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Discussion Paper

The effects of the COVID-19 lockdown on teaching and engagement in UK business schools

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Abstract
The global outbreak of COVID-19 mandated a rapid shift to online teaching and assessment. We use quantitative and qualitative research to examine how prior online experience, learning during the lockdown, and work engagement impacted upon academics' views of teaching delivery and assessment during the lockdown. Representative quantitative data from 2,287 business, management and economics academics in the UK shows that: 1. experience of online activity *prior* to the lockdown is positively related to perceptions of working virtually, though perceptions differed by seniority; 2. experience of online activity *during* the lockdown does not impact academic's views of online delivery, but increases positive attitudes to online marking; 3. those able to maintain mental resilience and energy are considerably more likely to perceive online activity positively. Perceived job insecurity affects how academics assess online activity. Academics agree that the amount of work involved in preparing for an online environment is greater than required for face-to-face delivery. Qualitative data shows the impact of the social and individual context of the respondents on wellbeing, job security, engagement and aspirations towards online teaching and learning.

Keywords
Higher education, global lockdown, online teaching and assessment, work engagement, job insecurity

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Introduction

One effect of the 2020 COVID-19 lockdown was a rapid shift of work from the 'work office' to the 'home office'. The shift has brought into a sharp focus the extent to which work activity can be conducted virtually. Online work has been widely available for decades, but despite its purported advantages, it has not been diffused as much as some scholars had suggested (de Menezes & Kelliher, 2011; Felstead & Henseke, 2017; Kingma, 2018).

The shift to working from home (WFH) has raised substantial questions about how virtual approaches can enable greater temporal and physical flexibility to economies and societies. Remote working offers clear benefits for the employer, such as reducing the need for expensive office space, and the associated climate control, lighting and other costs, as well as some environmental responsibility benefits due to fewer CO^2 emissions related to commuting (Fuhr & Pociask, 2011) and can lead to increased organisational commitment from staff (Felstead & Henseke, 2017). There are also advantages of remote working for employees, such as greater control over time, less or no commuting, more time with the family, job satisfaction and job-related well-being (Felstead and Henseke, 2017). There are also disadvantages: which for employers may include extra investment in IT systems and a loss of more traditional forms of control, and for employees may include loneliness and stress (Crawford, Maccalman, & Jackson, 2011). Until 2020 these had slowed the acceptance of WFH (ONS, 2020); it is to be seen whether the changes forced by the pandemic lockdown will accelerate the uptake in the future.

The lockdown in the UK that began 23rd March 2020. While advantages of WFH can translate into large productivity gains (Laker & Routlet, 2019), and while some academics did partially work from home before, often on research, most teaching and administration was done *in loco*. COVID-19 containment measures created a context where WFH became mandatory almost instantaneously with little or no planning. Although many business schools had wide experience of implementing online or blended learning programmes (Times Higher Education, 2020b), for

the majority it is still a novel form of delivery. Greenberg and Hibbert (2020) argue that the initial shock has the potential to result in professional and personal trauma.

While there have been calls for a stronger focus on the role of instructors in online teaching and learning (Arbaugh, DeArmond & Rau, 2013), a recent meta-analysis by Kumar and colleagues (2019) found only one study examining the perception of academics towards remote learning. There are several plausible rationales, both positive and negative, in the literature to explain why academics may be less disposed towards online teaching and assessment. For example, it has been argued that online delivery may be problematic, compared to face-to-face delivery, since there are fewer visual clues, and less immediacy of responses to questions from the student perspective that may also create difficulties (Nemanich et al., 2009). Furthermore, Yang and Cornelius (2005) and Redpath (2013) point out that developing online material is time-consuming. Electronic marking and feedback can be more time-consuming than more traditional methods (McKinney, 2018). Given the uncertainty and breadth of the COVID-19, this global health crisis disrupts academics' work, careers and their identities as never seen before (Greenberg & Hibbert, 2020). However, we have limited knowledge of academics' perceptions and views of online teaching and learning (for an exception see Ahmed, 2010).

Our study aims to address this issue by using social cognitive theory (Bandura, 1989). We argue that the intersection between remote teaching, social cognitive theory and self- efficacy advances our understanding on possible antecedents of academics' perceptions in response to the COVID-19 lockdown. Self-efficacy beliefs shape individuals' functioning through cognitive, motivational, affective, and decisional processes (Benight & Bandura, 2004). In this article, we argue that people's past experiences affect whether they think in self-enhancing or self-debilitating ways; how well they motivate themselves and persevere in the face of difficulties and radical changes (Bandura, 1997).

While understanding academics' perceptions of online teaching and assessment is relevant, of equal interest is how the shift to WFH and online delivery has impacted on academics' work engagement. This is particularly pertinent as engagement may be a critical factor impacting upon the productivity and well-being of staff in the short-term. The immediate reliance on virtual delivery and assessment, and its potential relevance in the longer-term as many institutions look to maintain online delivery permanently going forward, make the issue of engagement particularly relevant (Beech & Anseel, 2020).

There is a substantial literature on engagement and quality of working life in HE (Barkhuizen, Rothmann & van de Vijver, 2014; Fontinha, Van Laar & Easton, 2018; Fontinha, Easton & Van Laar, 2019; Meriläinen, Kõiv & Honkanen, 2019), as well as some research about burnout and exhaustion (often conceptualised as polar opposites of engagement – González-Romá, Schaufeli, Bakker & Lloret, 2020) in the context of teaching (see Lackritz 2004; Ogbonna & Harris 2004; Watts & Robertson 2011). There is also work examining assessment (Myyry et al., 2020). Most recent literature (Kniffin et al., 2020) suggests that working conditions have deteriorated for many employees. In light of such strains, COVID-19 has contributed to greater risk of employees facing exhaustion and burnout, including permanent feelings disengagement. To date, there is little work on academic engagement, burnout and overall occupational health in the context of online delivery and assessment (an exception is McCann & Holt, 2009).

This raises questions such as: *Given the dramatic nature of the COVID-19 lockdown in 2020 does* ***prior*** *experience of online working determine academics' coping choices? How is the experience of online teaching* ***during*** *the crisis related to perceptions of online teaching and assessment? To what extent has does the ability to remain engaged in work influence how online activities are viewed? and Do potentially important contextual issues, like job insecurity, impact upon views of online teaching and assessment?*

To answer these questions, we developed and implemented a survey instrument capturing the perceptions of a large sample of academics employed in UK Business Schools and economics

departments over the course of the COVID-19 lockdown. While there is extensive ongoing research on the implications of remote work and teaching, most of these studies target individuals indiscriminately, often via snowball sampling. Our previously constructed sampling frame allowed us to target all business, management and economics' academics in the UK and ultimately retrieve a large sample, representative of different types of individuals, institutions and disciplines. We have later been able to collect rich qualitative which as crucial to enlighten our understanding of some of our key survey findings.

Theoretical background and hypotheses development

Experience and perceptions of online teaching and marking

Faced with lockdown many universities, like a range of other institutions, remained 'open for business' - but shifted, overnight, to WFH. For the vast majority of academics this meant going from teaching face-to-face in the classroom to suddenly finding themselves grappling with unfamiliar technology and teaching platforms. This may have been easier in business schools, as many of them were more familiar with blended learning (Times Higher Education, 2020b), but even there the move to full online delivery in a very limited time posed challenges.

Like WFH generally, online teaching and assessment has both advocates and critics. Adopters see virtual delivery as 'the future' for HE, arguing that it enhances higher levels of thinking and problem-solving skills (Politis, & Politis, 2016). Alavi & Galluope (2003) believe it enables enhanced learning and communication. However, Sohn & Romal (2015) conducted a meta-analysis of existing studies to compare student performance between online and traditional classroom environment among undergraduate economics courses in the USA and showed that students initially performed better in face-to-face settings.

Social Cognitive Theory (Bandura, 1986), examines how a person's past experiences impact the way they acquire and maintain behaviour. In particular, this theory advances the idea that individuals' expectations, beliefs, emotional bents and cognitive competencies are developed and modified by social influences that convey information and activate emotional reactions through modelling, instruction and social persuasion. This ultimately affects their perceived self-efficacy (Bandura & Adams, 1977; Bandura, 1986). Individuals' beliefs in their coping efficacy influence their approach toward potential threats and how they are perceived and cognitively processed (Benight & Bandura, 2004). As such, we anticipate that academics who have in the past experienced online or blended learning and engaged in associated social interactions (with

students, administrators and peers) will be able to develop coping strategies that alleviate the strain associated with remote teaching and learning.

As contact with these forms of learning progressively increases throughout the lockdown, academics' views are likely to improve. We hypothesise therefore that:

> Hypothesis 1a. Experience of online activity *prior* to the lockdown will have a positive impact on academics' attitudes towards online work.
>
> Hypothesis 1b. Experience of online activity *during* the lockdown will have a positive impact on academics' attitudes towards online work.

The role of work engagement

Previous research on remote working demonstrates that it is associated with higher organisational commitment, job satisfaction and job-related well-being, but these benefits come at the cost of work intensification and a greater inability to switch-off (Crawford, Maccalman, & Jackson, 2011; Felstead & Henseke, 2017). With the COVID-19 lockdown, remote work in academia became mandatory and this is a major difference from previous contexts of remote work. Furthermore, this change may have been accompanied by increased caring responsibilities at home and by health concerns for some. Hence, we also focus on individuals' ability to engage in work and the extent of work engagement as determinants for individuals' views on online teaching and marking.

Work engagement can be defined as "a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication, and absorption" (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). *Vigour* captures the amount of energy and mental resilience that is maintained whilst working. *Dedication* reflects the degree of enthusiasm, pride and significance that individuals feel about their work. Finally, *absorption* is characterised by the extent that an individual is able to remain ensconced in their work. Work engagement is a crucial factor in sustaining the well-being and productivity of workers as it has been linked to performance, creativity and health (Bakker, 2008).

Engagement has also been associated with the way individuals perceive job demands. When demands are appraised as hindrances they tend to be negatively related to engagement, but when they are perceived as challenges this relationship is positive (Crawford, Le Pine & Rich, 2010). However, there is evidence of reversed causation in which engagement positively influences the way employees perceive job characteristics (de Lange, de Witte & Notelaers, 2018). Similarly, we

expect that higher levels of engagement among academics are likely to influence their perceptions about the new demands associated with online teaching and marking. We hypothesise that:

> Hypothesis 2a**.** Individuals who are more 'dedicated' to their work during the lockdown are more likely to perceive online activity positively.
>
> Hypothesis 2b**.** Individuals who are able maintain the levels of 'mental resilience and energy' are more likely to perceive online activity positively.
>
> Hypothesis 2c**.** Individuals who are more able to remain 'ensconced in their work' are more likely to perceive online activity positively.

Methods

Data and sample

To test the hypotheses a mixed-methods approach was employed, using both quantitative and qualitative methodologies. This study is multidisciplinary and based on a large-scale survey of academic business, management and economics' scholars. The choice of sample reflects the fact that business schools, where economics remains the largest sub-discipline in the UK context, have traditionally engaged extensively with post-experience students, and have been at the forefront of developing online delivery methods for decades (Times Higher Education, 2020b).

The quantitative study

Our research approach combines information from three independent sources: (1) university websites, (2) data on university and business school/ economics departments, and (3) a large-scale survey. The initial stage of the data collection involved capturing data from UK *universities' websites* that included gender and academic rank. Our database contains two overlapping sets of scholars. First in contain all those working in business schools in the UK, including economists. It also includes economists working outside business schools in stand-alone economics departments, or in other areas of universities (such as in departments of education, agriculture, development studies etc.).

The development of the survey took an iterative approach, with the initial survey being piloted on two occasions with eight scholars each time. The online questionnaire was launched on 15th April 2020, less than a month after the lock-down in the UK and the immediate switch to WFH and

online teaching. Recipients were sent an email explaining the purpose of the study, inviting them to participate and including a link to the survey. The survey was sent out in two batches in order to examine if there were any changes over the course of the data collection period. The first wave of the survey was concluded on 8th May 2020. The second wave run from 4th May and was completed by 26th May 2020.

As part of the project, we linked the survey data with public information from websites. To do this, we followed a multi-stage protocol to ensure the de-identification of the data, as was explained to respondents on the project website. First, we replaced the personal names and institutional affiliation information in the survey data with a randomly assigned token number: pseudonymisation. Second, we created another set of random tokens for the individual names and institutional affiliations to be used to capture information about individuals. Third, we linked the two sets of tokens via separate files. All files were individually password protected and held on secure servers. This approach ensured that the survey data and other personal information were never combined on a single file, and therefore the data used for analysis contains no personal identifying information.

We received a response from 2,660 participants. Given that the total population for the survey was 13,048, the response rate was over 20%. Of that response, 2,287 provide usable responses (17%). From this sample, we omitted those who were on research intensive contracts. We also omitted those who were on teaching and research contracts, but who indicated that they were not teaching over the academic year (due to their being on extended maternity leave or on sabbatical).

To check the representativeness of our response pool, we undertook tests of the response population, looking for sources of bias in our final sample. First, we compared the academic hierarchy titles of those completing the survey against the academic hierarchy titles of those who were included in the overall sample. Second, we checked whether our sample matched the distribution of type of institution, distinguishing between 'elite' Russell group institutions and others. In both cases the sample was consistent with the original population

Measures

Dependent variables

A central concern of the study is to examine how individual academics view online activities relating to teaching and assessment. Our discussions with faculty, both experienced and inexperienced in online delivery, highlighted distinct perspectives that influence academics' views

and experiences of online delivery. Specifically, some academics worried whether online delivery could 'make it difficult to know whether the students understand what is being taught' due to the lack of visual clues and immediacy of responses to questions, as work from the student perspective suggests (Nemanich et al., 2009). Second, developing online material is often cited as involving more time due to the requirement for academics to design an effective online learning environment. Initial preparation times may be greater for some academics depending on the nature of the cohorts they are teaching. Having diverse cohorts may require academics to tailor their materials. Where courses are taught on multiple occasions using similar materials or recordings, then the sunk cost of preparation online may be more easily spread. A potential flip side of the time devoted to preparing online material is that it may require a more structured discussion of the topic: it 'enables me to plan my delivery more carefully and provide a better teaching experience' (Benson et al., 2011). It is also possible that without the advantages associated with face-to-face teaching, such as being able to react to student's visual clues and responses, 'over planning' of online teaching leads to a more restricted experience. Therefore, we asked whether participants consider online development 'more time-consuming to prepare' (Yang & Cornelius, 2005; Redpath, 2013).

We take an analogous approach to assessment where we examine three distinct arguments. The first relates to whether faculty consider that marking online is more time-consuming than marking hard copy and feeds into an established debate in the literature (Redpath, 2013; Lackritz, 2004). Second, we examined whether online marking on screens is more tiring (McKinney, 2018, pp. 236). Finally, we investigated whether online assessment 'enables (faculty) to provide better and more considered feedback', as the literature suggests (Evans, 2013; Nicol, 2010).

In Table 1 the top panel shows participants' perceptions of online teaching while the lower one details perception of marking. 78% of respondents agree that teaching online 'makes it difficult to know whether the students understand what is being taught'. Table 1 suggests that there is an increased toll of online marking, with more individuals agreeing that it was 'more tiring' than those who disagree; and a similar proportion of participants agreeing that marking online is more 'time consuming' as those disagreeing. A third of respondents think that online marking enhances the quality of their feedback. We note that the correlations between the explanatory variables are not distinctly high with all variables, but that between the first two teaching dependent variables (0.72), and between the three engagement variables (0.60-0.81), being below 0.4.

<Table 1. Perceptions of online teaching and assessment ABOUT HERE>

Key independent variables

Teaching and marking prior to or during the lockdown:

Experience of online delivery. If participants responded yes to the question 'Do you typically teach online or remotely?' the variable was coded 1 and 0 otherwise.

Experience of online marking. If participants responded yes to the question 'Do you typically mark online or remotely?' the variable was coded 1 and 0 otherwise.

Teaching online due to lockdown. If participants responded yes to the question 'Have you been involved in online delivery because of the COVID-19 lockdown?' the variable was coded 1, and 0 otherwise.

Marking online due to lockdown. If participants responded yes to the question 'Have you been involved in online marking because of the COVID-19 lockdown?' the variable was coded 1 and 0 otherwise.

Engagement. We use the nine-item Utrecht work engagement scale (Schaufeli et al., 2006), structured in a seven-point Likert scale. Engagement is captured by three concepts in that scale – *dedication*, *vigour* and *absorption*.

Job insecurity. We capture perceptions of job insecurity through two variables measured on five-point Likert scales. The first variable captures responses to two questions asking the extent to which participants agreed with the following statements: 'I feel insecure about the future of my job.' and the second 'I feel that if I lose this job, I would easily find a better job'.

Academic rank. Based on information gathered from websites, we created a dummy variable to capture academic rank, distinguishing between the three most common ranks of Professors/ Chairs, Associate Professor/ Reader/ Senior Lecture/ Principal Lecturer, Lecturer/ Assistant Professor as well as Research Fellow, Senior Research Fellow, Teaching Fellow, Senior Teaching Fellow and 'Other' titles. make up the remaining 13%. We aggregated the research intensive Research Fellow and Senior Research Fellow roles, and teaching intensive Teaching Fellow and Senior Teaching Fellow roles for the analysis.

Additional variables:

Other individual level variables. Based on information gathered from websites, we created a dummy variable to capture *gender*, equal to 1 for male and 0 for female academics. Appendix Table 1, which summarises the additional variables used in this study, shows that 53% of the sample are men. We derived five further variables that capture different activities that compete for the time

available for academics to devote to teaching and assessment. We capture childcare commitments through two variables. First, we created a binary variable equal to 1 if the individual had children under 5 and 0 if they did not. Second, we included a variable, *change in proportion of time devoted to child care*, that is calculated as the difference between the amount of time devoted to childcare before and during the lockdown: 'hours you spend on childcare during the COVID-19 lockdown each week' divided by 'hours you typically spent on childcare per week (prior to the COVID-19 lockdown)' multiplied by 100. To capture the amount of time devoted to research we use information on the *proportion of time allocated to research* over the lockdown period as a percentage of total activity. Finally, we capture the extent of *involvement in administrative activities*: 'How would you characterise your administrative workload since measures were taken in response to the COVID-19 Lockdown' on a 5-point scale ('decreased significantly', 'decreased', 'did not increase nor decrease', 'increased', 'increased significantly').

Segmentation and institutional characteristics. There is considerable organisational variety between universities in the UK. We distinguished between 'old'/pre-1992 universities that tend to have a strong orientation towards research (e.g. Oxford and Cambridge), and 'new'/post 1992 ones, that are more teaching or industry orientated (e.g. Sheffield Hallam and Gloucester). What has been clear, even prior to the lockdown (Guardian, 2020), is that UK Universities' exposure to the international student market is likely to be adversely affected and impact finances significantly. The extent to which different institutions were able to potentially absorb the effect of reduced numbers is conditioned by their financial status and the extent they are exposed to the post-graduate market. To capture these effects, we include a variable capturing the *number of post-graduate students*; the *surplus/ deficit of (each) institution* and its *total income* levels (all in 2018/19 terms. Source: Higher Education Statistics Agency (HESA)).[1] We also capture the recently developed institutional system for grading teaching quality ranking in the Teaching Excellence Framework (TEF) that ranked on three level grading structure of gold, silver and bronze and included most English and some Scottish institutions (source: Office for Students).[2]

We included *field* dummies to consider any field-specific heterogeneity. This information was based on a question asking respondents to indicate their primary area of expertise using the subject classifications in the *Academic Journal Guide 2018* which is widely used in the UK (Walker et al., 2019) and includes 22 disciplinary areas. We also control for two further factors to capture change over the sample period. We also provide separate dummies to capture whether

[1] HESA data was taken from https://www.hesa.ac.uk/data-and-analysis.
[2] TEF data are found at https://www.hesa.ac.uk/data-and-analysis.

economists in the sample are working in business schools, in economics departments, or in other parts of their institutions. First, we control for which wave of the survey individuals were located in. Second, we control for the week that each individual completed the survey – this allows the verification of potential different patterns of response as activities such as marking may have been more intensive at later stages of the survey being online.

The qualitative study

Our qualitative study was designed to elicit more details about the assumptions underlying Hypothesis 1a and 1b and sought to explore further the assumptions underpinning H2a- 2c. At the end of the survey, respondents were asked whether they were willing to participate in a follow-up study. Around 1,200 participants signalled initial interest to participate. Our inductive approach was based on theoretical sampling, which involved the selection of potential respondents based on their ability to illuminate and extend the relationships we hypostasized quantitatively and to develop deeper understanding on the factors shaping academics' views and experiences (Eisenhardt & Graebner, 2007). An email invitation for an interview was sent to 150 potential participants. The final sample included 49 individuals. The semi-structured interviews lasted between just over 30 and more than 60 minutes. 21 of the participants were male, 28 reported living with a spouse or partner, and 16 had young children. All interviewees were working and held a variety of academic positions (teaching/ research fellows, lecturers, associate and full professors). Interviews were conducted via Microsoft Teams, Zoom, Skype and phone calls. The majority of interviews were, with permission, either video and/ or audio recorded. In case the respondents did not agree on recording intensive notes were taken. In such cases a trained research assistant supported the process of taking notes. Based on observations during the interviews extensive notes on non-verbal cues were taken.

The primary purpose of the interviews was to collect more in-depth data on academics' personal and social context, their views and experiences around online teaching and learning and their perspectives on WFH and their jobs. Further, we were interested to explore the intersection between family and working within the personal space. As suggest by Braun and Clarke (2006) a thematic analysis approach was employed to interpret the interview data, as it allows for both a realistic and constructivist approach. Thematic analysis supported the search and organisations of themes identified as being important in descriptions of topics of interest; through reviewing the data in multiple rounds (Fereday & Muir-Cochrane, 2006).

We used QSR NVivo version 12 to interrogate the data and identify the emergence and persistence of themes. Consistent with the principles of inductive data analysis (Miles &

Huberman, 1994), the coding of the data and the development and revision of categories took place through an iterative process with the researchers agreeing upon the prevalence and interpretation of central themes and, over time, aggregate dimensions that link to theoretical constructs. During the process of coding the data in iterative cycles and moving back and forth between the whole interview and the detail relating to views and experiences of online teaching and assessment, job engagement and security, memos were written about emerging themes across the interviews as well as in relation to the fine detail within each interview.

Results

Descriptive analysis

Table 2 provides summary statistics and shows that only a minority of participants, 18%, had prior experience of typically teaching online, while in contrast 77% had prior experience of online marking. The majority however were teaching and marking online during the pandemic. Table 2 also shows that of the three components *vigour* was substantially lower than *dedication* and *absorption*. It also indicated that a significant proportion of the sample is concerned about their jobs. While the negative impacts of low levels of perceived job security can be buffered by high employability levels (Silla et al., 2009), that is not the case given the context of the lockdown as reflected in 43.9% feeling insecure. Few felt trading up to another position is possible (8.6%).

< Table 2. Summary statistics for key independent variables ABOUT HERE>

As an initial look at the relationship between teaching and marking and experience and learning, Table 3 summarises the mean impact across the key independent variables cross-tabulated against positive and negative views. Given the variable is a 5-point scale a mean figure of 3.0 implies that there is no strong tendency ('sometimes') while a figure greater than three implies 'agreement' and below 3.0 a propensity towards 'disagreement'. Thus, Table 3 suggests that seasoned online teachers (Column 2) are likely to be more positive/ less negative, than colleagues for whom such activities are novel in both teaching and marking. The majority of experienced teachers that consider that preparation time for teaching online was higher than for face-to-face delivery (mean of 3.8 in Column 2), but they also considered that teaching online is likely to reduce student understanding in the online environment (3.6). However, compared to those with either do not normally teach online, or those who were obtained their teaching experience over the pandemic period, experience teachers were more positive. Differences between academics who had taught online due to the pandemic (Column 3) and those how did not teach online (Column 1) were small. In contrast, looking at the marking it is notable that who did not normally

mark online but had to do that whilst WFH, while not as positive/ less negative than those who marked online normally, were considerably positive/ less negative than those who did not mark online. This may suggest that past experience reduced the perceived amount of work associated with marking.

< Table 3. Difference in mean responses of individuals who marked prior, and those that marked during, the Covid lockdown ABOUT HERE>

While these descriptive tables highlighted that there are differences academics experiences different in relation to their teaching as opposed to marking. Given these different patterns we examined each survey question as a dependent variable in a series of separate estimations. Since the dependent variable is ordinal, we implement ordinal logit specifications. In order to test the parallel lines assumption, we applied the Brant specification test, but found insignificant differences, indicating the assumption was not violated. We present results in Table 4. To ease interpretation, odds ratios (ORs) are calculated and reported throughout. Coefficients bigger than 1 indicate that perceptions a positive relationship between the dependent variable and the independent variables, while coefficients less than 1 indicate a negative relationship.

While there are some differences across variables, there is consistency in the findings for many of the key hypotheses. We find that past experience of online activity has a strong positive impact on coping choices, supporting Hypothesis 1a. Specifically, in terms of percentage change, the odds of perceiving that online reduces understanding is (1-0.462)*100%=53.4% lower for those who have had online teaching experience prior to the lockdown compared to those who have not. Experienced online teachers are more than twice as likely to consider that working in an online environment enhances their planning. Interestingly, we found that experience in online teaching leads to individuals being about 30% more likely to consider that preparation is greater. This enhanced preparation required will plausibly be beneficial to learning, however, it also has the less positive implication that, unless adequately resourced, it creates greater demands on instructor's time. We found no indication that experience of online activity during the lockdown is positively related to perceptions of working virtually (i.e. Hypothesis 1b was not supported).

< Table 4. Ordered Logit Estimates (odds ratios reported) - Dependent variables: Views of online teaching and assessment ABOUT HERE>

The findings are even stronger for marking, with experienced online markers being 77% more likely to consider online marking to be more time-consuming compared to those who had no experience. Similarly, experienced online markers were over 70% more likely to find online marking more time consuming. With respect to the quality of feedback, the findings suggest that

experienced online markers were some three times more likely to consider the online environment to be beneficial in this respect. These findings provide strong support for Hypothesis 1a. While responses of the questions directed towards virtual teaching did not indicate any learning effects, the results support the hypothesis that experience of online activity during the lockdown is positively related to perceptions of marking virtually (hence Hypothesis 1b is supported). It is noteworthy that the learning-by-doing associated to experience in marking is 'incomplete' in the sense that there were substantial differentials in the extent that instructors who developed their experience prior to the pandemic and those who obtained that experience during it. The differentials were large in all cases but were most substantial with respect to whether participants considered that online marking lead to better feedback where those who had experience *during* the pandemic were a, not insubstantial, 27% more likely to agree, as opposed to those who had experience *prior* to the pandemic being about three times more likely to agree (a differential of 178%).

We then examine Hypotheses 2a-2c. We find strong evidence that when academics are struggling to maintain their resilience and energy levels (*vigour*) and this is negatively associated with their views of online teaching and assessment and marking (Hypothesis 2b). However, we found very little evidence to support a relationship between the other two facets of engagement: *dedication* or *absorption* (Hypotheses 2a and 2b are not supported).[3] Hence, intriguingly, the findings suggest that academics with higher levels of dedication and those who are able to remain ensconced in their work were no more or less likely to have a preference for online delivery.

A number of the additional variables are also determinants of perceptions of WFH. Job insecurity plays a significant role in how faculty view the online experience, being a robust determinant across teaching and marking. In line with literature, job insecurity has detrimental consequences for employees (Sverke et al., 2002; Schumacher, et al., 2016). On the other hand, being confident about the outside options available to individuals makes them more positively disposed toward the view that online teaching leads to enhanced planning (Silla et al., 2009). Overall, the findings suggest that the effects of job insecurity have a more pronounced and well-defined impact on perceptions than their ability to benefit from outside options; a finding that is plausible in a context of high job insecurity caused by a crisis (Peiró, Sora & Caballer, 2012).

[3] As noted when defining the independent variables, the engagement variables were the only ones that exhibited higher levels of collinearity, most particular between the dedication and absorption variables at (0.8). We tested whether multicollinearity was driving the 'non-results' omitting each of these variables in turn, and found that the coefficients were still not well determined (below the conventional 5% level of statistical significance).

Of the variables that relate to academic's time, we find that administration is the most robust determinant. Of the institutional variables, the only one that was significant in relation to assessment is the number of post-graduate students. Of the control variables, we found that nine of the 132 field variables were significant at the 5% level and there are no discernible patterns across any particular field. We did not find any significant difference between economists working outside business schools (in economics departments or in other departments). Nor did we find that the second *wave* or *week* effects had a significant impact on the dependent variables. That there was no change in views over the period analysed is interesting as it may imply that there are no short run learning effects, beyond those identified directly in relation to marking, which does not support Hypothesis 1b.

Table 5, examining experience, probes the findings more closely by interacting with the different academic ranks. The findings suggest, relative to the reference group of teaching-intensive ranks, that all other groups have less positive (more negative) perceptions of online delivery. We examined whether higher-ranked faculty are more likely to be more positively/ less negatively disposed to online delivery compared to more junior lecturers. We did not find this to be the case, indeed we found that lecturers and professors are more enthusiastic than associate professors: for example, professors have (1-0.589)*100%=41.1% lower likelihood of perceiving that online teaching reduces understanding while associate professors have an odds ratio of 60.8%. Experienced professors are 2.30 times more likely than their peers to consider teaching online enhances planning, lecturers are 2.11 times more likely than associate professors to consider teaching online and enhanced planning, while associate professors were 1.88 times more likely than their peers to consider teaching online and enhanced planning.

< Table 5. Ordered Logit Estimates (odds ratios reported) - Dependent variables: Views of online teaching and assessment – Rank differences ABOUT HERE>

The findings with respect to the amount of time that is invested in teaching and marking suggest there are differences between hierarchical positions. For example, with respect to teaching, there is no significant difference between professors and lecturers. This was not the case with respect to marking where we found that professors with experience of online marking have a lower likelihood of perceiving online marking to be more time consuming (OR=0.68), while lectures had an even lower likelihood (OR=83%) suggesting that even with more experience in the short run, marking online may have a more negative effect on the time junior faculty than it does on professors.

Qualitative evidence

Online teaching and assessment

While a number of respondents reported positive views and experiences with online teaching and assessment, most are stressed and anxious about virtual teaching. In particular, academics familiar with advanced technologies reported more effective coping choices. For example, one participant mentioned that:

> I am not afraid to try out new technologies.(…) Remote working just a logical next step. I am excited and grateful to be part of a major change in the higher education sector.
>
> Lecturer

Some groups, such as parents with young children, are disproportionately affected, referring to increased difficulties in balancing teaching and childcare commitments. This becomes particularly difficult when synchronous teaching assignments conflict with feeding or caring times of babies and young children Family status appears likely to disparately affect how this global health crisis impacts individual's life and work (Kniffin et al., 2020). As our data shows, male participants are less affected by family responsibilities and childcare than women. Across the sample, women participants reported higher workload associated with household chores and childcare.

Participants reported increasing workloads associated with the preparation of online classes and those with least pre-experience with online teaching and assessment report the most difficulty. For example, one respondent stated:

> At the moment I am working seven days a week. Online marking is still going on and we have already started to modify the content for the autumn term. Normally, I use the summer to catch up on my research, but this year it is all about teaching and marking.
>
> Professor

Another respondent associated mental and physical stress and exhaustion with remote working. He made a remarkable comment about remote working:

> In a recent department meeting, we discussed the challenges and advantages of working from home and realized that we should rather talk about living in the office rather than working from home. Having the work always within your personal space limits the possibility to distance yourself from it.
>
> Senior Lecturer

One participant associated higher workloads with the disappearance of work-life balance:

> Few months ago, we could go to the office to work and return home to rest. We had a choice! I think such a physical separation is essential maintain a good mental and physical health. Now, we are not working from home. Instead we are living in our offices.
>
> Associate Professor

Most respondents also reported lower rates of engagement among their students in an online environment compared to their experience of face-to-face teaching. Generally, students did not switch on their cameras so teachers had no idea whether students are even in the room, following the class. There is widespread concern about students' learning – the students, too, have limited experience with online teaching and learning. Most of the interviewees expressed dissatisfaction with the idea of only online teaching with most respondents stating that online delivery is not of the same quality as conventional face-to-face teaching environment because they felt it did not lead to a good learning experience. However, across the interviews, academics expect that the 'new normal' will look different to the pre-2020 situation. Across the sample, participants expected that some elements of remote teaching and learning will be maintained post COVID-19. These findings are of particular interest given that it was the case that only a small minority of those in the full sample (18%) had been engaged in online delivery.

Work engagement

A large number of the participants were generally satisfied with their jobs, though some reported a change in the ways they feel about them. The unexpected move to WFH, and online teaching and assessment, has been stressful and feels uncoordinated. Although most higher education institutions offer support, academics viewed institutional support as being limited. The uncertainty associated with WFH, and the blurred lines between workplace and private social space were viewed by a number of respondents as unfortunate: academics missed their workplaces and the social connection with their colleagues and students:

> I enjoy most the time in the classroom. This is the place which inspires and challenges all the time. In fact, the being surrounded by students, having challenging conversations with my colleagues over a cup of coffee, was the best part of my job. At the moment, I am not sure how to feel about my job…
>
> Lecturer

In spite the radical changes in their working routines, the majority of the respondents made clear with their statements that they felt obligated to deliver best possible learning experiences to their students and communities. These findings align to the quantitative results in highlighting that

academics remain as 'dedicated' and 'absorbed' in their work, but struggle to maintain the same levels of 'vigour'.

Some academics reported that their relationship with their line manager has been negatively impacted since, for example, head of schools were overloaded with administrative work and there was little or no interaction with faculty members. Some participants feared pay cuts and argued that they would not get involved in any voluntary tasks if their institution implemented them, switching to doing the minimum to maintain the basic requirements of the job.

Job insecurity

Interviewees were worried about the reduced number of international students and associated shortfalls in the university budgets and job security is a major concern. Many respondents said that the uncertainties in HE sector keep them awake during the night. Some were considering working outside the UK. Others were worried about their financial commitments. In these conversations a few of the interviewees got emotional and some broke into tears. For instance, one respondent made the following statement:

> I am 62 and I always thought my jobs is secure. However, as the lockdown showed us, nothing is really guaranteed. My university will most likely lay off a number of people. If I lose my job, no one is going to hire me again. I have five years of my mortgage to pay. So, I will not only lose my job I will also lose my home. What am I supposed to do? How can I concentrate, give the horrifying future outlook?
>
> Teaching/Marking Fellow

Our data also shows that ethnic minorities worry more about the future of their jobs than their Caucasian counterparts. In a number of interviews respondents with a black, Asian and minority ethnic (BAME), participants were reporting higher stress and anxiety level associate with the fear to be laid off first because of their skin colour:

> I always put a lot of effort in my work because I have to work harder, so my achievements are noticed. Given the current uncertainties, I am worried all the time. I work even more out of fear be asked to leave first. I know nobody wants to hear it, but I know that a black person would be fired first.
>
> Lecturer

In summary, our qualitative data supports our findings from our quantitative study but highlights a number of factors beyond those findings, exploring further the gender related inequality or the impact of COVID-19 on academics with BAME background.

Concluding discussion and limitations

Moving to home working will most likely affect productivity across a range of sectors and there is a need for research to assess whether the pandemic and the associated lockdown has accelerated the use of WFH and the extent that working patterns will revert to the *status quo ante*. In the HE sector, there is an expectation amongst business school and economic academics that the lockdown will have increased the likelihood of universities moving towards 'blended learning' and beyond online assessment that is already being the most common form of assessment. This will have significant implications for the roles that universities can play in society, for students and the student experience and, as we explore here, for academics. Our research provides valuable insights from a large, representative, sample of academics who been working at the 'coal face' of remote work since the lockdown commenced in the UK.

Online delivery in HE has been touted as a potential panacea which can enable scaled delivery. Given the longer-run concerns about the UK's declining productivity since 2005, its large-scale service sector dependency, the coronavirus pandemic and the large-scale lockdown induced recession resulting from it, an appreciation of potential benefits is of interest beyond HE (UK Parliamentary Post, 2020). In this respect, our findings show that the vast majority of those involved agree that online teaching is 'a lot more time consuming to prepare' is sobering. Academics with previous online experience are more likely to consider preparation takes more time than novices do, but all agree that it is more time consuming to prepare for online than for face-to-face delivery.

This contrasts with our findings about differences over time within our survey, but it seems likely that the short space of time was not enough for the effects of these experiences to translate to behaviour and that the extent of pre-lockdown experience is a better guide and more consistent with social cognitive theory. In line with our findings, a profound sense of self-efficacy to manage remote teaching and learning is a main requirement to its successful adoption. Hence, it requires time and space to build a resilient sense of efficacy (Benight & Bandura, 2004) to manage effectively new form of working and teaching. Academics can draw strengths from their experiences during the lockdown. The overnight move to online teaching and marking gave academics the opportunity to gain new skills and competencies (Greenberg & Hibbert, 2020).

The fact that the amount of work involved in online teaching and marking is being underestimated raises concerns for academics, many of whom are already under pressure at home, and also have research and administrative responsibilities. It is also raising alarm bells for universities, who are already taking steps to tighten their belts at a time there is going to be, for most, more work to be

online approaches, as Redpath (2012) suggests. Thus, it may be that the technological capability of remote learning has found, force majeure, a context where the opportunity for a large increase in distance learning can be created.

A majority of academics in UK business schools also find online marking requires at least as much time as, and the time devoted to marking on screen is more tiring than, marking physical copy, consistently with McKinney (2018, pp. 236). However, experience of online marking is a factor driving positive views of such marking, suggesting the potential for productivity gains as faculty continue to adapt to the online world. It was also the case that even in the relatively short time since the lockdown had occurred that there were positive learning benefits. They paint a quite positive picture with respect to this element of online activity given the strong view of experienced markers that they are able to provide higher quality feedback online.

Overall, the findings suggest that both academics experience in online delivery and those with such experience prefer face-to-face delivery to enhance understanding and control preparation time but appreciate the benefits of enhanced planning of course material required by online work. This leaves open the possibility that there may be benefits in 'cherry-picking' online and face-to-face elements via blended learning. Certainly, but partly by necessity, some institutions have shown a preference towards blended learning (Time Higher Education, 2020a). This is particularly true in Business Schools as many of them have been gaining wisdom from decades of experience in offering distance and digital learning to students (Times Higher Education, 2020b). That said, our finding that only a minority had online teaching experience in what is a highly internationally focused market, the UK, suggests that there is considerable scope for diffusion of online activities. But as we show, unlike in the marking domain, experience over the lockdown did not enhance academic's perceptions of online delivery.

A plausible reason for this is that the amount of time and training is considerably greater in order to become proficient and confident in an online arena. Additionally, the short onset period of the lockdown lead to faculty having to move online in a short time period. The findings with respect to marking suggest that 'learning-by-doing' with online activities leads to as faculty become more comfortable and able to appreciate the pedagogical benefits of online delivery reducing bias against on line learning (Redpath, 2012). This is comforting, given that online teaching delivery, to a great or lesser extent, will be the norm in the UK and elsewhere, as it is a necessity in the next academic year.

In UK business schools, faculty who were unable to maintain their energy levels were less likely to focus on the positive elements of the online experience. This confirms previous research (de Lange

et al., 2018) that lower levels of engagement negatively affect individual's perceptions of job demands. In line with most recent literature (Kniffin et al., 2020), our study supports the notion that organizational commitment to academics' professional development and personal well-being during the crisis will lead to sustainable and fruitful working environments.

Line managers, and the institutions for which they work will need to be sensitive to their staff's needs, support them in developing necessary skills and keep them from falling into mere presenteeism, as the quality of online learning may be determinant for the survival of many UK HE institutions in an environment where satisfaction with online provision has fallen compared to prior to the COVID-19 lockdown (Times Higher Education, 2020b). Furthermore, institutional support (e.g. time and space) is required to grow professionally and personally when we emerge from this pandemic (Greenberg & Hibbert, 2020).

Labour market uncertainty is a potentially significant hindrance to staff who have a positive perception of, and willingness to work within, online teaching and assessment. It is hard to be motivated, and staff who feel that they may soon be out of a job will see little point in developing online materials. There are fewer outside options available to staff in a recession (Peiró et al., 2012) and we did not find those with strong outside options were any less positive (more negative) about online delivery or assessment. Job insecurity is potentially higher among academics with a BAME background. HE institutions may consider to provide differential resources and opportunities to minimise discrimination towards minorities (Bapuji, Ertug & Shaw, 2020). Furthermore, according to Probst et al. (2007) job insecurity is positively related to productivity, but negatively related to creativity, which may actually be a great source of concern, especially as creativity may be a crucial element for the quality of online delivery. Our findings suggest that being able to provide a secure environment for staff will be an important factor in ensuring that staff embrace online delivery.

Although our cross-sectional data does not allow us to test causality, our findings suggest that low levels of vigour are associated with more negative perceptions of job demands due to online learning. These could potentially then have negative implications on individual performance (Bakker, 2008). Our qualitative data suggests that such low levels of vigour may be also due to contextual factors such as living with others, having limited space to work and, most of all, parenting responsibilities towards young children (particularly for mothers).

Our findings relating to the negative effects on engagement, and associations with online delivery suggest that while there is a potential that learning-by-doing associated to the enforced online delivery may help to breakdown instructor bias, this is contingent on environmental factors.

Individuals and managers will need to find means and interventions to be able to sustain their engagement, which can include personal resource building, job resource building, leadership training and health promotion activities (Knight, Patterson & Dawson, 2017). While there is abundant research evidence that online learning is just as effective as classroom learning, a bias toward face-to-face delivery exists. The lockdown movement may have the potential to enhance the shift to online delivery, but the absence of investment and adequate resourcing institutions, could lead to lower quality outcomes undermining the confidence of students and academics.

There are several limitations to our research approach. First, our study is based on a survey of business, management and economics' academics in a single country, which limits the generalizability of our findings. In our defence, within the wider debate there has been a long linage of research focused on business schools, reflecting their being traditionally engaged extensively with post-experience students, and having been at the forefront of developing online delivery methods for decades (e.g. Webster and Hackley, 1997). These schools are the focus of an existing substantive literature and capture a broad set of disciplines from the humanities (e.g. business history) to more scientific domains (e.g. IT). In addition, we did not find that there was a difference between economists working in economics departments and as economist in other departments providing further that our finding can be generalised within the social sciences. Further research in this sector in other countries and further research into working at home in other sectors would help to set this study in context.

While we focus on the significant, but surprisingly little studied group of academics in terms of teaching and learning, it would be useful to match the views and experience of the students that are being taught and to gather insights from both parties in order to enhance the learning process. We suspect that doing so would be particularly valuable to better understand what elements of virtual and face-to-face teaching could best be blended to obtain the best possible learning outcomes. It would be useful to take a more rounded view by also looking at components relating to learning development and the social and networking elements of education.

Fourth, our survey studies academics over a short time horizon. While having a solid representative database of all academics in business schools enabled us to act quickly and to carry out research much closer to real time than is normal in the scholarly field, we feel we can credibly compare the effect of events prior to and during the lockdown, and are able to test whether views changed over the 5-week period when the study ran. By its nature the research does not allow us to comment on whether the learning effects we observed will translate into future teaching, nor whether academics will wish to move to online delivery more extensively following the lockdown. There is considerable debate that there will be permanent shifts due to the lockdown, but at this

point these remain largely a matter of speculation rather than being grounded in empirical research. Findings from the study provide a tantalizing suggestion that learning-by-doing has altered the perception of instructors facilitating such a shift. While there are many reasons why institutions, academics and students may prefer to spend more of their working lives at home, it is also the case that these rationales existed prior to the lockdown and there are negatives too and that the balance has been discussed for decades with change being gradual. Addressing this issue is an important one for future research.

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Table 1. Perceptions of online teaching and assessment (proportion of responses on a 5-point scale)

	Disagree/Strongly Disagree	Sometimes	Agree/Strongly Agree
Teaching			
* Enables me to plan my delivery more carefully and provide a better teaching experience	54.9	24.5	20.6
* Makes it difficult to understand whether the students understand what is being taught	11.4	10.6	78.0
* is a lot more time consuming to prepare	10.6	13.9	75.5
Marking			
* Is more time consuming than marking hard copy	38.7	22.2	39.1
* Is more tiring	28.7	20.1	51.1
* Enables me to provide better and more considered feedback	26.2	39.1	34.8

Note: Five-point scale has been simplified into three groups for expositional purposes.

Table 2. Summary statistics for key independent variables

		Mean	Std. Dev.	Min	Max
Teaching & marking prior to or during the pandemic	Experience in on-line delivery	0.18	0.38	0	1
	Teaching on-line due to pandemic	0.76	0.22	0	1
	Experience in on-line marking	0.77	0.42	0	1
	Marking on-line due to pandemic	0.73	0.33	0	1
Engagement	Dedication	5.04	1.15	1	7
	Vigour	4.10	1.16	1	7
	Absorption	4.98	1.06	1	7
Job insecurity	Job insecurity	3.21	1.18	1	5
	Confident about outside work options	2.29	0.97	1	5
Academic Rank	Professor	0.20	0.40	0	1
	Associate Professor	0.36	0.48	0	1
	Lecturer	0.31	0.46	0	1
	Research Fellow/ Senior Research Fellow	0.03	0.16	0	1
	Teaching Intensive Role	0.09	0.28	0	1
	Other	0.02	0.14	0	1

Note: Text describes the variables.

Table 3. Difference in mean responses of individuals who marked prior, and those that marked during, the COVID lockdown

	Experience		
	Do not normally Teach/Mark online	Normally Teach/Mark online	Teach/Mark online due to pandemic
Teaching			
* Enables me to plan my delivery more carefully and provide a better teaching experience	2.4	2.9	2.4
* Makes it difficult to understand whether the students understand what is being taught	4.1	3.6	4.0
* is a lot more time consuming to prepare	4.1	3.8	4.1
Marking			
* Is more time consuming than marking hard copy	4.1	2.8	3.2
* Is more tiring	4.2	3.2	3.5
* Enables me to provide better and more considered feedback	2.4	3.2	3.0

Table 4. Ordered Logit Estimates (odds ratios reported)- Dependent variables: Views of online teaching and assessment

		Reduces understanding		Enhances Planning		Increases Prepartion Time		More time consuming		Can lead to more considered feedback		Is more tiring	
		Coeff	z-stat	Coeff	zstat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat
Teaching & marking experience	Experience in on-line delivery	0.462 ***	(5.80)	2.144 ***	(5.80)	0.684 ***	(2.83)						
	Experience in on-line marking							0.223 ***	(10.21)	3.053 ***	(7.76)	0.295 ***	(8.29)
	Activity on-line due to pandemic	0.750	(1.27)	1.342	(1.26)	0.738	(1.34)	0.798 **	(2.15)	1.265 **	(2.18)	0.766 ***	(2.53)
Work engagement	Dedication	1.066	(0.76)	1.145 *	(1.69)	0.991	(0.10)	0.935	(0.85)	1.069	(0.84)	0.916	(1.10)
	Vigour	0.661 ***	(6.32)	1.345 ***	(4.69)	0.839 **	(2.75)	0.873 **	(2.21)	1.076	(1.17)	0.807 **	(3.46)
	Absorption	1.068	(0.78)	1.032	(0.39)	1.036	(0.42)	1.079	(0.96)	1.011	(0.14)	1.160 *	(1.84)
Job insecurity	Insecure about job	1.185 ***	(3.77)	0.906 **	(2.27)	1.152 ***	(3.17)	1.169 ***	(3.55)	0.925 *	(1.78)	1.222 ***	(4.61)
	Confident about outside work options	0.945	(1.05)	1.122 *	(2.20)	0.965	(0.65)	0.980	(0.40)	0.953	(0.92)	0.978	(0.43)
Academic Rank (Ref. Teaching Intensive roles)	Professor	0.598 **	(2.31)	0.617 *	(2.23)	1.052	(0.22)	1.464 *	(1.77)	0.659 *	(1.90)	1.565 **	(2.07)
	Associate Professor	0.690 *	(1.84)	0.737	(1.57)	0.910	(0.46)	1.277	(1.27)	0.590 **	(2.68)	1.395 *	(1.72)
	Lecturer	1.003	(0.02)	0.816	(1.06)	1.013	(0.06)	1.228	(1.07)	0.652 **	(2.18)	1.261	(1.20)
	Research Fellow/ Senior Research Fellow	0.560 *	(1.68)	0.669	(1.24)	0.877	(0.37)	1.222	(0.60)	0.581	(1.58)	0.980	(0.06)
	Other	0.786	(0.60)	0.463 *	(1.92)	0.636	(1.13)	1.032	(0.08)	0.358 **	(2.38)	1.248	(0.58)
Demographic	Gender	1.217 **	(2.28)	0.947	(0.64)	0.925	(0.85)	1.009	(0.10)	0.942	(0.71)	0.895	(1.33)
	Child under the age of 4	1.090	(0.62)	0.835	(1.43)	0.808	(1.57)	0.837	(1.38)	0.972	(0.23)	0.801 *	(1.73)
Non-teaching activities	Involvement in administrative activities	0.865 **	(2.51)	1.127 **	(2.14)	0.682 ***	(6.66)	0.802 **	(4.07)	1.024	(0.43)	0.726 ***	(5.84)
	Proportion of time devoted to research (%)	1.004	(1.53)	0.998	(0.97)	0.992 ***	(3.37)	0.997	(1.37)	1.003	(1.32)	0.998	(0.83)
	Change in the prop of time devoted to child care (%)	1.004	(1.19)	0.996	(1.28)	1.006 *	(1.76)	1.000	(0.09)	1.004	(1.12)	1.002	(0.64)
Institutional environment	Surplus of deficit of institution (% of total income)	1.271	(1.53)	0.866	(0.96)	1.126	(0.77)	0.880	(0.84)	1.280	(1.61)	0.918	(0.56)
	No. Post-Graduate Students (000s)	1.011 *	(1.88)	1.003	(0.61)	1.000	(0.05)	0.992	(1.42)	0.996	(0.79)	0.992	(1.37)
	Total Income (£000s)	1.000	(1.48)	1.000	(0.00)	1.000	(0.20)	1.052 **	(1.96)	-0.952 *	(1.78)	1.053 **	(2.00)
	Total Income	1.000	(1.54)	1.000	(0.46)	1.000	(0.77)	1.000	(1.12)	1.000	(0.20)	1.000	(1.21)
	Teaching Excellent Framework (TEF)	0.919	(0.47)	1.243	(1.25)	1.183	(0.92)	0.934	(0.39)	1.288	(1.42)	1.060	(0.33)
	Non-participant in TEF	1.142	(1.20)	0.885	(1.15)	1.066	(0.58)	0.941	(0.58)	1.082	(0.75)	0.914	(0.85)
Week effects (Ref: Week 1)		YES		YES		YES		YES		YES		YES	
Wave (Ref: Wave 1)		YES		YES		YES		YES		YES		YES	
Field fixed effects		YES		YES		YES		YES		YES		YES	
N		1,537		1,537		1,537		1,542		1,542		1,542	
Log likelihood		-1855.1		-2142.9		-1913.6		-2324.7		-2183.2		-2301.5	

Notes: z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1. Odds ratios reported.

Table 5. Ordered Logit Estimates (odds ratios reported)- Dependent variables: Differing views of online teaching and assessment of differing ranks

		Reduces understanding		Enhances Planning		Increases Prepartion Time		More time consuming		Can lead to more considered feedback		Is more tiring	
		Coeff	zstat	Coeff	zstat	Coeff	zstat	Coeff	zstat	Coeff	zstat	Coeff	zstat
Teaching & Marking Experience	Experience in on-line activity (Professor)	0.589 **	(1.91)	2.297 ***	(2.85)	0.864	(0.49)	0.325 ***	(4.23)	3.854 ***	(4.98)	0.354 ***	(3.77)
	Experience in on-line activity (Associate Professor)	0.392 ***	(4.07)	1.883 ***	(2.84)	0.616 **	(2.08)	0.244 ***	(5.83)	2.637 ***	(4.19)	0.338 ***	(4.53)
	Experience in on-line activity (Lecturer)	0.499 ***	(3.17)	2.105 ***	(3.42)	0.771	(1.21)	0.164 ***	(7.25)	4.608 ***	(6.44)	0.260 ***	(5.48)
	Experience in on-line activity (Other)	0.386 ***	(2.97)	2.691 ***	(3.23)	0.479 **	(2.28)	0.177 ***	(4.50)	0.994	(0.02)	0.200 ***	(4.07)
	On-line due to pandemic	0.747	(1.28)	1.315	(1.17)	0.749	(1.26)	0.794 ***	(2.20)	1.261 **	(2.15)	0.764 ***	(2.55)
Work engagement	Dedication	1.067	(0.77)	1.142	(1.65)	0.993	(0.08)	0.933	(0.88)	1.062	(0.76)	0.916	(1.11)
	Vigour	0.658 ***	(6.36)	1.349 ***	(4.72)	0.836 **	(2.82)	0.868 **	(2.28)	1.073	(1.13)	0.805 **	(3.50)
	Absorption	1.069	(0.79)	1.035	(0.43)	1.035	(0.41)	1.081	(0.98)	1.013	(0.16)	1.161 *	(1.86)
Job insecurity	Insecure about job	1.183 ***	(3.73)	0.905 **	(2.30)	1.152 ***	(3.16)	1.168 ***	(3.53)	0.923 *	(1.82)	1.222 ***	(4.61)
	Confident about outside work options	0.945	(1.05)	1.119 **	(2.15)	0.966	(0.64)	0.973	(0.53)	0.949	(0.99)	0.974	(0.49)
Academic Rank (Ref. Teaching Intensive roles)	Professor	0.547 **	(2.49)	0.643 *	(1.90)	0.931	(0.29)	0.894	(0.25)	0.213 ***	(3.54)	0.968	(0.07)
	Associate Professor	0.654 *	(1.94)	0.780	(1.19)	0.819	(0.89)	0.969	(0.07)	0.257 **	(3.22)	0.887	(0.27)
	Lecturer	0.994	(0.03)	0.882	(0.60)	0.948	(0.24)	1.311	(0.63)	0.179 **	(4.11)	1.007	(0.02)
	Research Fellow/ Senior Research Fellow	0.563	(1.66)	0.671	(1.23)	0.887	(0.34)	1.231	(0.62)	0.597	(1.50)	0.992	(0.02)
	Other	0.782	(0.61)	0.466 *	(1.91)	0.620	(1.18)	1.038	(0.10)	0.379 *	(2.25)	1.265	(0.61)
Demographic	Gender	1.223 **	(2.33)	0.949	(0.61)	0.925	(0.85)	1.015	(0.16)	0.942	(0.70)	0.898	(1.29)
	Child under the age of 4	1.091	(0.62)	0.835	(1.43)	0.806	(1.59)	0.833	(1.42)	0.976	(0.19)	0.800 *	(1.75)
Non-teaching activities	Involvement in administrative activities	0.867 **	(2.47)	1.127 **	(2.14)	0.683 ***	(6.63)	0.805 **	(4.01)	1.017	(0.30)	0.726 ***	(5.83)
	Proportion of time devoted to research (%)	1.004	(1.50)	0.998	(0.98)	0.991 **	(3.39)	0.997	(1.29)	1.003	(1.42)	0.998	(0.77)
	Change in the prop of time devoted to child care (%)	1.004	(1.11)	0.996	(1.30)	1.005 *	(1.69)	1.000	(0.05)	1.003	(0.97)	1.002	(0.74)
Institutional environment	"New" universities	1.279	(1.58)	0.866	(0.96)	1.135	(0.82)	0.874	(0.89)	1.272	(1.56)	0.915	(0.58)
	Surplus of deficit of institution (% of total income)	1.011 *	(1.81)	1.003	(0.57)	1.000	(0.05)	0.992	(1.40)	0.996	(0.70)	0.993	(1.34)
	No. Post-Graduate Students (000s)	1.000	(1.45)	1.000	(0.03)	1.000	(0.23)	1.000 *	(1.90)	1.000 *	(1.75)	1.000 *	(1.95)
	Total Income (£000s)	1.000	(1.57)	1.000	(0.47)	1.000	(0.81)	1.000	(1.02)	1.000	(0.22)	1.000	(1.17)
	Teaching Excellent Framework (TEF)	0.913	(0.50)	1.251	(1.28)	1.168	(0.85)	0.938	(0.36)	1.295	(1.45)	1.058	(0.32)
	Non-participant in TEF	1.139	(1.18)	0.886	(1.14)	1.063	(0.55)	0.947	(0.52)	1.074	(0.68)	0.919	(0.81)
Week effects		YES		YES		YES		YES		YES		YES	
Wave (Ref. wave 1)		YES		YES		YES		YES		YES		YES	
Field fixed effects		YES		YES		YES		YES		YES		YES	
N		1,537		1,537		1,537		1,542		1,542		1,542	
Log likelihood		-1866.6		-2142.9		-1913.6		-2324.7		-2187.3		-2301.5	

Notes: z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1. Odds ratios reported.

Appendix

Appendix Table I. Summary statistics for additional variables

Gender	0.53	0.50	0	1
Child under the age of 4	0.14	0.40	0	4
Involvement in administrative activities	2.11	0.94	1	5
Proportion of time devoted to research (%)	26.30	24.03	0	100
Additional time devoted to child care (hours)	4.92	16.78	-115	163
"New" universities	0.62	0.51	0	1
Surplus of deficit of institution (% of total income)	-10.69	8.92	-27.5	10.6
No. Post-Graduate Students (000s)	5,371	16,738	345	472,915
Total Income (£000s)	461,307	420,039	34,764	2,450,136
Teaching Excellent Framework	2.01	0.95	1	3
Teaching Excellent Framework - None	0.31	0.46	0	1