportunities that it provides, and how to maximize these in the context of a research intensive university, where the pressure to publish and produce research income remains of paramount importance.

This study makes an important contribution to the literature on distance learning by focussing specifically on the real-time challenges facing engineering academics and instructional designers in two different schools of engineering in a research-intensive institution, when tasked with developing new distance learning programmes from previously existing campus based ones. This qualitative study was carried out within the Faculty of Science and Engineering at The University of Manchester - a research intensive Higher Education Institution in the United Kingdom. Data was collected from in-depth interviews with academics and instructional designers engaged in transitioning existing campus-based

taught MSc programmes across two different engineering departments to a distance learning model. Our primary research question was:

'What are staff attitudes and perceptions towards the transitioning of two existing MSc programmes from a successful campus based model to a new distance learning model?'

In answering this question, we provide Higher Education institutions with the knowledge to better understand staff attitudes towards distance learning, enabling HEIs to foster the right environment for academic and instructional design teams to develop and deliver effective distance learning programmes or other location independent modes of study (such as MOOCs). This is the primary contribution of this paper.

The paper is structured as follows: First, we review the extant literature on distance learning, its advantages and disadvantages and staff attitudes to, and engagement with it. Then we describe the study methodology. Subsequent sections report on the study's findings, discuss the implications of these findings, both for staff and institutions, and proffer recommendations for how HEIs might better support these transitions to distance learning. We conclude with a summary of how the study contributes to the literature on distance learning and explore a number of avenues for future research.

Context and Previous Studies

Higher Education, along with many areas of life, is digitising (Allen & Seaman, 2013; Siemens, Gašević, & Dawson, 2015). This has provided advances in the learning technologies we can use for existing students and allowed ways to reach previously under-accessed markets via distance learning. Whilst traditional didactic class-room delivery remains central to campus-based teaching, the notion of the *sage on the stage* transmitting knowledge from academic to student has come under pressure from alternative and innovative approaches to teaching such as flipped classrooms (Brewer &

Movahedazarhouligh, 2018), active learning (Bonwell & Eison, 1991) and technology enhanced teaching (Saunders & Gale, 2012; Gillie, Dahli, Saunders, & Gibson, 2017). These newer approaches are centred on a more participative form of education (Sfard, 1998) in which students play a more active role in constructing new knowledge. Despite these innovations, one of the weaknesses of campus-based teaching remains its suitability for diverse groups of learners (who may be geographically distant from the campus, or may be working in industry or pursuing elite sporting activities alongside their studies). Distance learning, or location independent learning offers a potential solution to this, as it enables educators to make use of technology to overcome these geographical and temporal barriers, allowing students to study at a time and place that is most convenient for them (Hunt, et al., 2014).

However, distance learning is not without its own challenges, as its implementation is occurring in parallel with rapid advances in globalisation, joint course development, material sharing, and information technology (Watkins & Kaufman, 2003). It is important for institutions to acknowledge that distance learning is a more expansive concept than simply a new mode of teaching; it is an established, distinct field of education with its own underpinning pedagogical philosophy (Levy, 2003). For this reason one of the biggest challenges facing HEIs, who are engaging with distance learning is to start from a pedagogical perspective, rather from issues of infrastructure, policies and budgets (Minnaar, 2013).

In this paper, we use Simonson's definition of distance learning as "*institution based, formal learning, where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources and instructors*" (Simonson, 2016, p. 212). Furthermore, we use the term on-campus as the antonym of

distance learning, referring to the traditional model of Higher Education. For further

distinction of the differences between eLearning, distance learning and related terms see

(Moore, Dickson-Deane, & Galyen, 2011)

••

Pedagogy, Technology, Institution and Student

Industrial scale technological change has resulted in a profound shift in the very

notion of a HE institution. Part of this shift translates into, or is experienced as, the perceived

opportunities to expand provision beyond more 'traditional' face-to-face delivery and on into

the digital space. Thereby the pressure to expand into online is not necessarily from the

institution, but from a wider combination of technological evolution, evolving market forces,

shifting national and international economies and rapidly fluctuating demographics. HEIs,

then, are both caught up in these changes, as well as expected to be at the forefront of it.

There is a quite tangible and increasing pressure for educational institutions to expand

distance learning provision (Hunt, et al., 2014), and yet 'the lack of acceptance of online

among faculty has not shown any significant change in over a decade' (Allen & Seaman,

2015, p. 21). As there is a 'positive correlation between faculty satisfaction and student

performance' (Bolliger & Wasilik, 2009, p. 106), we need to have better training and support

mechanisms in place if such initiatives are to succeed. We either need a better understanding

of the motivations and perspectives of academic staff (faculty), or we need a better way to

address them. With an eye to such a task, this review of the literature will outline some of the

possible ways of reading the general impact of a shift to distance learning on its key

stakeholders, whilst also being aware that each particular instance of such a transition must

also be addressed on the particular terms of that project.

The promise of increased flexibility and expanded reach achieved through

transitioning to distance learning does allow institutions and academics great opportunities for applying new pedagogical techniques and providing innovative instruction (Hunt, et al., 2014). The extended reach of providing education at a distance also allows access to new student populations (Baukal, 2010). This expanded pool of potential students include those who cannot take time away from work, and those who are tied to a particular geographic location beyond that of the host institution (Kosak, et al., 2004). This ability to reach a wider audience results in greater diversification and a spreading of institutional risk around enrolled student numbers (Maguire, 2005). It is no surprise, then, that universities see distance learning as a 'major revenue and recruitment tool' (Legon & Garrett, 2018; Valentine, 2002; Kosak, et al., 2004, p. 1).

Yet the purported financial benefits of a shift to distance learning are less clear. Eighty percent of larger institutions view distance programs as revenue generators (Legon & Garrett, 2018), but the same study also reported 'near unanimity among 197 administrators that the financial cost of delivering distance programs is substantially greater than the cost of campus-based programs' (p.20). Furthermore, only 40% of institutions with smaller distance education offerings reported that distance programmes were a net generator of revenue. It is unclear, therefore, whether distance learning reduces the time and effort of academics compared to on-campus courses, or that any additional workload requirements are balanced by increased revenue. Although the option for students to submit work electronically reduces administrative burden (Heinrich, Milne, & Moore, 2009), and although a commitment to build an online repository of content should eventually result in the freeing up of academic time (Islam, Beer, & Slack, 2015), the studies that measure or ask academics about their workload with distance learning compared to an on-campus course find that there is remains a higher workload associated with distance courses (Bolliger & Wasilik, 2009; Islam, Beer, & Slack, 2015).

Possible frameworks for reading the transition to distance learning

One formula for assessing the transition to online learning is the relationship between costs and benefits, although the specifics of this will, of course, differ for each key stakeholder (students, teaching staff, support staff, the hiring industry, and the higher educational institution itself) (Wagner, Hassanein, & Head, 2008). It is, however, difficult to measure the cost of something like an adverse impact on the perceived brand of the institution, something which an unsuccessful transition to distance learning can provoke. Furthermore, as detailed and accurate market research is difficult to obtain in terms of the defined markets for online learning, particularly in the PGT and post-experience sector, we often approve a move to distance learning as if it were a sure-fire revenue generator, whilst only realising the limitations and difficulties of that jump after we are committed to the change. In this sense, any initial proposed cost/benefit ratio often becomes unbalanced as the transition process evolves.

As noted by Diana Laurillard, "*costing studies for new technologies have given little help to innovators and managers because they have tried to give a definitive and generalized answer to the question of whether they are cost-effective*" (Laurillard, 2007). Yet Laurillard also emphasises that "*given the cost of new technology, the value we expect from it, and the extensive planning it requires, it is essential that innovators should be able to get a better grip on the relationship between the expected benefits and the likely costs.*" (Laurillard, 2007). She proposes, then, a reorientation of the analysis towards a 'benefit-oriented cost model', one which would take in "*the relation between the critical benefits (learning experiences) and the critical costs (time)*" (Laurillard, 2007). Again, although this is difficult to generalise across institutions, she points to seven characteristics that should be taken into account in any such modelling exercise. It should:

1. "*Define benefit parameters that can differentiate between old and new methods*

2. *Define the cost parameters that can be associated with comparative benefits*

3. *Focus on the major cost driver of staff time*

4. *Represent value to the learner in terms of use of their time*

5. *Support the local exploration of the cost-benefit relationship*

6. *Represent technology-specific benefits*

7. *Represent benefits in terms of improvements in learning"* (Laurillard, 2007).

Although there has been much work done on cost-benefit analyses in online learning (see, for example Legon & Garrett, 2018 and Rumble, 2012), we find Laurillard's argument that the *"costing models in the literature have had almost no impact on practice in educational institutions planning e-learning innovation"* (Laurillard, 2007), persuasive. They do not achieve consistency, they do not fit local practice, and they require considerable effort on the part of users and innovators to work out costs typically unavailable to them, given the recondite nature of teaching costs. This is particularly apposite as the techniques, technologies, partnership opportunities, competitors, demographics and delivery models involved in distance learning initiatives are evolving at an increasingly rapid pace.

As we have already discussed, the perceived advantages and disadvantages of distance learning are varied. Indeed, in Betts & Heaston (2014) – a survey which meaasured the perspectives of academic staff and deans against a list of 29 motivating and 20 inhibiting factors – we find that faculty with distance education experience rate the main motivating factors very differently to those without the experience. A key, but unsurprising, finding from this research is that those with experience of distance education said the key driver was personal motivation; suggesting that evidence for the benefits associated with online delivery are lost in translation between the actual experience of delivery and the sharing of the practice in the wider learning communities of the institution. Other motivators were, as with university administrators, related to benefits around flexibility and increased reach. University Deans and those who have not participated in distance learning, however, said that financial compensation or released time

would be the main motivation factors. This suggests that senior academic faculty with extensive experience are seeing greater economic benefit associated with online learning, but that the positive pedagogical aspects of teaching online are being lost amongst that particular rhetoric. As those who are excited by distance learning are more than likely teaching that way already, those who need encouragement to teach via distance learning may need a different set of strategies to motivate them, one that communicates both economic and professional, practice-centred benefits.

The main inhibitors were more similar between the three groups, with these fitting into three main areas: quality, time and support. Despite the comparable outcomes for students participating in distance learning programmes, concerns over the quality of the courses was one of the top inhibiting factors for both faculty groups. Although there is a large body of work comparing educational outcomes of distance learning to on-campus courses (WICHE Cooperative for Educational Technologies, 2010), this remains a valid concern. While the issue is by no means settled, there is substantial evidence that distance learning can deliver the same, if not better, educational outcomes (Means, Toyama, Murphy, Bakia, & Jones, 2009). What remains, however, is to ascertain the specific circumstances that result in equal or better educational outcomes for distance learning, rather than whether or not it is possible.

Although there may be no significant difference between the education outcomes of distance and face-to-face teaching on average, transitioning from one to the other involves a lot more than recording the lectures and putting them online. Educators need to change their teaching practices, and sometimes in quite profound ways, to benefit from the new medium (Kosak, et al., 2004). To change the way in which you teach is a significant undertaking. We cannot expect academics to be able to produce the same quality of educational experience unless they have – together with sufficient motivation – either the training or support to cope with this new format. This relates to the second and third areas in which inhibitors are grouped:

time and support. As previously stated, distance education can require significantly more time, especially in the preparation of material (Siemens, Gašević, & Dawson, 2015) despite the fact that '63% of distance learning faculty is compensated for a distance learning course as if it were a normal course' (Kosak, et al., 2004, p. 3). This might go some way to explaining why academics list time as one of the main inhibiting factors of transitioning to distance education. A different perspective on the issue is given by Hunt et al. (2014, p. 5), who grouped concerns about teaching distance learning into four categories: technology, student, pedagogy, and institution:

- 'Technology-related concerns included measures of the lack of technological skills of themselves and students, the lack of availability of technology, the lack of technical support/training, and the lack of training, in general.

- Student-related concerns included measures of the lack of student interaction with faculty and other students, the inability to be responsive to students, and students with disabilities.

- Pedagogy-related concerns included the lack of flexibility, the lack of adaptability to making quick changes to the course, the lack of time to prepare and monitor the course, work overload, questionable course quality, and not meeting learning outcomes.

- Institution-related concerns included intellectual property ownership, and lack of institutional support/commitment.'

When read in combination these latter two frameworks for reading the impact of a transition to distance learning are particularly useful. The series: time, quality and support, interweave with that of four areas of focus outlined above by Hunt et al.,(2014) to produce a matrix for reading the inhibitors to a transitioning to distance learning. Time, quality and support impact all facets of the move to distance learning, although our research suggests that the 'student' category

must be extended to something along the lines of 'people' to also include both professional and academic university staff.

Methods

This study was carried out during 2017 within the Faculty of Science and Engineering at The University of Manchester – a large research intensive UK Higher Education Institution. It examines, in real-time, staff attitudes towards transitioning two successful campus-based taught MSc programmes to a fully location-independent distance learning delivery model. The two programmes selected for the study were the MSc in Project Management programme in the School of Mechanical, Aerospace and Civil Engineering and the MSc in Electrical Power Systems Engineering in the School of Electrical and Electronic Engineering. These programmes sit in two different engineering departments within the Faculty. The programmes were selected for this study as they were beginning their move to a Distance Learning model as of early 2017, and the academic teaching staff and instructional designers were all in post. The project was funded internally, jointly by both departments, and ethical approval for the project was received from the School of Mechanical, Aerospace and Civil Engineering.

The study adopted a qualitative research design, comprising fifteen semi-structured face-to-face interviews with each of the engineering academics and instructional designers tasked with organising, designing and delivering this transition to distance learning on the two programmes. A qualitative research design, with interviews, was chosen as a more appropriate way of mining the richness of attitudes of staff towards distance learning as opposed to surveying it as in a quantitative research design (McCracken, 1988). Qualitative interviews can also act as a corrective response to a scientific method based approach and as argued by Gergen (2001), enable a better understanding of the human experience.

The participants were purposively selected to include the two Programme Directors, all module leaders, and the three instructional designers (allocated full-time to support the conversion of both content and delivery from campus-based to fully location independent Distance learning). The academics ranged in age from 25 to over 55 years old. All were permanent academic staff: one Professor, one Reader, five Senior Lecturers and five Lecturers. Eleven of the twelve academics had no prior distance learning experience, although several had previously been involved in the delivery of a blended professional development programme. Two of the instructional designers had a number of years distance learning experience, whilst the third had no prior distance learning experience. The instructional designers ranged in age between 25 and 54.

All the interviews were carried out between March and December 2017, using an independent facilitator, who followed a pre-agreed interview protocol (See Appendix 1). The interviews were scheduled at the same time as academic staff and instructional designers were developing their module pedagogy, content and format. The first interview questions gathered basic demographic data such as role, age and prior distance learning experience. The second part of the interviews was more open-ended and comprised seven further questions, around which the conversation was allowed to flow freely. These seven questions covered areas such as the impact of the transition to distance learning on participants, what participants were looking forward to about it and what they were worried about, and what they saw as the benefits and challenges of distance learning to them. The interview questions were chosen to directly address the research question 'What are staff attitudes and perceptions towards the transitioning of two existing MSc programmes from a successful campus based model to a new distance learning model?' We selected interview questions that would have meaning for the participants; question prompts that they could engage with (Turner 2010) and ones that would elicit open ended responses (Gall, Gall and Borg 2003).

The use of a small number of standardised, yet open ended, interview questions allowed participants to share as much detailed information they wished, enabling them to fully express their opinions and experiences and facilitating the collection of rich qualitative data in response to our primary research question (Cresswell, 2007). The interview questions were agreed between the two lead researchers and piloted on the independent facilitator (another engineering academic, but not involved in these two distance learning programmes).

All interviews were audio recorded and each lasted up to an hour. The interviews were then anonymised and transcribed. Analysis of the qualitative interviews followed the process of long interview analysis (McCracken, 1988). This process begins with a textual analysis of each interview transcript; and then relating observations made by participants to develop themes. The transcripts are then set aside and observations and relations between the observations are developed into themes and patterns, whilst simultaneously drawing on the extant literature on distance learning to make sense of the findings. At this stage, each emerging theme, pattern or interrelationship may either confirm, change or challenge the literature. Finally, the emerging themes from all the interviews are used to create theses, findings and conclusions, which form the results of the study. Both authors undertook the process of data analysis in an iterative and discursive process, to minimise any potential for individual bias in interpreting the data collected.

Results

The findings of this study present a rich picture of the real-time impact on individual academics and instructional designers of transitioning two distinct on-campus programmes to a distance learning model. These findings are organised around

the impact of distance learning on the study participants, and their perceptions of its challenges and benefits.

Impact on staff of adapting on-campus to distance learning model

Both academic and instructional design participants were of the view that the transition to distance learning would have a significant impact on them. The following quote from a module tutor is indicative of several participants:

> 'The impact will be significant – in terms of time to ensure the students are following the material, responding to student feedback and more time responding to emails. Big learning curve to make sure that quality is not compromised'

Two key themes around impact of distance learning on staff emerged in the interviews: firstly, the *new pedagogical approaches* that distance learning required and, secondly, anxiety about the *additional workload* that developing and delivering distance learning programmes would entail.

New pedagogical approaches

The requirement to adopt new approaches to teaching distance learning and new ways of engaging students to compensate for the loss of face-to-face interaction was viewed as a major impact of the transition to distance learning. To quote the Programme Director of one programme

> 'Face to face contact will be lost in distance learning so requires front end thinking about how students will engage with the material'

Other participants described the need to design new feedback mechanisms and the importance of scaffolding material so that "students don't get lost in the course". One module tutor was particularly worried about how they would be able to initiate and facilitate complex discussions at a distant, asynchronous environment, stating

'I like to share complex situations through interaction, open and visual communication. And I can't see how to do that with distance learning'

This perceived loss of student interaction, was accompanied by an acknowledgement that distance learning demands a change in role for academics, away from direct contact to students and towards being 'a curator of knowledge and sign-poster of support' as stated by another academic. Participants exhibited a sense of nervousness about distance learning in general; a fear of the unknown, the technology and a level of resistance to change, which Maguire (2005) classes as one of the key intrinsic inhibitors to staff engagement with distance learning. That said, most academic participants were open to the potential of distance learning, viewing it as a learning opportunity rather than an insurmountable challenge. For example, producing new content and materials for distance learners would enable the lecturer to reuse these materials in on-campus teaching.

'Distance learning has allowed me to take risks in assessment, for example getting students to record a video as the exam. So I've been able to broaden the assessment and this has the potential to be rolled over to the existing programme'

The final pedagogical impact of transitioning programmes to distance learning was the challenge of maintaining quality; in terms of teaching, assessment rigour and institutional reputation, as evidenced by the following quotation from a module tutor;

'if we cannot convince the market that you are providing the same quality of education as if people are physically in the room with you, and that assessment, system and processes, and examination system and processes are robust, it is easy to lose credibility'

This linking of time to quality leads into the second major impact of distance learning – that of the additional workload it entails.

Additional workload

The academic participants were most strongly concerned with the impact on their time in terms of material preparation. As two respondents, one from each programme stated:

> 'the biggest impact is the one off preparation time. I have had to book out a fair amount of time this semester to develop materials, looking at what we have got, what to add in, in what format – working with the eLearning technologist'

> 'it's a lot more work; I've had no summer holiday this year because of distance learning'

Over the longer term, academic participants were also concerned about the amount of time that would be required to support and assess distance learners, as articulated by one academic here:

> 'delivering the module is not actually the issue – the issue is student assessment, support and feedback'

Module tutors and programme directors alike were uncertain about the time required to produce distance learning materials and to adequately support students; an issue that exacerbated the sense of chronic managerial workload that academics are under, and which underpinned many of the worries that academics had about distance learning. Concerns were expressed about the potential requirement to extend the working day to support learners located in different time zones around the globe. There was also uncertainty around the numbers of students that would be recruited to the new distance learning programmes as evidenced here:

> 'I am the module tutor and the amount of additional workload will depend on the number of students'

The impact of workload was less pronounced on the instructional designers, who all had 100% workload allocated to the programmes and therefore fewer competing pressures on their time. All three instructional designers interviewed were excited about the challenge of distance learning and the opportunity to work at the leading edge of the institution. The

instructional designers' concerns were more about how to allay academics' fears about the demands of distance learning and how to engage academics best through the process of material development.

Staff perceptions of the challenges and benefits of distance learning on pedagogy, technology, students and the institution.

Table 1 shows the benefits and Table 2 the challenges of distance learning as articulated by the participants in this study. The tables are structured around the key themes identified in the literature: *pedagogy, technology, students* and the *institution* and so link directly back to the literature review. As stated earlier, the ability to engage with new *pedagogies* (such as flipped learning and video) and to roll-back newly prepared and more up-to-date teaching materials into existing face-to-face teaching was seen as a major benefit of transitioning a programme to a distance learning format. The time pressure facing academics, however, pervaded all aspects of the transition; from having the time to produce high quality materials, to being able to adequately support and rigorously assess distance-learning students. There was also uncertainty over precisely how much material to prepare, the timing and format of assessments (when traditional exams are no longer an option), and how to replicate practical laboratory classes within the constraints of distance learning. Indeed, a few participants were still grappling with trying to understand what distance learning is and how to teach it effectively. Academic participants thought that pre-prepared distance learning materials would be conservative and less cutting-edge, leaving less space to practice research-led teaching and engage with topical and relevant media stories.

In terms of *technology*, the participants – both academic and instructional designers – acknowledged the opportunity that distance learning provided to engage with and master new technology. In doing so academics could future proof their teaching to some extent and as an

added benefit introduce many of these technologies across their campus based teaching too. Few fears were expressed about the technology required for distance learning, perhaps reflecting the growing ubiquity of technology in Higher Education. Participants just needed the reassurance that they were not alone; that instructional designers and institutional IT support stood alongside them in their distance learning journey.

Participants in this study raised a number of benefits and challenges to the *institution* of pursuing a distance learning strategy. For example, there was an appreciation amongst both academic and instructional design staff that distance learning offered the potential to increase the global reach of the institution, to enhance its reputation and develop new sources of income from distance learning programmes. This was articulated by one module tutor as follows:

> 'I am more and more convinced that distance learning is something that we have to do. The world of Higher Education is changing and I don't think we can sustainably stick to traditional ways of teaching.'

Another tutor stated that:

> 'For [Institution Name] it helps strengthen our reputation. A world-leading course now has a distance learning option. Helps future proof us against full-time course, which is highly dependent on one country. So distance learning is good diversification strategy'

In terms of institutional challenges, participants were concerned about securing long-term institutional support for distance learning in terms of academic workload, support tutors and the recruitment of new staff. As articulated by one module leader

> 'balancing workload is essential – if that can be done then I will look forward to distance learning.'

Related to this were concerns over how clearly articulated the institution's distance learning strategic priority was and how much marketing was being done to attract students. Finally there were real concerns as to whether transitioning to distance learning would 'cannibalise

existing programmes' or lead to a loss of institutional reputation if assessment standards could not be maintained over a large cohort of widely distributed learners.

Lastly, participants were enthusiastic about the opportunities afforded to *students* through distance learning; firstly in terms of allowing access to a wider diversity of students from different cultures and backgrounds and secondly, by providing increased flexibility for students to study courses from their host country or location or whilst in employment. Instructional designer participants were particularly clear about the benefits of distance learning in and of itself, for example as providing the opportunity for students to learn flexibly, and to learn anywhere. As stated by one respondent

'distance learning supports life-long learning, supports peoples' careers',

and another:

'distance learning is a very democratic thing – our ultimate goal is same course, same quality just different mode of delivery'.

At the same time staff were mindful of the challenge to maintain a quality student experience for distance learners, to mitigate any sense of feelings of isolation felt by students and to minimise any negative impacts on the initial cohorts of distance learning as academics developed their distance learning experience.

Pedagogical		Technological		Institutional		Student	
Study Findings	**Prior Literature**	**Study Findings**	**Prior Literature**	**Study Findings**	**Prior Literature**	**Study Findings**	**Prior Literature**
Opportunity to engage with new pedagogical approaches (flipped, video etc.)	(Hunt, et al., 2014)	Opportunity to learn and use new technology	(Maguire, 2005)	Strengthens institution's reputation		More diverse student body	(Baukal, 2010)
New distance learning materials can be re-used in on-campus teaching		Future-proofs courses against technological change		New income streams, which are more internationally diversified	(Hunt, et al., 2014; Maguire, 2005; Legon & Garrett, 2018)	More flexible learning -in time and place that suits students' lifestyle/ employment pattern	(Hunt, et al., 2014)
Development of more global teaching (e.g case studies etc.)		Distance learning materials are all re-usable		New source of students	(Baukal, 2010)	Students able to learn with others from different cultures/regions of the world	
Provision of flexible learning – time and location independent	(Hunt, et al., 2014; Sahin & Shelley, 2008)	Distance learning is online ,asynchronous, and scalable	(Sahin & Shelley, 2008)				
Opportunity to work closely with instructional designers							

Table 1: The perceived benefits of transitioning to distance learning

Pedagogical		Technological		Institutional		Student	
Study Findings	**Prior Literature**	**Study Findings**	**Prior Literature**	**Study Findings**	**Prior Literature**	**Study Findings**	**Prior Literature**
Maintaining quality of courses	(Means, Toyama, Murphy, Bakia, & Jones, 2009; Betts & Heaston, 2014)	Staff require support to learn and adopt new learning technology	(Hunt, et al., 2014; Minnaar, 2013)	Provision of sufficient levels of support (instructional designers, school support, additional tutors etc)	(Betts & Heaston, 2014; Minnaar, 2013)	Ensuring good engagement, and interaction and avoiding isolation	(Hunt, et al., 2014; Maguire, 2005)
Challenges in replicating on-campus student experience and levels of engagement	(Betts & Heaston, 2014)	Requirement for 24 hour helpline for IT/technology support		Will new courses be ready on time - academics have limited bandwidth amidst other competing pressures of research, campus teaching etc.	(Bolliger & Wasilik, 2009; Islam, Beer, & Slack, 2015)	Uncertainty over size of distance learning courses – too big or too small – both impact on student experience	
Designing effective assessments	(Kosak, et al., 2004)	Ensuring teaching materials (eg videos) are of high quality		Distance learning needs to be articulated as institutional priority	(Minnaar, 2013)	Risk of student's getting behind/lost on the course	(Hunt, et al., 2014)
Effectiveness of online tutorials vs face-to-face	(Hunt, et al., 2014)			Distance Learning courses require additional marketing		Early cohorts will be guinea pigs for distance learning materials and programme design	
Being allowed sufficient time for experimentation in material development	(Bolliger & Wasilik, 2009; Islam, Beer, & Slack, 2015)			Risk of distance learning cannibalising existing campus programmes			
Less flexibility/margin for error, e.g. explanations in video must be 100% correct	(Hunt, et al., 2014)						

Table 2: The perceived challenges of transitioning to distance learning

Discussion

Overall, all the instructional designer participants and all but two of the academic participants were positive towards transitioning to distance learning. This finding stands in contrast to earlier work by Maguire (2005) and Kinney, Liu and Thornton (2012). In our study, most participants, despite being nervous about the additional time commitments required for distance learning, remained positive about the learning and development opportunities offered by the move to distance learning. This sentiment was captured eloquently by one module tutor, who was just beginning their distance learning journey:

> 'overall I think transitioning to distance learning is positive, buts it's the getting there, the journey to it, that is possibly the difficulty but I think it's a good journey to make'

Another stated that

> 'I am positive generally. It is a good journey to take, but I am sure there will be cul-de-sacs along the way'

Participants were also strongly motivated by the ability to reuse new distance learning content such as videos within their face-to-face teaching as indicated by the following module tutor comments:

> 'so new distance learning content is reusable and can improve existing courses'

and

> 'the thing I am interested in is using new technologies around flipped teaching and using video to discuss core concepts in my module'

Overall, distance learning transition was seen to give permission and impetus to the academics' latent wishes to engage with more innovative pedagogies such as flipped learning, and to redesign slightly dated face-face material and was a major motivating factor for the academics in this study.

Staff also grasped the benefits of distance learning to the institution (in terms of increasing reach, reputation and income) and to students (in terms of flexibility, and widening access to courses). These results are broadly consistent with earlier findings (Betts & Heaston, 2014; Maguire, 2005; Siemens, Gašević, & Dawson, 2015). Staff perceptions of distance learning in this study were influenced by both motivators (such as personal development and as an opportunity to reinvigorate teaching materials and methods) and inhibitors (such as fear of change, lack of experience of what distance learning entails, and pressures on an already busy academic workload).

Time – to prepare resources and to support students – was the most pressing concern for the participants in this study. For the majority of academics in research intensive institutions, the pressure to produce research outputs, bring in grant income and to deliver an excellent student experience for campus based students all sit higher up the priority list than the need to convert existing courses to a distance learning format. The second concern expressed by academics was the requirement to learn and implement new pedagogical approaches in order to prepare and lead distance learning modules. Again, this finding is consistent with work with previous work by Kosak et al. (2004). However, the real-time interviewing of study participants provided a number of further subtle but important insights into the opportunities afforded by transitioning to distance learning that have not previously been reported in the literature. First, the ability of staff to learn from a global student cohort, enabling a richer set of teaching materials, anecdotes, and case-studies to be developed. In today's context, the notion of students and staff as co-producers of knowledge is an important one (JISC, 2019) and distance learning cohorts provide a rich and new source of knowledge for academics located physically in one region.

The second insight is that academics were able to turn their concerns into a positive,

by grasping the opportunity of re-using newly created distance learning content in existing on-campus teaching. This is a somewhat counterintuitive finding – that engaging with distance learning, although time consuming would actually improve one's campus based teaching. And finally, the fact that the quality of distance learning materials actually needs to be higher than campus based materials. Pre-recorded videos, written case studies and discussion board responses, provide a permanent record of knowledge so need to be 100% accurate and of the highest quality. There is no room for a fudged explanation as might be occur in a live lecture situation. Consistent with the literature (Hunt, et al., 2014; Maguire, 2005; Legon & Garrett, 2018) the majority of participants in this study appreciated the institutional opportunities afforded by distance learning in terms of enhancing global reach, opening up access to study to previously underserved groups and as a new source of income for the institution. This view was shared across both programmes and across both academic and instructional design staff.

Given the growing importance of institutional demands to embrace distance learning, what are the implications of this study for institutions that are moving into the distance learning space, and for staff who are asked to lead on and implement distance learning initiatives? To answer this question, we have drawn on the literature and our study findings to proffer a set of recommendations in Table 3 for both academics and their employing institutions. These recommendations are structured around the two recurring themes identified in this study; that of pedagogy and time.

Responsibility	Pedagogy	Time
Staff	View involvement in distance learning as an opportunity to update, redesign and perhaps revolutionise on-campus courses and pedagogical approaches. (Hunt, et al., 2014) *Reuse distance learning materials in campus based teaching* *Draw on experience of globally diverse distance learning students to co-create new knowledge and learning materials* *Collaborate with colleagues and instructional designers to allow appropriate pedagogical approaches for distance learning to evolve. Don't work alone.*	Fight for sufficient time to prepare and teach distance learning; it should not be a weekends/holiday task
Institution	Provide dedicated instructional design support to distance learning programmes allowing good practice to be shared across whole programmes. (Bolliger & Wasilik, 2009; Islam, Beer, & Slack, 2015) Make it easy for academic staff to 'do' distance learning by using standardised course structures, a common nomenclature and robust and user-friendly technology. (Minnaar, 2013; Maguire, 2005) Identify academics that are enthusiasts about developing and improving their teaching practice and harness that enthusiasm and expertise towards distance learning (Saunders F. , 2017) Provide opportunities and events for staff to share good practice (Saunders F. , 2017)	Acknowledge and reward involvement in distance learning (via workload allocation, promotion committees etc.) (Betts & Heaston, 2014; Minnaar, 2013) Allow time for instructional designers to sit alongside academics as they develop module content (Bolliger & Wasilik, 2009; Islam, Beer, & Slack, 2015)

Table 3: Recommendations for academics and institutions involved in distance learning Note: recommendations in italics were novel to this study, the remaining recommendations have been previously reported in the literature

Conclusions

      This study makes two important contributions to theory and practice. Firstly, the findings provide a rich picture of the opportunities and challenges that distance learning presents to both academic and instructional design staff, and their views of the impact of distance learning on *pedagogy*, on *technology*, on their *institution*, on *students* and on *themselves*. In doing so, we make an important contribution to the literature on engineering education, which will benefit HE institutions around the globe who are also grappling with the opportunities and challenges of distance learning. The real-time experiences of the participants in this study exemplify the impact of distance learning on both the pedagogical approaches adopted by academics and its not-insignificant impact on their already chronic workload. The participants in this study viewed distance learning as providing opportunities for staff to adopt new pedagogies and learn new technologies; folding back new content into existing programmes and simultaneously transforming existing programmes and units into a more flipped style of learning. Staff also grasped the benefits of distance learning to the institution (in terms of increasing reach, reputation and income) and to students (in terms of flexibility, and widening access to courses)

      Secondly, we synthesise the prior literature and the findings of the study to proffer a number of recommendations for both academics and Higher Education Institutions to consider when moving into the distance learning space. Interrogating staff attitudes to distance learning in this way and providing insights into the support that staff need to be able to develop and deliver high quality and effective distance learning programmes should enhance the chances of, and minimise the barriers to, a successful roll-out of distance learning.

Limitations and areas for future research

There are a number of limitations in this study that lead to future opportunities for research. The data collected was qualitative in nature, and although we interviewed all academics and instructional designers involved across the two programmes, we did not triangulate the data with more quantitative data such as timesheets for time spent on distance learning versus campus-based teaching. Performing a systematic comparison of the time spent preparing, teaching, supporting and assessing a campus-based vs a distance learning unit would provide additional evidence as to the time commitment required for distance learning. Secondly, the data collected in this study provides only a snap-shot of staff attitudes, based on one off face-to-face interviews. A follow up study, which interviews the same staff members after they have transitioned their units to distance learning would provide further insights into how staff attitudes to distance learning change over time and as their experience with the format increases. Lastly, this study was situated in a single research intensive HEI in the United Kingdom. Replicating the study across other institutions, both in the UK and internationally, would most likely provide further insights into academic and instructional design staff perceptions towards distance learning.

References

Allen, E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States.* Newburyport: Sloan Consortium.

Allen, E., & Seaman, J. (2015). *Grade Level: Tracking Online Education in the United States.* Babson Park, MA: Babson Survey Research Group.

Baukal, C. E. (2010). Continuing engineering education through distance learning. *European Journal of Engineering Education, 35*, 225-233.

Betts, K., & Heaston, A. (2014). Build it but will they teach?: Strategies for increasing faculty participation & retention in online & blended education. *Online Journal of Distance Learning Administration, 17*, n2.

Bolliger, D. U., & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education, 30*, 103-116.

Bonwell, C. C., & Eison, J. A. (1991). *Active Learning: Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports.* Washington: ERIC.

Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2012). Interactive learning online at public universities: Evidence from randomized trials. *Ithaka S+ R, 22*.

Bozkurt, A., Akgun-Ozbek, E., Yilmazel, S., Erdogdu, E., Ucar, H., Guler, E., . . . others. (2015). Trends in distance education research: A content analysis of journals 2009-2013. *The International Review of Research in Open and Distributed Learning, 16*.

Brewer, R., & Movahedazarhouligh, S. (2018). Successful stories and conflicts: A literature review on the effectiveness of flipped learning in higher education. *Journal of Computer Assisted Learning, 34*, 409-416.

Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Ferrer-Torregrosa, J., Jiménez-Rodríguez, M. Á., Torralba-Estelles, J., Garzón-Farinós, F., Pérez-Bermejo, M., & Fernández-Ehrling, N. (2016). Distance learning ECTS and flipped classroom in the anatomy learning: comparative study of the use of augmented reality, video and notes. *BMC medical education, 16*, 230.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.). Boston, MA: A & B Publications.

Gergen, M. (2001).*Feminist reconstructions in psychology: Narrative, gender, and performance*. Thousand Oaks, CA: Sage.

Gillie, M., Dahli, R., Saunders, F. C., & Gibson, A. (2017). Use of rich-media resources by engineering undergraduates. *European Journal of Engineering Education, 42*, 1496-1511.

Heinrich, E., Milne, J. D., & Moore, M. (2009). An Investigation into E-Tool Use for Formative Assignment Assessment-Status and Recommendations. *Educational Technology & Society, 12*, 176-192.

Hunt, H. D., Davies, K., Richardson, D., Hammock, G., Akins, M., & Russ, L. (2014). It is (more) about the students: Faculty motivations and concerns regarding teaching online. *Online Journal of Distance Learning Administration, 17*, 62-71.

Isaias, P., Reis, F., Coutinho, C., & Lencastre, J. A. (2017). Empathic technologies for distance/mobile learning: An empirical research based on the unified theory of acceptance and use of technology (UTAUT). *Interactive Technology and Smart Education, 14*, 159-180.

Islam, N., Beer, M., & Slack, F. (2015). E-learning challenges faced by academics in higher education. *Journal of Education and Training Studies, 3*, 102-112.

JISC. (2019). *Turning students from consumers into creators*. Retrieved from https://www.jisc.ac.uk/news/turning-students-from-consumers-to-creators-28-feb-2019

Kinney, L., Liu, M., & Thornton, M. A. (2012). Faculty and student perceptions of online learning in engineering education. *ASEE Annual Conference and Exposition, Conference Proceedings*.

Kosak, L., Manning, D., Dobson, E., Rogerson, L., Cotnam, S., Colaric, S., & McFadden, C. (2004). Prepared to teach online? Perspectives of faculty in the University of North Carolina system. *Online Journal of Distance Learning Administration, 7*, 1-13.

Laurillard, D, (2007). Modelling benefits-oriented costs for technology enhanced learning. *Higher Education*, Vol. 54, 1, 21-39.

Legon, R., & Garrett, R. (2018). The changing landscape of online education (CHLOE) 2: A deeper dive. *Quality Matters & Eduventures Survey of Chief Online Officers*. Retrieved from https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/CHLOE-2-report-2018

Levy, S. (2003). Six Factors to Consider when Planning Online Distance Learning Programs in Higher Education. *Journal of Distance learning Administration, VI*, 1-19.

Maguire, L. L. (2005). Literature review--faculty participation in online distance education: Barriers and motivators. *Online journal of distance learning administration, 8*, 1-16.

Mansbach, J., & Austin, A. E. (2018). Nuanced Perspectives about Online Teaching: Mid-Career and Senior Faculty Voices Reflecting on Academic Work in the Digital Age. *Innovative Higher Education*, 257-272.

McCracken, G. (1988). *The long interview* (Vol. 13). Thousand Oaks: Sage.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.* Washington: U.S. Department of Education, Office of Planning, Evaluation, and Policy Development.

Minnaar, A. (2013). Challenges for successful planning of open and distance learning (ODL): A template analysis. *The International Review of Research in Open and Distributed Learning, 14*, 81-108.

Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education, 14*, 129-135.

Rumble, G. (2012). *The costs and economics of open and distance learning.* Abingdon-on-Thames: Routledge.

Sahin, I., & Shelley, M. C. (2008). Considering students' perceptions: The distance education student satisfaction model. *Educational Technology & Society, 11*, 216.

Saunders, F. (2017). *Distance learning in a Research Intensive University: A Coalition of the Willing*. Retrieved from http://fionasaunders.co.uk/moving-to-distance-learning-in-a-russell-group-institution-a-coalition-of-the-willing/

Saunders, F. C., & Gale, A. W. (2012). Digital or didactic: Using learning technology to confront the challenge of large cohort teaching. *British Journal of Educational Technology, 43*, 847-858.

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational researcher, 27*, 4-13.

Siemens, G., Gašević, D., & Dawson, S. (2015). *Preparing for the digital university: A review of the history and current state of distance, blended, and online learning.* Athabasca: Athabasca University. doi:10.13140/RG.2.1.3515.8483

Simonson, M. (2016). *Distance Education: Statewide, Institutional, and International Applications of Distance Education.* Charlotte: IAP.

Turner, D. W., III (2010). Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*, 15(3), 754-760. Retrieved from http://www.nova.edu/ssss/QR/QR15-3/qid.pdf

Tynan, B., Ryan, Y., & Lamont-Mills, A. (2015). Examining workload models in online and blended teaching. *British Journal of Educational Technology, 46*, 5-15.

Valentine, D. (2002). Distance learning: Promises, problems, and possibilities. *Online Journal of Distance Learning Administration, 5*, 1-11.

Wagner, N., Hassanein, K., & Head, M. (2008). Who is responsible for e-learning success in higher education? A stakeholders' analysis. *Journal of Educational Technology & Society, 11*, 26-36.

Watkins, R., & Kaufman, R. (2003). Strategic planning for distance education. *Handbook of distance education*, 507-517.

WICHE Cooperative for Educational Technologies. (2010). *No Significant Difference*. Retrieved from http://www.nosignificantdifference.org/

Wingo, N. P., Ivankova, N. V., & Moss, J. A. (2017). Faculty perceptions about teaching online: Exploring the literature using the technology acceptance model as an organizing framework. *Online Learning Journal*, 15-35.

Appendix 1 – Interview Protocol

RESPONDENT NAME _____

PROGRAMME _____

DATE _____

INTERVIEWER _____

Demographic Data

1. Age Band 25-34☐ 35-44☐ 45-55☐ Over 55☐

2. Role in distance learning project (E.g. Module Tutor, Instructional Designer, Programme Director, Administrator)

3. Prior experience of distance learning Education – Please describe this briefly

4. When does your unit start to run as distance learning, and what preparation have you already done?

Indicative Discussion Questions

5. How do you think the transition to distance learning on the programme will impact you?

6.   What are you looking forward to about participating in the distance learning programme

7.   What do you see as the benefits of the transition to distance learning?

8.   What challenges do you foresee in distance learning?

9.   What are you worried about?

10. Is your overall feeling towards the transition to distance learning positive or negative

11. Can you explain why you feel this way?