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The Post-Pandemic Lecture: Views from Academic Staff across the UK

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Abstract: COVID-19 forced the closure of UK universities. One effect of this was a change in how lectures, and their recordings, were made and used. In this research, we aimed to address two related research questions. Firstly, we aimed to understand how UK universities replaced in-person lectures and, secondly, to establish what academic staff believed the post-pandemic lecture would look like. In a mixed-methods study, we collected anonymous quantitative and qualitative data from 87 academics at 36 UK institutions. Analysis revealed that respondents recognised the value and importance of interactive teaching and indicated that the post-pandemic lecture would and should make greater use of this. Data also revealed positive views of lecture capture, in contrast to pre-pandemic studies, and demonstrated that staff recognised their value for those who were unable to attend, or who had specific learning differences. However, staff also recognised the value of asynchronous lecture videos within a blended or flipped approach. This study provides evidence that the pandemic has engendered changes in attitudes and practices within UK higher education that are conducive to educational reform.

Keywords: COVID-19; lecturing; lecture capture; higher education; flipped teaching; blended learning

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1. Introduction

In March 2020, the World Health Organisation declared COVID-19 a pandemic and, subsequently, COVID has significantly impacted on all aspects of society worldwide, including higher education (HE) [1]. The pandemic resulted in many university campuses closing around the world and all teaching, learning and assessment transitioning online [2]. In the UK, universities were forced to pivot all teaching online in March 2020, with online teaching remaining in place for the remainder of the academic year (to September 2020). This sudden online transition can be seen as a rapid acceleration of a slower pace of change in this direction in pre-pandemic years [3]. Prior to the pandemic, most universities were moving towards blended learning, with face-to-face teaching supported by virtual learning environments (VLEs)/learning management systems (LMS) and tools such as lecture capture (LC) [4–7]. Previously, the pace of change had been slow and risk averse [8] but the pandemic forced academic staff and institutions to rapidly adopt approaches that were (for them) novel [9]. Despite the exceptional circumstances in which changes have arisen, it is highly probable that many universities will continue with their new online modes of teaching long-term with a recent report based on the views of over 1000 sector leaders, staff and students indicating that the future of universities was blended delivery [10].

One teaching method engrained within universities is the lecture, which provides an efficient way to teach large numbers of students [11]. Previous research shows that students value lectures highly as a means of providing core knowledge [7,12] but they can also support development of independent thinking and problem solving [13]. Although the common approach to lecturing prior to COVID-19 was to lecture live and in person,

recording of live lectures through LC was common pre-pandemic, with recordings typically made available via VLEs soon after the live event [14–16]. Research shows that students feel that the availability of capture supports their well-being [12]; and for those with disabilities, it can be extremely helpful [7]. However, the use of LC is contentious, especially where students utilise it in place of attendance [17]. Furthermore, staff have expressed significant concerns about LC, including that it reinforces an acquisition-transfer model of learning, which is unlikely to result in deep learning, and can inhibit the use of anecdotes and controversial material, which may support learning [12]. Staff have also expressed concern that the availability of video recordings of lectures may negatively impact their intellectual property, performance reviews and autonomy, ultimately affecting job security [18].

Although use of video recordings of lectures was controversial prior to the pandemic, the COVID-19 shift to online learning has meant that pre-recorded lectures have become the new normal for many. Subsequently there has been a shift in the narrative around lectures and the use of video, such that questions are now being asked about whether conventional live lectures will return. Within this debate, we may see greater acceptance of video media and greater reliance and acceptance of LC by staff, who have previously shown some resistance [18]. Furthermore, the flexibility of lecture capture is likely to be more widely recognised by both staff and students now that both have been forced to work and study in sub-optimal conditions. In the current study, we aimed to understand staff perceptions of what the post-pandemic lecture would and should look like in UK universities. By focusing on academic staff directly involved in teaching, we are focusing on a group who have been previously identified as critical in the success of pedagogical reform [19] and who will be directly affected by changes in how lecturers are delivered. The current study aimed to address the following key questions: (i) How were in-class lectures replaced during the emergency online pivot? (ii) Has the pandemic has changed attitudes towards LC? (iii) Will staff return to conventional lecturing, and what might future lectures look like in post-pandemic education? (iv) What role will lecture capture technology play in future lectures?

2. Materials and Methods

2.1. Study Design

This study adopted a mixed-methods methodology with a concurrent design such that both quantitative and qualitative data were collected simultaneously. This approach allowed us to obtain broad trend data on how lectures were replaced and whether views of pedagogy and technology had changed but also obtain the detail of qualitative research to examine beliefs of staff and therefore yield greater insights than either method alone [20]. All data were collected via an anonymous online survey.

2.2. Researcher Positionality

All authors of this work have been actively using and evaluating education technology for several years. The second and third authors (BG, EJD) have been conducting research focusing on lecture capture and video tools for over five years, investigating staff and student attitudes to lectures and their capture both from a teaching and learning perspective and a policy point of view. All authors taught throughout the pandemic, across three universities collectively. In conducting this research, the authors wanted to better understand how to COVID-19 had impacted lecture-based teaching and the views of lecturers specifically regarding the use of lecture capture.

2.3. Survey Distribution

The survey was advertised using several methods to recruit academics across UK universities. Adverts were placed on social media, in institutional research circulars, via the Higher Education Academy Principal Fellows network and HE Advance website. The survey ran from 16th March 2021 to 19th April 2021. Ethical approval was granted by the corresponding author's Institutional Research Ethics Committee (MRA-20/21-22320).

2.4. Survey Structure and Procedure

Participants were provided with study information and gave consent online, prior to gaining access to the survey. The survey consisted of three sections.

Section 1: collected demographic information (age, gender, ethnicity and disability) using a pre-determined list of options.

Section 2: focussed on teaching experience, utilising a series of closed questions relating to their current position (duration in role, full time equivalency, focus of role, proportion spent teaching, discipline and level of teaching). Participants also had the option of including the name of the university they worked for.

Participants were then asked to indicate if they had previous experience of LC, followed by rating agreement (1 = strongly disagree, 7 = strong agree) with several attitudinal measures towards LC aimed at both instrumental (good/bad) and experiential (pleasant/unpleasant) aspects of attitude [21]. Finally, participants were asked to indicate if their attitude towards LC had changed since the pandemic. If they responded that it had, they were asked to provide an open-text explanation.

Section 3: participants indicated how their in-person lectures were replaced from a pre-determined list (synchronous with technologies like Zoom; pre-recorded asynchronous using non-LC technology, pre-recorded asynchronous using LC technology; synchronous using LC technology), with the option of adding an unlisted alternative. Where participants indicated synchronous lecturing was used, they were asked if they used anything to introduce interactivity, with a free-text answer format. For participants answering this question there was a follow-up question asking why they adopted this approach and whether they felt it was effective. All participants were asked whether they ran additional online activities to support learning of lecture materials. This was again followed up with a question about rationale and effectiveness.

All participants were then asked whether they foresaw a return to conventional lecturing when public health and government guidance permitted this (Yes, No, Maybe, I don't know), and asked to explain their answer. Participants where then asked what they imagined the post-pandemic lecture will look like and what they would ideally like it to be. They were then asked if they felt LC technology would play a role in the post-pandemic lecture and what features these technologies would need to do so.

2.5. Data Analysis

Quantitative data: Data collected regarding demographic characteristics and teaching experience were analysed using descriptive statistics (i.e., frequencies), to characterise the sample. Similarly, some of the data collected to identify the teaching methods adopted during the pandemic were analysed in terms of frequencies. Additionally, free-text responses regarding techniques used for interactivity and activities were inductively categorised and category frequencies were reported. Eight questions regarding attitudes towards LC were grouped according to the underlying construct. The four items assessing instrumental attitudes were averaged to create a single measure (Cronbach's alpha = 0.852). The same approach was taken with experiential attitude (Cronbach's alpha = 0.852). For these measures a rating of 4 represented the midpoint (neither agreement or disagreement) and they were analysed with a one-sample Wilcoxon tests to assess whether the distribution of responses was significantly different to that midpoint of '4', with standardised Z values reported.

Qualitative data: Free-text responses to open questions were typically brief, precluding the emergence of rich themes [22,23]. Instead, data were analysed using open coding procedures to identify and describe discrete instances within the data, a procedure is common to many qualitative methodologies [22,24,25]. This strategy was sufficient to summarise the core concepts within the qualitative data, and to meet the aims of the qualitative analysis, i.e., to complement and enrich understanding of the quantitative analysis. Quotes are provided to illustrate concepts throughout [26]. Qualitative analysis was initially completed by two of the authors independently (LR, EJD) who identified core concepts. Following independent identification, codes were shared, discussed, refined

and consolidated to provide a final list of concepts. The final list of concepts and their description was then verified by the third author (BG), a senior qualitative analyst.

3. Results

3.1. Participant Demographics and Teaching Experience

The sampling approach taken precludes response rate calculations. Of the 143 participants starting the survey, 88 (62%) completed it. Of these, one was excluded because they were based outside of the UK, leaving a final sample of 87 (Table 1). Sixty participants opted to identify their university, with academics from 36 UK universities representing Oxbridge, the Russell Group and Post-92 universities participating.

Table 1. Staff demographic characteristics where total N and % reflect number answering question. [a] 17 categories were consolidated into three; [b] no participant reported a sensory impairment.

Characteristic	N	%
Gender		
Male	54	63.5
Female	28	32.9
Other/Prefer not to say	3	3.6
Age (years)		
21–30	7	8.2
31–40	33	38.9
41–50	21	24.7
51–60	21	24.7
61+	3	3.5
Ethnicity [a]		
White British	64	75.3
White Other	13	15.3
BAME	6	7.1
Other/Prefer not to say	2	2.4
Disability [b]		
Physical disability	10	11.4
Learning difference	5	5.7
Mental health condition	10	11.4
Long-term condition	5	5.7
None	58	66.7
Prefer not to say	1	1.1

Within the surveyed population, most were working full time (n = 66, 77.6%), with only approximately one-fifth part time (n = 19, 22.4%), and two not reporting employment status. Of those in part time employment, most were working 0.6 FTE (n = 6, 31.6%), although the range of employment was wide at 0.1–0.8 FTE. Most participants were in dual teaching and research positions (n = 38, 45.2%), closely followed by those focusing on teaching (n = 34, 40.5%). Only three (3.6%) were in research-focused roles. A further nine participants (10.7%) stated that their role focused on other areas, with free-text answers indicating a range of activities including teaching development, management and dual clinical—academic roles, often combined with teaching. Most participants were teaching undergraduates (n = 61, 72.6%) rather than postgraduates (n = 23, 27.4%), with three not specifying (Table 2). Finally, of those participating, most had previously used LC (n = 60, 74.1%), in comparison to 21 (25.9%) who had not, with six not disclosing this information.

Table 2. Teaching experience of participants where total N and % reflect number answering question.

	N	%
Teaching experience (years)		
<2	8	9.4
2–5	19	22.4
6–10	19	22.4
11–15	10	11.8
16–20	9	10.6
21–25	12	14.1
25+	8	9.4
Discipline		
Science and maths	33	39.3
Clinical based	15	17.9
Arts and humanities	13	15.5
Social science	20	23.8
Engineering	3	3.6
Teaching proportion (last 2 years)		
1–20%	15	17.9
21–40%	20	23.8
41–60%	21	25.0
61–80%	14	16.7
81–100%	14	16.7

3.2. Approaches to Replacing the Face-to-Face Lecture

To gain insight into how staff replaced lectures, we examined the specific approach they took, their reasoning behind this and what they thought about the effectiveness of their approach, both whether it was effective and what determined this. Additionally, we considered what interactivity they used within synchronous online lectures and any other activities they used to support lecture-based learning.

3.2.1. Methods of Online Lecturing

Table 3 shows the approaches used to replace lectures. Although 8 (9.2%) participants did not provide any details of replacement approaches, of those that did most reported using multiple methods (57.5%); 37 (42.5%) used two approaches, 7 (8%) used three approaches and 6 (6.9%) used all four listed approaches. Additionally, 13 (14.9%) selected 'other', with free-text answers suggesting that most combined the listed options (e.g., recording in PowerPoint and uploading via LC technology or recording audio-only lectures). Only one participant detailed using written learning rather than multimedia, indicating that almost all made use of visual or audio media.

Table 3. Lecture replacement methods.

	Number	%
Synchronous lecturing using non-LC technologies, e.g., Zoom	63	72.4
Synchronous lecturing using LC technologies, e.g., Echo360	11	12.6
Asynchronous lecturing using non-LC technologies, e.g., Kaltura	43	49.4
Asynchronous lecturing using LC technologies, e.g., Echo360	31	35.6

3.2.2. Interactivity in Online Live Lectures

Of the 74 academics using synchronous methods, 52 answered the follow-up question about how they introduced interactivity into online lectures. Answers consisted of statements specifying an approach, for example "questioning techniques" (P8) or specifying a technology, such as "questions via Poll Everywhere, mini quizzes via zoom polls" (P2) and therefore responses were categorised into different techniques. Fifty of the responses could be categorised as at least one of: Polling/questioning (n = 34; 68%); Discussion (n = 32; 64%); Breakout activities (n = 25, 50%); Collaborative activities (e.g., sharing and

co-producing documents, n = 8, 16%). Most staff (64%) reported using more than one method. Of the two that could not be categorised, one did not provide a response and the one said no interactivity was possible.

Qualitative analysis of the rationale provided for the interactivity approach taken revealed that staff chose based on what they felt they needed to achieve in their teaching and five core needs were identified, three of which related to pedagogy. Firstly, and most reported was the need to promote active learning and interaction ("Interactive teaching keeps students engaged and seems to increase their understanding" P38). When explaining this, staff expressed views relating to teaching ideals ("Any synchronous time with students should be more than didactic" P18) and student expectations ("the students really wanted interactions" P18). Secondly, staff noted a need to replicate face-to-face approaches ("I moved to a more interactive synchronous style that is more typical of the model I used pre-pandemic" P27). Thirdly, staff wanted to have a means of assessing students' understanding ("[To] see how understanding was with the students, as can't see students faces" P57). The remaining two needs identified were the need to create a sense of belonging for the students (I wanted them to have a sense of being in a group." P6) and, finally, taking a 'needs must' approach. The latter could be divided into (i) available tools ("we had to make do with what was available at short notice to get on with the semester" P24) and (ii) staff abilities ("It was the only way I could see", P26).

Comments about whether their chosen approach was effective were limited, with most indicating that effects were mixed, "sometimes it worked, but not always" (P16). Further analysis therefore focused on the reasons staff gave for effectiveness. Within this context, two key reasons were identified by staff when explaining effectiveness of interactive approaches: student engagement and familiarity/transferability. In terms of student engagement, staff reported that students were not always willing to engage with interactive activities ("a significant proportion of students would not engage", P16). In addition to willingness, there were technical barriers to student engagement that prevented approaches being effective (e.g., "issues related to digital poverty and/or connectivity issues did prove problematic to some students" P24). Staff reported that engagement could be increased by allowing anonymity ("giving them an option to give an anonymous answer encouraged participation", P40). Large group sizes were noted as challenging for many with "very few students want to talk in large zoom calls" (P4), whilst smaller groups supported better engagement ("I think the students found the small group discussions helpful" P86). Familiarity and transferability were noted to impact on perceived effectiveness, in that where a technique for interaction had been used pre-pandemic and transferred well to the online context, this was perceived as more likely to be effective ("this session transferred brilliantly from the face-to-face in person session I used to do to [online]" P43). However, it was also noted that where something was not initially considered effective, more familiarity could increase perceived effectiveness ("It was moderately effective, although I think it could become more effective if we worked to accustom students more to that way of operating." P85).

3.2.3. Additional Online Activities Supporting Lecture-Based Learning Online

As well as interactivity during synchronous lectures, staff were asked about additional online activities they had used to support learning of lecture materials. Fifty-three staff answered this question, and the most used activities were quizzes within the VLE and opportunities for discussion, either formal or informal. A full summary is provided in Table 4. When questioned about the rationale for their choice of online activities, coding analysis revealed very similar responses to those given for interactivity. Firstly, many staff reported a need to ensure active learning ("This prevented the overall online learning experience from being too passive" P81) and to support interactivity ("[I wanted to] encourage direct student to student contact." P14). Secondly, staff reported attempting to replicate pre-pandemic face-to-face teaching ("Questions embedded within lectures to replace questions in F2F lectures" P10). Additionally, they also chose activities to create

a sense of belonging ("to keep cohorts' identity there—sense of belonging" P25). An additional code that emerged when considering online activities but not interactivity was simply to help learning ("it helped to address any questions and clarify if anything was not clear" P53). Staff also noted a need for variety in the learning ("give them multiple ways to engage with course material" P80). For effectiveness, the few staff who provided details noted that it varied considerably, as was the case for lecture interactivity. They typically reported that for the students who had accessed additional activities they had been helpful, but many did not engage ("The discussion boards and live Q&A sessions have been effective for some students, but it is a core of students who use them, encouraging all to interact has been very difficult" P10). Variation was driven by a range of factors including whether students had "discovered" the additional activities and the specific cohorts involved ("The same type of session received different responses depending on cohort/topic and what students felt was effective varied." P42). Some staff felt that for effort taken, engagement had been disappointing ("so it was a bit disappointing for the amount of effort it took" P37).

Table 4. Additional activities used to support learning of lecture material.

Additional Activity	Example	N (%)
Tests of knowledge	"Quiz activities in VLE" (P27)	19 (36)
Discussions	"I set up a regular 'virtual water cooler' at the same time [each day], for students and staff alike to 'bump into me' for a chat about anything, as if they had called by my office or bumped into me on campus." (P19)	14 (26)
Opportunities for students to ask questions	"We ran numerous Q&A sessions, and provided padlet for anonymous questions" (P20)	8 (15)
Drop-in sessions	"Extra 'office hours' type sessions on Zoom." (P39)	6 (11)
Other forms of teaching	"I recorded additional equipment demonstrations on YouTube for students with further curiosity" (P45)	6 (11)
Group work	"divided students into pre set groups for some activities" (P79)	3 (6)
Engagement checks	"Each 'lecture' then completed with an online quiz. Engagement with quizzes monitored and students emails red-amber-green individualised emails" (P61)	2 (4)
Non-academic support	"Started a departmental podcast to allow the students to get to know us better." (P37)	2 (4)
Extra communications	"Use Slack workspace for daily random communications and courtesy reminders" (P67)	1 (2)
Extra resources	"Also gave links to YouTube videos to support teaching." (P38)	1 (2)

3.3. Attitudes to Lecture Capture

Both instrumental and experiential attitudes to LC were assessed and compared to a hypothetical midpoint as detailed in the Section 2.5. Results from one-sample Wilcoxon tests are shown demonstrate that both instrumental (M = 5.45, SD = 1.27, Z = 6.802, $p < 0.001$) and experiential (M = 4.84, SD = 1.25, Z = 5.077, $p < 0.001$) attitudes were significantly different from the hypothetical mid-point. In all cases, the responses indicated a positive attitude towards LC, although arguably these were more positive for instrumental attitudes.

Although most participants indicated that their attitude to LC had not changed (N = 48, 57.8%) since the pandemic, approximately two-fifths (n = 35, 42.2%) reported a change. Four declined to answer. Thirty-two of those who indicated that their attitude had changed provided a free-text explanation. Analysis of the responses revealed five codes, or reasons for the attitude change. Firstly, and the most cited, was that staff now perceived there to be a 'greater value' to captured or recorded lectures. The explanations for the greater value could be divided into three distinct areas: Inclusivity ("Previously they seemed inconvenient now however, it would be essential to provide the learning if a student is unable to come to a lecture because of illness" P70); Blended/Flipped ("reinforced

the need to blend teaching to create better learning experiences and online recordings are indeed important to this whole learning solution" P22) and Chunking ("Having used shorter, more focussed videos for the past year, I find these a much better way to communicate the necessary information." P81). Secondly, there was sense of 'digital positivity' identified which indicated that attitudes to lecture capture had become more positive because of a general increase in positive attitude to all digital tools rather than specifically towards LC ("I'm more positive about digital opportunities in general" P21). Thirdly staff also recognised a 'general acceptance' of LC use ("I have come to accept videoed lectures more so a more positive view" P14). Arguably more specific to LC were the final two reasons of familiarity and production quality. Staff indicated that they had become more familiar with the functions available within LC and this had changed their views ("I have had to learn how to use it properly, now knowing all the features has changed my outlook" P69). At the same time, recognising that the production quality did not have to be perfect was another factor in attitude change ("I have realised that recordings don't need to exhibit Hollywood/"Royal Institution Christmas Lecture" production values" P34).

3.4. The Future of the Lecture

Staff were asked about how they expected the lecture to be in future. However, because these expectations may be underpinned, at least in part, by what their university has communicated and may not fully represent what they would like the lecture to look like, they were also asked about their ideal lecture.

3.4.1. Expectations of the Future Lecture

Of the 73 (88%) participants who responded to the question about whether they expected a return to conventional lecturing when government and public health guidance allows, responses were relatively evenly split with 28 (38.4%) believing we would return to conventional lectures in contrast to 23 (31.5%) who did not believe we would. The remaining 22 (30.1%) were unsure. Open coding of the expectations of the future lecture identified into four categories of expectation: returning to the pre-pandemic lecture; changes to face-to-face lecturing; retaining online components and greater use of blended learning. Within each of these, several specific ideas were expressed. Reasons for returning to the pre-pandemic lecture tended to focus on practical elements such as the need to teach large numbers of students in a cost-effective way ("Better value, [you can] fit money for students [in]" P28) and the requirement for staff to be able to redress workload inequalities that had arisen due to the extensive teaching workload detracting from research activities during COVID ("I think that will happen because everyone is exhausted, and behind with their research, and it will be the only way to cope with meeting the demands of teaching and researching." P58).

In contrast, those suggesting that there would be changes to face-to-face lectures commented more on learning experiences, identifying a need for interactivity and active learning ("the massive upskilling and reflection will result in more considered lecturing, more interaction, more active learning during lectures" P21). Staff also noted that smaller chunks of lectures would be used rather than 1–2 h of lecturing ("traditional long lectures will be split into shorter 15–20 sections, with mini-breaks" P16). Although some staff noted that lecture capture technology was in place prior to the pandemic at their institution, this was not universally the case and therefore, some noted that this would become used as standard. The main reason for this was that the technology was now available, having been brought in as a response to COVID-19 at a significant cost to the university and, therefore, must be used ("All our teaching rooms now have moving cameras that capture mobility of lecturer—and this has cost the university significant money—I find it hard to believe that we will not be expected to use this tech next year" P45).

As well as changes to face-to-face lectures, staff also felt that some aspects of online teaching in place of lectures would be retained post-pandemic. The most retained component was the use of pre-recorded lectures, although not necessarily to replace the

entire lecture experience but more didactic components and to be completed at specific times ("Lectures will be online as shorter videos that students will be expected to watch within a certain timeframe" P61). Asynchronous support around lecture learning was also considered an element to keep ("I expect to continue the asynchronous supporting activities." P10). The key reason given for retaining some elements of online learning was cost-effectiveness. As with the pre-recorded videos, these activities had taken so long to produce staff felt they needed to use them for more than one year ("stick with our 'emergency' mode with recorded material and the structure of this because it already exists and time is pressed" P40).

The final expectation was greater use of blended learning. Within this, many staff mentioned flipped learning by name, whilst others simply described a flipped approach of students viewing lecture videos or other resources in advance and coming onto campus for more interactive sessions ("I will probably ask students to watch short videos before coming to lectures and then do exercises and other interactive activities with them in the class itself." P84) [27]. The second idea within this was that blended learning allowed greater flexibility for students ("I think there will be a blend of both 'conventional' lecturing and online learning. I think this will allow learning to be more flexible for students." P54).

3.4.2. Ideal Views of the Future Lecture

Analysis of responses about the ideal lecture revealed the same four categories as the expected lecture. Most commonly staff reported a desire to adopt a blended approach, with many willing to have the interactive sessions online or in-person, or both suggesting flexibility: "Higher quality asynchronous mini lectures, supported with small-group focussed live workshops (mix of face-to-face or virtual in a single space)" (P32). Within the overall topic of blended, staff frequently mentioned flipped approaches specifically "I like the idea of shorter videos for students and then class time being used to check understanding and discuss any confusing points (flipped classroom)" (P34). Staff also expressed a desire to retain online components "Lectures should remain online, seminars and workshops should be in person" (P24). Where staff wanted to see face-to-face lecturing return, they did so with notable changes, as for the expected lecture analyses, with greater interactivity and active learning "more interactive, will probably still keep polls and whiteboards in" (P31). Similarly, they also referred to changes around technology, for example "It would be a slightly enhanced version of the pre-pandemic lecture, with enhanced graphics/animation/use of videoclips, and probably more clearly structured. It would be captured and made available to the students on the module" (P16). Relatively few staff expressed a desire to return to the pre-pandemic lecture and where they did, they cited a need for 'in the room' engagement: "I think ideally lectures take place in real time with the lecturer and students in the same room. In short: for energy, enthusiasm, pacing, concentration, enjoyment, etc." (P37).

3.5. The Role of Technology in the Post-Pandemic Lecture

Analysis of staff responses about what role LC technology would play in the future identified three possible roles: recording of synchronous lectures; recording of asynchronous lectures; no role for capture technology. The most cited use was recording of synchronous lectures, within which three core ideas were expressed. Firstly, staff noted that the recording of synchronous lectures would support learning by allowing students to replay and revise the lecture ("Act as a revision aid and a chance for students to 'replay' parts which they want more clarification on." P10). Secondly, it was noted that recording these would allow students to view lectures they could not attend ("Lecture capture will be critical for including students who could not be there on the day for whatever reason." (P65)). Finally, it was noted that these recordings supported more flexible and inclusive learning with specific learning difficulties and first language differences mentioned ("For those with an SpLD or who do not have English as their first language to revisit the lecture and fill in gaps they missed during live teaching." P21).The use of LC to record asynchronous lectures was typically in relation to flipped teaching approaches ("I would like to

use the system to record shorter videos for the students, and then use class time differently." P34). The most infrequently cited code was that there would be no role for lecture capture technology and within this, three key ideas emerged. Firstly, personal choice, with staff indicating that use would be determined by individual staff members ("I'm not sure that lecturers will use lecture capture." P39). Secondly, staff noted that LC technology would not be as useful for recording live events because lectures had become more interactive since the pandemic ("I think it might play a more minor role than it has previously because my large-group sessions are likely to be interactive and hence less susceptible to lecture capture." P84). Finally, staff noted that standard LC technologies may be replaced by alternative technologies which are easier to use for editing, for example ("Redundant. Will use something like kaltura" P34), suggesting recording would take place but just not using LC technologies.

The follow-up question regarding what features LC would need to support student learning if it were to be used in future, yielded a range of responses. These could be divided into two areas; those that directly supported student learning and those that provided indirect support by giving functionality to staff, which in turn make lecture capture more helpful for students. Each of these could be further subdivided as summarised in Figure 1, which also provides a summary of the rationale for each specific technology requirement. The most cited technology was the need for captioning which was driven by the desire to create inclusive and accessible learning but also legal requirements. Interactivity tools were also frequently mentioned with suggestions of quizzes, discussion or chat options. The rationale for interactivity fell into two areas; a desire to assess what students were understanding and a need to create an engaging, community building learning experience. Staff also wanted to see lecture capture technologies have multiple inputs rather than just slides, audio and video of the lecturer. They felt that this allowed a better capture of their teaching which may include ad hoc use of visualisers or whiteboards to respond to the classroom environment. Finally, the existing functionality of replaying and revisiting capture was noted to be important for students. In terms of indirect learning support, staff felt analytics data from the lecture capture system could allow them to better understand what areas students may need extra help with and so to improve on teaching. Additionally, they noted that an easy to edit interface would be beneficial because they could create more effective resources efficiently and have a clear understanding of the student view.

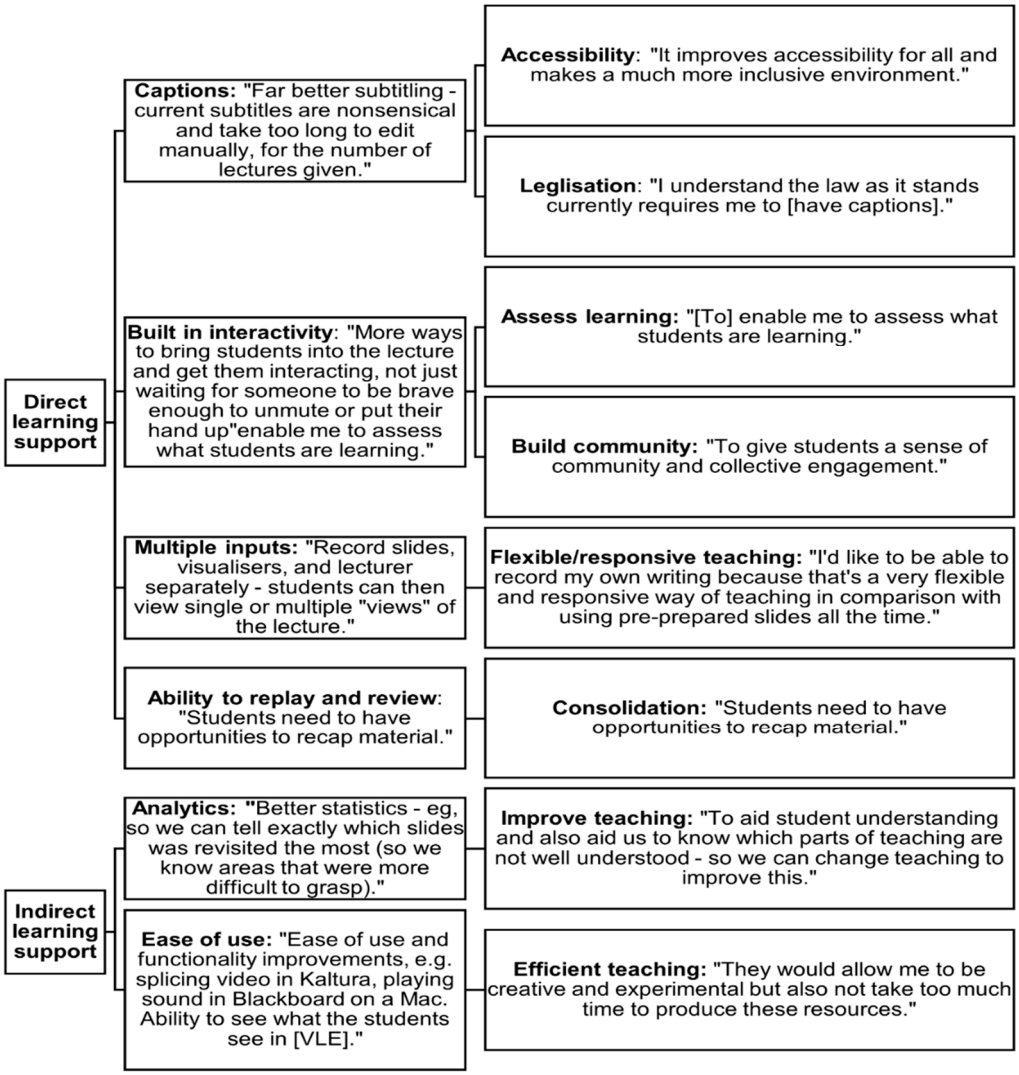

Figure 1. Staff requests for specific features in lecture capture technology.

4. Discussion

In the current study, we aimed to, firstly, understand how UK university staff had replaced their face-to-face lectures during the emergency pivot online, and secondly, ascertain their perceptions of what the post-pandemic lecture would and should look like with reference to both pedagogy and technology.

4.1. How Were in-Class Lectures Replaced during the Emergency Online Pivot?

In terms of understanding how staff had replaced lectures during the online pivot, we found that most staff replaced lectures with multiple methods utilising a range of media and offered both synchronous and asynchronous activities. This use of multiple methods is likely to reflect not only the choice of the academic, but also specific institutional policy. Previous research in this area is understandably limited due to the context of the pandemic but research from outside of the UK, in Spain, reveals little diversity of the methods for online teaching [28], suggesting that the findings here may not be reflected in other countries. Irrespective of this, it is clear that most staff in the current study recognised the value of using a range of approaches to delivery teaching online. Where staff used synchronous teaching, most employed several interactive activities such as polls and discussions. Choice of activities was largely driven by a desire to ensure active learning with interaction, replicate face-to-face teaching, create a sense of belonging and test student understanding. Reflections on the effectiveness of approaches taken indicated that no one

size fits all, with student engagement and familiarity impacting on effectiveness. Similar approaches and reasoning were found for activities used to support lecture-based learning outside of synchronous sessions.

4.2. Will Staff Return to Conventional Lecturing, and What Might Future Lectures Look Like in Post-Pandemic Education?

Staff expectations of post-pandemic lectures suggested that the majority felt that they would not return to conventional lecturing. Instead, lectures would typically become more interactive. This is likely be to a popular approach for students; research conducted during the pandemic indicates that greater interactions between staff and students is welcomed by students because the amount of interaction is directly correlated with students perceptions of the quality of online teaching [29]. They also expected retention of some online components and to make more use of blended learning, with flipped learning frequently mentioned. Underpinning most expectations was a need for active learning and interaction as well as making effective use of class time. Where staff expected a return to the pre-pandemic lecture, it was notable that the reasons given were not pedagogic but related to cost effectiveness and workload. Importantly, staff views of the ideal lecture were similar to the expected lecture, suggesting that universities may move in the direction many staff would like. The desires of staff to utilise active learning are in line with the general trajectory of teaching approaches in recent years prior to the pandemic [30]. Furthermore, efforts to introduce active learning in lecture settings have met with mixed responses from students [31] meaning flipped or blended approaches may be preferable.

Greater use of blended learning could yield several benefits; it has been shown to improve retention, engagement [32–34] and attainment [35,36] and may enhance widening participation [37]. Flipped learning in particular has been found to be associated with better student performance than traditional approaches [38] and students show positive motivations towards the method [39]. Furthermore, some of the previously noted barriers to active learning approaches have likely been reduced by the pandemic. For example, concerns about students being able to work effectively with the online materials [40,41] will likely diminish because students have now experienced remote online learning, either at school or university. Moreover, from a staff perspective, previous barriers included lack of time, training and incentive to reform [30]. Whilst these have not been completely removed by the pandemic, many resources have already been created and staff upskilled as part of the emergency transition, which served as a rapid, albeit forced rather than incentivised, education reform. Indeed, research has shown that staff increased their use of professional development centred on online learning during the pandemic demonstrating a level of up-skilling, although further support is needed [42]. Research also shows that universities do not need to invest in repurposing spaces because active learning can be facilitated effectively in lecture spaces [43]. Finally, COVID-19 is likely to remain a public health concern [44] meaning blended learning may be the most pragmatic approach for the short term [45].

4.3. Has the Pandemic Has Changed Attitudes towards LC?

The staff completing the survey showed positive attitudes to LC, in contrast to previous research [12], and almost half noted that their attitude had become more positive since the pandemic. Most reported now seeing the benefits of the technology, specifically noting that it can support more inclusive learning, blended or flipped learning and chunking of lecture material. Greater acceptance and familiarity of the technology because of teaching online during the pandemic appeared to have contributed to attitude change. Staff also felt that they could produce videos of a sufficient quality. Finally, there was a general digital positivity which impacted on LC attitudes. When asked specifically about the role LC would play in future, most foresaw a role for recording synchronous lectures for students to revisit material or catch up on missed lectures as well as offering support for students with specific learning requirements, in line with previous research [12]. However, in addition

to this, staff also noted that it could be valuable in recording material for asynchronous delivery within a flipped learning approach. Some did not see a role of LC either through personal choice, because lectures would become too interactive to be recorded or because other technologies were more suitable for recording asynchronous video content. A link between active learning approaches and attitudes towards LC has been reported previously in a study which found appreciation of active learning approaches predicted positive attitudes towards LC [46]. The previous study was correlational and therefore, direction of causality could not be confirmed, only estimated. However, in the present study staff reported that their attitude towards LC became more positive because it offered options for active learning and blended learning, suggesting that the pedagogic approach drives the use of technology. This aligns with the common dictate that pedagogy must come before technology, despite arguments that the two have a more complex interaction [47].

4.4. What Role Will Lecture Capture Technology Play in Future Lectures?

Staff identified several features of LC that would be useful to directly support learning including captioning, interactivity, multiple inputs and the function of replaying. They also noted functions that would indirectly support better learning including analytics and an easy to use interface that would allow simply and quick editing. As might be expected, given the emphasis on active learning in previous responses, the rationale for these centred on active, student-centred learning that allowed staff to assess student learning to improve teaching and provide an inclusive, accessible resource. Prior to the pandemic the rationale behind capture was rarely stated but inclusivity was seen as a key driver [48–50]. Additionally, the functions noted by staff here have some precedent in research. For example, the replay feature is commonly used by students [51–54]. The use of captioning, whilst newer, is also gaining importance. This is partly driven by recent legislation about accessibility of websites, including LC videos on VLEs in the UK and Europe [55] but also by theoretical approaches, such as the Cognitive Theory of Multimedia Learning (Mayer, 2014). This theory assumes that (i) people have separate channels for processing visual and verbal information, (ii) people have a limited capacity in working memory for each of these channels, and (iii) we must actively process information for meaningful to learning to occur. The theory proposes that captioned lectures (whether live or pre-recorded) can provide a dual-channel approach to processing, with the spoken word (verbal) and caption (visual) operating together.

4.5. Limitations of the Current Study

The current study has identified the direction of travel that academics expect and want to see post-pandemic, with a move away from didactic lectures to flipped and blended approaches, supported with technologies facilitating interactivity and inclusivity. However, limitations of this study must be acknowledged. Firstly, the sample size was relatively small, although broad and therefore arguably generalisable. The small sample size overall meant that subgroup analysis, for example by academic discipline or teaching experience was not viable. Although this would arguably have been very interesting, it does not negate the current findings because the pandemic affected all staff irrespective of individual characteristics. Secondly, the use of a mixed-methods approach within a survey limited the richness of qualitative data, in contrast to, for example, semi-structured interviews. However, the context in which the data were collected meant that surveying data was likely to be most convenient to the targeted staff who had seen an unprecedented increase in workload meaning time-consuming interviews would be hard to schedule. Furthermore, the anonymity encouraged more honest views of the controversial period in higher education. Thirdly, the survey instruments used had not previously been validated. This is unsurprising given the unprecedented circumstances of the research but nonetheless can be viewed as a limitation. Finally, this study focused on the immediate period after the emergency transition and therefore it is possible that longer-term effects may differ from

those reported here. However, capturing this information still provides a vital insight into the impact of the pandemic on HE in the UK.

5. Conclusions

This study set out to, firstly, examine how UK academic staff had replaced in-person lectures during the pandemic and, secondly, establish what they expected and wanted the post-pandemic lecture to be like. The research offers a unique insight into staff views of the future of the lecture after one of the most turbulent times in higher education. In response to our first aim, we demonstrated that staff used a diversity of methods to replace the lecture, including synchronous and asynchronous learning activities, both typically supported by interactive components. The approaches taken were underpinned by a range of factors including a desire to foster active learning, test student understanding and instil a sense of belonging in the students studying remotely.

In addressing our second aim, we demonstrate that there is little appetite for a return to the didactic lecture that has become so engrained in HE [11]. There is a clear desire to move to blended learning making use of pre-recorded lectures and suitable technologies to interact and engage students in addition to active learning in face-to-face teaching. Flipped learning, a method students respond well to [38,39], was commonly referred to as an area of future travel. Interestingly, for most staff, their views of what the future lecture should and would look like aligned suggesting that they felt comfortable with the direction universities would take, although practical constrains such as time and workload were also noted. Furthermore, acceptance of technologies and, in particular LC, which has previously been controversial, has increased [7,12,18]. These results suggest that the significant impact COVID is reported to have had on HE [1] is unlikely to end with the pandemic and rather this has kick-started a long overdue educational reform, at least with regard to lectures.

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