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Post-Pandemic Learning Technology Developments in UK Higher Education: What Does the UCISA Evidence Tell Us?

Richard Walker ^{1,*}  and Julie Voce ² 
¹ Digital Education Team, Library, Archives & Learning Services, University of York, York YO10 5DD, UK

² Digital Education, Learning Enhancement and Development, City, University of London, London EC1V 0HB, UK; julie.voce@city.ac.uk

* Correspondence: richard.walker@york.ac.uk

Abstract: This paper explores the impact of the COVID-19 pandemic on learning technology developments within UK higher education, informed by the perspectives of the institutional Heads of E-Learning. Using a mixed-methods research design, drawing on Universities and Colleges Information Systems Association (UCISA) technology-enhanced learning (TEL) survey data (2018–2022) and panel discussions with institutional Heads of E-Learning, the paper discusses the key changes arising from the pandemic and the likely long-term impact they will have on technology adoption and usage within UK higher education. The UCISA data highlight an increased level of investment in TEL services in the period from 2020 to 2022, with UK higher education institutions supporting an extended core set of centrally managed tools. Interview data indicate that advances in technology provision and staff support are being used to help deliver more flexible and inclusive learning designs. However, the carrying forward of innovative practices from the emergency remote-teaching phase is far from certain, and contingent on instructional competencies (capability) and the capacity of teaching staff to support these developments. We conclude that institutions will need to commit to offering incentives and ongoing professional development to their teaching staff to support sustained innovation in their teaching and course delivery methods.

Keywords: emergency remote teaching; COVID-19 pandemic; digital pedagogy; educational technology; blended learning



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1. Introduction

In the emerging body of literature on the impact of COVID-19, the pandemic has been portrayed as a ‘pivot’ point for online learning [1–3], accelerating the adoption of learning technologies to support new modes of course delivery within the higher education (HE) sector. This has become the accepted interpretation of recent events, but what evidence is there to support this view? To what extent will the emergency remote teaching (ERT) phase lead to sustainable changes in the way that tertiary courses are designed and delivered to students? Indeed, how are technology-enhanced learning (TEL) service models evolving within higher education institutions to support these new forms of teaching and learning?

A plethora of papers has recently been published on the changes occurring across the HE sector during the pandemic. These publications broadly address three key themes, namely: (i) changes to the design and delivery of study programmes; (ii) the adoption of new technologies in course delivery; (iii) the staff and student experiences of online teaching. Considering how the pandemic has changed programme delivery, attention has focused on the rapid move to online learning, followed by the reported greater use of blended and HyFlex or Hybrid teaching methods [4–7] as students and staff have returned to campus. Alongside programme delivery, the pandemic has also reportedly accelerated changes in assessment practices, such as a move to open-book exams and continuous assessments [8,9].

To facilitate the move to online teaching, institutions are reported to have adopted a range of new technologies to support course delivery and assessment activities. Course leaders for disciplines such as engineering, science and medicine have explored the use of multimedia and virtual reality to facilitate practical activities such as virtual labs [10] and virtual field trips [11,12]. Virtual learning environments (VLEs) and videoconferencing tools are reported to have been commonly used to support assessment activities [13,14], with an increased use of proctoring tools to maintain academic integrity in online exams [15–17].

Attention has also been focused on the student experience during the pandemic, reflecting on how well learners adapted to the move to online learning. Papers have explored the greater flexibility that online teaching methods brought to student learning [18], whilst also noting challenges around social isolation, struggles with technology, wifi and study spaces, and general mental health and wellbeing [19]. Some students would not recommend online delivery to others, based on their experiences in the pandemic [20].

It is noteworthy that the emerging literature is predominately based on academic perspectives on the rapid move to online delivery [21]. Less attention has been paid to the experiences and views of instructional design teams and e-learning professional services, which played a vital role in supporting their institutions' move online, providing a wealth of support, training and guidance to academic staff.

The majority of these papers also lack long-term perspectives on how learning technology usage will evolve. With the return to campus-based teaching and pre-pandemic learning and teaching arrangements, it is unclear which innovative practices from the emergency remote teaching (ERT) phase will 'stick' and what new approaches will be carried forward [1,22]. This paper seeks to fill a gap in the literature by focusing on institutional Heads of E-Learning and their perspectives of the pandemic and the developments arising from it. Heads of E-Learning are a community of senior staff engaged in promoting, supporting and developing technology-enhanced learning within their respective UK higher education institutions [<https://helfuk.blogspot.com/p/about-helf.html> (accessed on 10 June 2023)]. They are an important stakeholder group with service leadership and professional development responsibilities for the effective use of learning technology in course delivery within UK HE institutions.

Drawing on longitudinal survey data (2018–2022) [23–25] and more recent qualitative evidence based on panel discussions (2021–2022) [26–29], this paper reports on the views of institutional Heads of E-Learning and uses their reflections as a lens through which to look at learning technology developments across the UK HE sector. The combined dataset provides a framework from which to explore their perspectives on three key questions:

- Research Question 1: Following the emergency remote teaching phase and the subsequent return to campus-based teaching, has the impact of the COVID-19 pandemic accelerated the adoption of new technology across the higher education sector? If so, how has this been achieved?
- Research Question 2: In the eyes of Heads of E-Learning, what impact has the pandemic had on programme design, delivery and assessment methods? To what extent, if at all, has this encouraged new approaches to pedagogical design and new engagement patterns between staff and students to be developed?
- Research Question 3: Has the pandemic transformed the way that faculty (teachers and administrators) who are new to online teaching are supported, helping them to develop the requisite competencies and strategies to work effectively in this domain?

The Section 3 of this paper presents the key findings from the combined survey and the panel discussion qualitative data. The reporting of the results is divided into sub-sections, dealing first with the pre-COVID context in UK HE, before going on to discuss the impact of the pandemic on investment in TEL services, programme delivery and professional development opportunities for staff using learning technology. The Section 4 of this paper summarises the key findings in relation to the research questions and draws links with other relevant research publications considering the implications for future sustainable practices in the use of learning technology within higher education.

About the UCISA Research

The authors of this paper are current members/associates of the Digital Education Group (DEG), a working group of The Universities and Colleges Information Systems Association (UCISA) [<https://www.ucisa.ac.uk> (accessed on 10 June 2023)]. UCISA is a member-led professional body for digital practitioners within education, which is committed to tracking technology developments across the UK higher education sector. Since 2001, UCISA has run the technology-enhanced learning (TEL) survey to look at what, over time, have variously been described as virtual learning environments (VLEs), eLearning, managed learning environments (MLEs) and now technology enhanced learning tools. The term technology-enhanced learning (hereafter referred to as TEL) refers to any online facility or system that directly supports learning and teaching. This may include a formal VLE, e-Assessment or e-Portfolio software tool, or lecture capture system, mobile app or collaborative tool that supports student learning.

2. Materials and Methods

2.1. Mixed-Methods Research Design

The study investigated the insights and perspectives of Heads of E-Learning on learning technology developments within the UK HE sector after the COVID-19 pandemic. A sequential mixed-methods research design was adopted [30], drawing on survey data [23–25] and then panel interviews [26–29] to develop a rich picture of technology developments. A quantitative survey approach was used to collect data on learning technology investments, the provision of support for TEL services and the role of technology in course delivery within UK HE institutions both before and after the pandemic. This was intended to establish the context of TEL services and to identify any changes in technology provision and practices arising from the pandemic period. The entire population of Heads of E-Learning was targeted for survey returns.

The qualitative phase of the research was then conducted through panel interviews and aimed to provide a layer of interpretation to the survey data, as experienced and articulated through the voices of Heads of E-Learning. A purposeful sampling approach [31] was used to identify participants for this phase of the research. The interviews focused on determining how Heads of E-Learning viewed the impact of the pandemic on learning technology usage within their institutions, and how they see future developments unfolding, with the onus on sustainable TEL practices.

2.2. UCISA Surveys

In this paper, we present data from the 2022 UCISA Survey [25], which invited Heads of E-Learning to reflect on key areas of learning technology provision that might have been affected by the COVID-19 pandemic. We compare these findings with those collected immediately before the pandemic in March 2020 [24] and in 2018 [23]. By comparing data across the three surveys, we sought to track: (i) TEL developments leading up to the pandemic; (ii) the extent of the impact of COVID-19 on the adoption and use of learning technology by UK HE institutions (UK HEIs).

Invitations to complete the 2022, 2020 and 2018 surveys were sent to institutional Heads of E-Learning at all Universities UK member institutions [<https://www.universitiesuk.ac.uk/about-us/our-members> (accessed on 10 June 2023)]. Table 1 shows the number of responses for the 2018, 2020 and 2022 surveys and reveals that 50% or more of UK HE institutions completed survey returns over this period. Whilst we cannot judge whether there was any consistency in the role and identity of institutional respondents over the years, the range of responses for each survey is representative of different institutional groups and geographic locations across the UK HE sector. Where possible, we attempted to corroborate survey findings through the panel discussions with institutional Heads of E-Learning, as well as by cross-referencing findings against other published studies and reports on TEL development.

Table 1. UCISA Technology Enhanced Learning (TEL) Survey returns by UK higher education institutions: 2018–2022.

Survey Year	Total Possible	Number Responding	% Responding
2022	152	76	50%
2020	155	96	62%
2018	160	108	68%

The 2022 Survey retained 16 questions from the 2020 and 2018 surveys, enabling a longitudinal analysis to be undertaken. This common set of questions focused on four key themes, namely: (i) TEL tools and services—how they are used, supported and reviewed; (ii) course delivery—the types of courses and tools being used; (iii) staffing for TEL services; (iv) recent and prospective developments in TEL.

2.3. Panel Discussions

To add a layer of interpretation to the TEL survey data, panel discussions were conducted with institutional Heads of E-Learning in 2021 and 2022 after the completion of the surveys [26–29]. A purposeful sampling approach was employed [31] to invite the Heads of E-Learning from a representative range of higher education providers, with attention to the size, region and purpose (teaching and/or research-intensive) of institutions within the UK HE sector. Participants were drawn from the Universities of Aberystwyth, Bath, Ulster, Leeds Conservatoire, City, University of London and The Open University in 2021, and the Universities of Falmouth, Sheffield and Ulster in 2022.

Participants discussed their perspectives on the learning technology developments associated with the emergency remote teaching (ERT) phase and the return to campus-based teaching, and their views on sustainable changes in technology usage for the future. The 2021 panel sessions paid particular attention to teaching models [26], culture and institutional drivers of technology usage [27], team and organisational structures [28], and, in December 2022, to the new digital education landscape that is emerging across the UK HE sector [29].

Transcripts were generated for each panel discussion, and then coded independently by the authors according to the four key themes of the survey questions, with the output being subsequently cross-checked. The output from the coding of the transcripts is summarised in the reporting of the results in Section 3. The summaries illustrate the shared perspectives of Heads of E-Learning on technology developments and help to interpret specific aspects of the survey data.

2.4. Ethical Considerations

Approval was received from UK HE institutions for their TEL survey data to be presented in aggregate form in research reports and studies. Participants in the panel discussions gave their informed consent for their contributions to be recorded and shared in a public domain, and reported on in research publications.

3. Results

3.1. Pre-COVID-19 Context: Investment in TEL Services to Enhance Student Learning

Much has been made of the COVID-19 pandemic and the ‘pivot’ to online learning, but this should not mask the steady investment in learning technology tools and services by UK HEIs, which was in evidence in the preceding years [32,33]. The 2020 survey data [24] revealed that virtual learning environments, text-matching tools, document-sharing and asynchronous communication tools had all become part of a common tool-set used by institutions in their course delivery. Investment was part of a long-standing commitment to the enhancement of the student learning experience through the use of learning technologies, although technology was largely used to supplement traditional campus-based teaching

delivery. Blended learning, based on the provision of supplementary online learning resources, represented the most common form of course delivery, with 79% of respondents indicating that this approach was used extensively across their institution, compared to 73% in 2018 and 79% in 2016.

The 2020 survey data also revealed that a new generation of team-based environments (e.g., MS Teams, Slack) had been gaining traction in the UK HE sector, combining the conferencing and messaging features of social media with file-sharing and searching capabilities as part of an integrated, cross-platform solution. Fifty-eight UK higher education institutions (62%) had established a centrally supported collaborative tools service before the COVID-19 outbreak, and 67% had reviewed their collaborative tools provision and implemented Office 365 (including Teams) as a result. Indeed, collaborative tools and learning analytics were the top two services identified by survey respondents in 2020 for planned pilots over the next two years, which indicates the increasing importance of these virtual spaces to facilitate and track student engagement in individual and group-based learning activities.

In the 2020 data, legislative changes were reported to have an impact on the sector, with the Equality Act (2010) [34] and the Public Sector Bodies (Websites and Mobile Applications) (No.2) Accessibility Regulations 2018 [35] both placed among the top seven drivers for TEL development. This impact was also reflected in the data regarding reviews of TEL tools or facilities, with 24 institutions (37%) confirming that they had reviewed digital accessibility tools in the previous two years; the majority of reviews resulted in the implementation of tools such as Anthology Ally.

The way that institutions were supporting these new TEL services was also reported to be changing. The UCISA survey data [24] revealed a steady increase in the mean number of learning technologists within institutions from 2016 to 2020, with the largest growth in distance/online learning units (mean of 4.47), although this was attributed, in part, to several institutions with large distance/online learning teams. In 2020, there was a mean of 6.58 learning technologists within TEL units, as well as 6.89 in local support within schools or faculties. When asked about changes to TEL staffing provision in the previous two years, 70 institutions (79%) reported that changes had been made, with 36 (40%) reporting an increase in the number of staff. Looking at the combined UCISA data in the round, the picture that emerges is one of steady investment and growth in TEL services and support to teaching staff prior to the pandemic. To what extent, if at all, did the pandemic introduce further changes to the UK HE sector?

3.2. COVID-19 and Its Impact on Technology Investment

The impact of the COVID-19 pandemic appears to have further accelerated these investments in technology, as illustrated in Table 2. Table 2 provides a longitudinal view of the leading tools that are centrally supported by UK HE institutions. The 2022 data [25] show that VLEs, formative e-assessment tools, media streaming, webinar/virtual classrooms, asynchronous communication tools and content management systems now appear as common elements of institutional TEL provision across the sector. When reviewing which software tools are most commonly deployed in course delivery (see Table 3), the data show that VLEs and content management systems (CMS), digital/learning repositories, the electronic management of assignments and reading list software are all commonly deployed in 75% or more of courses within an institution. The most notable development from 2020 was the use of virtual spaces for collaboration and discussion. The 2022 data reveal that 24% of UK higher education institutions are now using webinar/virtual classroom tools across all of their courses, whereas none did so in 2020, and 73% reported using them for the majority ($\geq 50\%$) of their teaching, as opposed to only 5% in 2020.

Table 2. Longitudinal view of centrally supported technology-enhanced learning (TEL) provision: 2018–2022 top 6 software tools).

Centrally Supported TEL Tools	2022	2020	2018
Virtual learning environment (VLE)	100%	91%	94%
Formative e-Assessment tools (e.g., VLE quiz)	99%	82%	81%
Media streaming system (e.g., Kaltura, Medial, MS Stream, Panopto)	99%	58%	63%
Webinar/Virtual classroom (e.g., Blackboard Collaborate, MS Teams, Zoom)	99%	72%	53%
Asynchronous communication tools (e.g., discussion forums)	97%	84%	84%
Content management systems (e.g., OneDrive, SharePoint, VLE)	97%	18%	27%

Table 3. Percentage of courses using technology-enhanced learning (TEL) tools: 2018–2022.

Top 7 TEL Tools	Year	100%	75–99%	50–74%	25–49%	5–24%	1–4%	0%	Don't Know
Virtual learning environment (e.g., Blackboard, Brightspace, Canvas, Moodle)	2022	72%	23%	1%	0%	0%	0%	0%	4%
	2020	61%	34%	3%	0%	0%	0%	0%	2%
	2018	42%	50%	2%	1%	1%	1%	0%	3%
Content management system (e.g., OneDrive, SharePoint, VLE)	2022	41%	28%	4%	8%	8%	3%	1%	7%
	2020	9%	6%	1%	7%	10%	11%	18%	38%
	2018	6%	13%	4%	10%	9%	12%	12%	35%
Digital/learning repository (e.g., ePrints, Equella, VLE)	2022	39%	16%	7%	5%	5%	4%	7%	16%
	2020	7%	10%	6%	10%	10%	15%	17%	26%
	2018	6%	14%	3%	9%	9%	15%	14%	31%
Electronic Management of Assignments	2022	30%	32%	4%	0%	1%	0%	16%	16%
	2020	17%	40%	10%	3%	7%	5%	6%	12%
	2018	18%	44%	7%	9%	4%	1%	5%	12%
Reading list management software (e.g., Leganto, Talis)	2022	30%	32%	14%	11%	0%	1%	5%	7%
	2020	17%	37%	15%	7%	2%	3%	12%	7%
	2018	16%	28%	13%	12%	5%	1%	13%	13%
Accessibility tools (e.g., Blackboard Ally, Yuja Panorama)	2022	26%	20%	8%	4%	8%	3%	16%	15%
	2020	-	-	-	-	-	-	-	-
	2018	-	-	-	-	-	-	-	-
Webinar/virtual classroom (e.g., Blackboard Collaborate, MS Teams, Zoom)	2022	24%	34%	15%	9%	5%	0%	3%	9%
	2020	0%	2%	3%	10%	38%	23%	7%	17%
	2018	1%	0%	3%	7%	26%	34%	4%	26%

3.3. COVID-19 and Changes to TEL Service Management

The UCISA surveys have invited institutional leads over the years to provide data on the TEL service management models that they support. The 2022 data [25] not only confirm that the core toolset has expanded but indicate changes in the way that these technologies are being supported by UK higher education institutions. The outsourcing of TEL services continues apace, with 93% of institutions now using third-party organisations to manage their provision of TEL services, compared to 83% in 2020. Typically, this is achieved through Software as a Service (SaaS) licensing and hosting agreements, with virtual learning environments (VLEs) (79%), lecture capture (75%) and media streaming systems (70%) representing the leading SaaS services across the UK HE sector. Comparing data before and after the pandemic, the uptick in the percentage of institutions outsourcing these services is noticeable, as shown in Table 4. The transition to cloud-based services enabled institutions to support the swift incorporation of new functionalities through frequent releases and more agile change management for their digital learning and teaching services.

Table 4. Longitudinal view of outsourced technology-enhanced learning (TEL) provision: 2018–2022.

Outsourced TEL Service	2022	2020	2018
VLE platform—supporting the delivery of blended learning courses	79%	32%	33%
Lecture capture platform	75%	46%	23%
VLE platform—supporting the delivery of fully online courses	74%	25%	26%
Media streaming system	70%	33%	-
Virtual classroom	59%	-	-
e-Portfolio	50%	34%	35%
Digital repositories (e.g., Google Drive, Google Docs)	49%	34%	10%
VLE platform—supporting the delivery of open online courses	47%	27%	21%
Learning analytics	33%	9%	-
Other service	8%	-	12%
No outsourced provision	7%	20%	19%

The shift to the cloud has made the scalability of services much easier to achieve and change management more feasible to undertake. These developments have most likely contributed to the increasing frequency of TEL service reviews undertaken across the sector, as reported in the 2022 survey data [25]. A total of 71% of institutions confirmed that they had conducted a VLE review over the past two years, and there had been a particular focus on reviewing new service delivery areas, e.g., 41% of institutions reviewing polling services and 37% reviewing digital accessibility tools. A total of 70% of responding institutions are planning to review their TEL service provision over the next two years (2022–2024).

The evidence points to a continuous cycle of TEL service reviews, facilitated by the outsourcing of service provision and management responsibilities to third-party organisations. This emerging practice was highlighted in panel discussions with Heads of E-Learning. Falmouth University reported that it has moved from end-of-contract service reviews, previously conducted every 3–5 years, to reviews conducted once a year, in line with curriculum changes, but also in response to supplier changes to terms and conditions and as a requirement for data protection impact assessments, etc. [29]. Falmouth University and the University of Sheffield both noted that they are now opting for shorter 1–2-year licensing contracts, supporting the piloting of new services and what they could be doing differently, which gives them the scope to evaluate new technologies and determine whether they want to invest long-term in these services.

When reviewing and making procurement decisions, UK HE institutions are also focusing on achieving better integration across the portfolio of institutional digital systems that they support. Ulster University has declared a commitment to Microsoft technologies and to achieving a deeper integration between its curriculum management system and the institutional VLE, paying attention to the transfer of grading data between these systems [29]. Indeed, both Ulster and Falmouth have stated that any tool or digital service linked to the institutional VLE must be Learning Tools Interoperability (LTI)-compliant [29]. This suggests that the ecology of centrally supported digital services is in a constant state of flux, as institutions ponder what impact the introduction of a new service will have on the other TEL systems that are centrally supported. What has been driving this increased level of investment in learning technology services?

3.4. Drivers of TEL Development

The UCISA TEL surveys have been tracking drivers for TEL development since 2010, as illustrated in Figure 1. The 2020 data [24] reported that ‘enhancing the quality of learning and teaching’ and ‘improving student satisfaction’ remained the top two drivers. The data also showed that inclusive practice, particularly in response to legal requirements such as the Public Sector Bodies (Websites and Mobile Applications) Accessibility Regulations 2018 [35], had an impact on TEL provision and development across the sector.

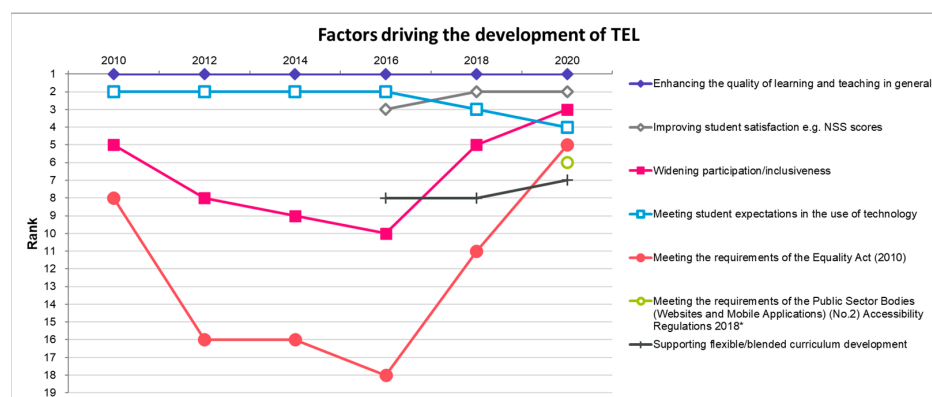


Figure 1. Factors driving the development of TEL 2010–2020.

Whilst drivers for TEL development were not directly addressed in the 2022 survey, they were discussed in the 2021 and 2022 panel interviews with institutional Heads of E-Learning [27,29]. Digital accessibility has continued to be a strong driver for change, a development confirmed by the institutional leads for the Universities of Ulster, Aberystwyth, Sheffield and Falmouth [27,29]. Both the Open University and Sheffield University reported that digital accessibility provision had become more embedded within their respective institutions and Ulster University’s representative noted that the pandemic had a direct effect on promoting inclusive teaching practices.

As a widening access institution, I do think that COVID has allowed us to have some more valuable conversations about access to education and inclusivity. It has been satisfying to see activity increase in these areas and for that to be reflected in the UCISA survey. Inclusivity and Universal Design are very much aligned to Ulster’s strategic ambitions’ [27].

Indeed, the panel interviews revealed other facets of online teaching provision that gained traction due to the effects of the pandemic. The Open University highlighted the impetus that ERT had given to the institution’s sustainability agenda, and the growing recognition of the importance of flexible teaching and learning strategies—‘almost legitimising and accelerating a direction we were already heading in, reducing risk aversion slightly along the way’ [27]. It also highlighted the need to place staff and student well-being at the heart of the rapid digital transition that the university is undertaking. This suggests that the pandemic is influencing lasting changes to institutional policy and practices, but to what extent is this leading to a transformation in approaches to programme delivery? To what extent is technology now being employed to support different modes of teaching and learning activities?

3.5. Impact on Programme Delivery

The UCISA data [25] reveal that the key change since 2020 has been in the way in which learning technologies are being used to support more active blended learning. This relates to the use of technology to support the active engagement of learners in collaborative or assessed tasks. Table 5 shows that 36% of institutions reported that this mode is supported extensively across the institution in 2022, compared with 20% in 2020 and 18% in 2018. This represents a step-change from the traditional use of learning technology as a supplement

to the student learning experience and one predominantly focused on content provision (i.e., the digital provision of lecture notes and additional resources to students).

Table 5. Percentage of institutions offering blended learning, which requires students to engage in active learning online (e.g., engaging in collaborative or assessed tasks).

Active Blended Learning	2022	2020	2018
Offered extensively across the institution	36%	20%	18%
Offered across some schools/departments	49%	40%	43%
Offered by some individual teachers	11%	36%	35%
Not yet, but planning to	0%	2%	3%
Not offered and no plans to do so	3%	1%	1%
Don't know/not applicable	1%	0%	0%

The panel interview data suggest that the rise in active blended learning delivery may be attributed, in part, to more planned approaches to the use of technology in curriculum design during the ERT phase. Institutions such as Leeds Conservatoire redesigned their learning technology support for teaching staff from a 'how-to' tools focus in March 2020, to more considered uses of technology over the next academic year. This was achieved by introducing a flipped learning course for all staff to follow in preparation for the 2020–2021 academic year, addressing how to adapt the curriculum to get the most out of contact time on campus for performance and practical work [26]. At Ulster, there has been a much greater focus on active learning, as well as socialisation and group work, in curriculum design activities. Ulster was one of many institutions to pursue alternative approaches to assessment, which have embraced more open and authentic formats, such as the creation of podcasts and video submissions, over essay submissions [27].

This has blurred the boundaries between online and traditional classroom teaching environments in terms of the role that technology can play in supporting active student engagement, offering new opportunities for innovation. However, we must be careful not to exaggerate the scale and significance of alternative course delivery modes within institutional programme delivery. The 2022 survey data show that Hybrid/HyFlex delivery has been slow to take root, with only 9% of institutions supporting this extensively in their teaching activities. Fully online delivery has doubled in activity since 2020, but from a low base, and it remains a niche delivery mode, with only 9% ($n = 7$) of respondents supporting this extensively within their institution. As Jisc has observed [36], innovating with new programme delivery formats comes with practical challenges, such as staff development of design and teaching using mixed-delivery modes, as well as technology investment. How have UK HEIs been addressing these staff development challenges in recent years?

3.6. Changes in Professional Development Opportunities and Support for TEL

The UCISA research has explored both the range and diversity of training opportunities that HE institutions offer their staff, as well as the staffing support models that they have employed to encourage technology adoption. The panel interviews focused on professional development activities carried out in response to the pandemic, whilst longitudinal survey data captured the development of staffing support provision in recent years, with the key findings summarised below.

3.6.1. Professional Development Opportunities for Staff

During the emergency move to online teaching, institutions provided a range of professional development opportunities to help upskill staff as quickly as possible. This included workshops, one-to-one consultations, self-study online courses, toolkits, drop-in sessions.

Falmouth University reported that, as part of the move to online teaching, every staff member attended a training session, which means that instructors are now more comfortable with designing a blended curriculum. Furthermore, the Falmouth Digital Learning team has become part of the programme approval process, so they are able to

ensure that blended learning design principles are embedded in programme developments from the start [29].

Both Aberystwyth and the Open University [27] reported an increased focus on sharing best practice across the institution and highlighted the importance of peer support amongst academics in developing online teaching practices. The pandemic also enabled greater availability of online continuing professional development (CPD) opportunities for all staff, which benefited both academics as well as TEL support staff, who were able to connect with others from outside of their institution. Ulster reported that a shift to more of a project focus enabled greater partnerships and collaborations amongst different teams, and this approach helped with upskilling staff in specific areas. As a result, staff are now coming to them with a greater understanding of what is possible with technology [27]. Finally, the Open University noted the importance of continuous dialogue and investment in training to support staff digital literacies and teaching online, as this is an evolving area [27]. This ties back into the need to enable staff to share practice across the institution.

3.6.2. Changes in TEL Staffing and Support

The 2022 survey data [25] revealed further changes in TEL staffing levels within institutions since the last survey in 2020, as presented in Table 6.

Table 6. Whether changes to staffing provision had been made in the last two years.

TEL Staffing Provision	2022	2020	2018
Changes made	95%	79%	81%
No changes made	5%	21%	19%

A total of 95% of responding institutions reported changes to their staffing provision, with 54% confirming that there had been an increase in the number of permanent TEL staff over the last two years, and 23% reporting an increase in fixed-term staffing (Table 7). When asked about why these changes had been made, respondents identified the COVID-19 pandemic as a key factor, as well as the need to support new technologies (e.g., webinar and digital assessment platforms) and support online provision.

Table 7. Types of changes made to staffing provision in the last two years.

Changes Made to Staffing Provision	2022	2020	2018
Increase in the number of permanent staff	54%	-	-
Increase in number of staff	-	40%	40%
Change of existing roles/incorporated other duties	39%	40%	30%
Restructure of department(s)/TEL provision	34%	37%	38%
Increase in the number of fixed-term staff (e.g., contract of 6 months or longer)	23%	-	-
Reduction in number of staff	16%	25%	22%
Recruitment delay/freeze	20%	10%	14%
Other change in staffing provision	10%	8%	6%

The increase in TEL staffing levels was corroborated as a finding by all interview panellists [28,29]. Several institutions reported using fixed-term roles to temporarily boost staffing numbers in response to the additional demands for moving teaching online, or to support specific initiatives. In some cases, these roles were made permanent and increased the overall number of staff supporting TEL. For example, the University of Bath reported a rise in the number of short-term instructional designer posts, many of which have been made permanent and incorporated into the central team [28]. City confirmed an increase in fixed-term staffing to support key strategic projects, such as digital accessibility, digital literacies, learning design and learning spaces [28]. Sheffield University [29] reported an increase from 12 to 20 staff; however, many of these posts were fixed-term contracts and

staff were not retained. Large projects, such as a VLE upgrade, were expected to bring in more staff on a temporary basis.

In the 2022 webinar discussion, the panellists and audience commented on the challenges of recruiting to TEL roles, particularly in-demand roles such as learning design, where hybrid working meant that some institutions were more flexible about time on campus. For example, at Falmouth, one quarter of the Digital Learning team are on remote contracts, which provided access to a wider pool of applicants.

A total of 39% also reported a change in existing roles/incorporation of other duties. Both Ulster and Sheffield [29] reported a shift away from operational activity to more project-focused work, with staff now acting as consultants or stakeholders in institution-wide strategic learning and teaching projects. Falmouth has seen a change in the type of support they offer, with less ad-hoc/bespoke support due to increased demands on the team impacting their capacity. To mitigate this, they are working more with suppliers to create documentation for frequent issues or using existing resources, such as LinkedIn Learning.

With the increase in demand for TEL support staff, institutions have looked at other ways to encourage new staff to join the team. For example, Falmouth [29] established a digital learning intern role for recent graduates, whilst City [28] noted the importance of their Assistant Educational Technologist role, which encouraged staff from other parts of the institution to consider a TEL role. In both cases, this helped to provide a recruitment funnel into the team as well as opportunities for progression.

4. Discussion

Drawing on the combined data set from the UCISA surveys and interview transcripts, a number of changes to institutional TEL services and staff support provision are discernible across the UK HE sector in response to the COVID-19 pandemic. Returning to the research questions, the key developments may be summarised as follows:

4.1. Research Question 1: Has the Impact of COVID-19 Accelerated the Adoption of New Technology across the Higher Education Sector? If So, How Has This Been Achieved?

The 2022 UCISA data reveal an extended core set of supported learning technology tools and services, which higher education institutions now commonly support across the UK sector. These include webinar/virtual classroom tools, which served as virtual spaces for collaboration and discussion during the ERT phase. The move to SaaS hosting has enabled institutions to acquire new services and deploy them rapidly—which, in turn, has supported shorter timeframes from making a procurement decision to deploying a TEL service.

Greater investment in cloud-based toolsets and in institutional support for learning technologies—with faster releases of new features—also appear to be enabling higher education providers to offer greater flexibility in the delivery of education [7].

We reported on the evidence of increased investment in TEL support roles and the diversification of roles and responsibilities in supporting an expanding learning technology portfolio—a product of the COVID-19 response—but this is also most likely a reflection of the maturing and embedding of technology across institutions that has been going on for a long time [33].

4.2. Research Question 2: In the Eyes of Heads of E-Learning, What Impact Has There Been on Programme Design, Delivery and Assessment Methods? To What Extent, If at All, Has This Encouraged New Approaches to Pedagogical Design and New Engagement Patterns between Staff and Students to Be Developed?

The combined data indicate that advances in technology provision and TEL support services are being used to underpin more flexible and inclusive learning designs, which engage different categories of learners. The 2022 survey data highlight future developments making new demands on support in UK higher education, with new modes of course delivery (e.g., blended or online learning), and Hybrid or HyFlex teaching representing the leading challenges facing HE institutions. The focus on flexible learning, indeed,

appears to be a global trend in programme design and is highlighted in other reports by the Quality Assurance Agency for Higher Education [7] and EDUCAUSE, with the 2023 Horizon report [37] noting an increasing student demand for flexible and convenient learning modalities:

‘Students place less importance on in-person classes and more on online options, especially Hybrid and HyFlex courses. As institutions plan for sustainability, they will need to be intentional—a “one size fits all” approach will not work. Colleges and universities will need to figure out how to design learning experiences that vary in format and the way they are accessed but are equivalent in quality and learning outcomes’ [37].

The UCISA evidence also points to technology services being used to support more active and engaging learning experiences. Embedding of learning technology as part of an active learning design process for campus-based and flexible delivery formats is identified as an emerging practice. This finding is shared in other recent research outputs—notably Jisc’s survey of the UK HE sector on current practice/challenges around developing curriculum and learning design approaches and practice [36]. The Jisc research has found evidence of more flexible, asynchronous approaches being introduced in teaching, which optimise the curriculum for the most appropriate blend of in-person and online activities. Other publications have reported on the opportunities that are now being offered to students for new types of learning experiences, such as immersive learning mediated through virtual and augmented reality [38,39]. The 2022 UCISA survey data show that the adoption of immersive environments by UK HE institutions is still in its early stages, but growth is discernible, with a few institutions having established augmented and virtual reality platforms as supported services.

Considering more recent developments, we should also note the potential impact of generative AI tools such as ChatGPT and the embedding of GPT-4 in Microsoft products on the education sector in promoting the case for changes in the way that we design for learning and assessment activities. ‘The newest technology creates new opportunities to personalise learning and teaching, create educational material in multiple forms, and streamline administrative tasks’ [40].

Taking all of this evidence into account, we may concur with Rapanta et al. [41] that the conditions now present themselves for sustainable change in the way that learning technology is used to support student learning:

‘The overall picture now reveals an openness towards innovation and new learning opportunities that were not as evident before’ [41].

Notwithstanding criticisms of the quality of some of the blended online provision that was offered to students during the ERT phase [42], the combined evidence from UCISA research and other national surveys [7,36,37] suggests that a watershed has been reached in terms of the way that learning technology is being employed by instructors. Purposeful uses of technology are being designed for campus-based courses and directed to support more active student learning outcomes. We see evidence of pedagogical openness and support to explore more active and flexible learning approaches. However, context is key here, and most commonly these innovations represent enhancements to campus-based courses and not to other formats such as Hybrid/HyFlex delivery, which are a long way from representing mainstream teaching approaches.

4.3. Research Question 3: Has the Pandemic Transformed the Way That Faculty (Teachers and Administrators) Who Are New to Online Teaching Are Supported?

The UCISA evidence confirms that there has been a steady increase in the number of TEL support staff as institutions have scaled up their online delivery over the past two years. A proportion of these staff are in fixed-term roles, introduced to help meet the immediate challenges of the emergency remote teaching phase as well as addressing specific strategic projects areas. It is unclear how many of these roles will be converted into permanent posts, but the evidence indicates that TEL support is increasing, and responsibilities are being shared more widely across professional service support, impacting new areas such

as learning design and learning spaces. It also suggests that learning technology and learning design support within programme/curriculum development is no longer an 'add on'/supplement but viewed as a core element of the student learning experience. This is evidenced in the sector by an increase in the number of learning designer roles being advertised, with a peak in 2021 [43].

So, taking all of this evidence into account, what does the long-term picture for learning technology within higher education look like? A cautionary note is needed when attempting to predict future technology developments. Whilst we may confidently predict that investment in new technologies will likely continue apace and the sector will need to adapt to external challenges such as the release of generative AI tools [40,44], it is much harder to predict how staff will take advantage of these new opportunities to innovate and adapt teaching practices. As our evidence and other reports show [36], staff engagement with TEL development faces challenges in terms of workload management (time) and incentives (reward and recognition). This touches on the incentives that staff are given to modify their instructional practice, as well as the digital skills that they need to support more active and engaged student learning [45,46].

The carrying forward of innovative practices from the ERT phase of the pandemic is, therefore, contingent on instructional competencies (capability) and the capacity of teaching staff to update their knowledge and skills through engagement in continuous professional learning and development [22]. This should not focus exclusively on technical competencies but should also place equal importance on the development of 'digital fluency' [33]—by this, we mean how pedagogically prepared teaching staff are to take advantage of new technology opportunities, as well as how incentivised they are to innovate and explore new modes of learning. This has been captured in frameworks such as TPACK [47], which assert that effective teaching with technology practices depends on content knowledge, pedagogical knowledge, and technological knowledge.

Engaging staff in continuous training and learning development in the use of technology has been a longstanding challenge for the sector, and one that requires major changes to professional development programmes in higher education to focus on how to design teaching with the students' learning needs at the centre [48]. In our view, it is professional development and the sharing of good practice that hold the key to sustainable changes in the use of learning technology to embed more flexible and student-centred teaching approaches. In practical terms, this may be addressed by institutions in a number of ways, ranging from the introduction of dedicated training modules to the establishment of communities of practice and partnerships, which explore sustainable and effective approaches to the use of learning technology in teaching practices.

5. Conclusions

This article draws on UCISA survey data and panel interviews with institutional Heads of E-Learning to highlight the changes in learning technology usage brought about by the COVID-19 pandemic. The reporting of UCISA research aimed to fill a gap in the existing literature, addressing institutional perspectives on learning technology developments and future trends. This is intended to complement the existing literature, which has predominantly focused on the academic experiences of the emergency remote teaching phase at the course or programme level, rather than across the institution as a whole.

The UCISA evidence reveals the steady investment in learning technology that UK HE institutions have been making over recent years, leading to the establishment of core learning technology services prior to March 2020. The pandemic acted as a spur, causing the UK HE sector to take further steps to scale up technology investment and promote the wider adoption of tools and services by teaching staff. This, in turn, offered new opportunities in the way that study programmes are designed and delivered to support student learning. However, we need to take care when using terms such as 'pivot' to describe online learning developments during the ERT phase and beyond; this implies that course delivery has irrevocably changed across the HE sector in favour of more

flexible, technology-mediated approaches—a conclusion that is not supported by the UCISA evidence. Whilst a shift away from supplementary uses of technology to more active and engaged blended learning design is discernible in the UCISA survey data, Hybrid and HyFlex delivery modes currently remain quite limited in scale across the sector. For lasting changes to occur, we conclude that supporting foundations must be put in place, governing the incentives and ongoing professional development offered to teaching staff to equip them with the skills to innovate and adapt their teaching and course delivery methods in a sustainable way. This requires HE institutions to develop a joined-up strategy for TEL investment and professional development in the effective use of technology in teaching, to address the learning needs of the future.

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