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1. Abstract

This paper extract is part of ongoing research and guidance being developed in collaboration between UIS Teaching and Learning Systems and the Technology Enabled Learning Service. It is designed to support academic planning for academic year 2021-2022 and to help navigate the complexities and rapidly growing queries surrounding Hybrid and Hyflex delivery.

This extract focuses on what Hybrid is and what it looks like at the University of Cambridge, exploring the technical and pedagogical constraints we face, the challenges caused by Hybrid delivery, and some suggestions on how to navigate these. Due to the varied nature of teaching at Cambridge and the differences between subjects, this serves as general guidance and reference material to inform departmental decision making and planning. This guidance is designed to support consistent communication across the University and align terminology for effective inter-departmental discussion. Where appropriate, links to further resources and contacts have been included.

The full paper will include more detailed exploration of existing case studies across the Higher Education sector, investigations into how Hybrid can be integrated as part of the curriculum, and more detailed information to help overcome logistical, technological, and pedagogical challenges faced.

2. Definition of Delivery Models

Each model contains recommended next steps to be taken into consideration when planning. Where necessary, we have included Cambridge specific details to frame the guidance so that it is relevant and appropriately facilitates the collegiate experience as much as possible.

2.1 Clarification of Terminology Used

To support the wider common understanding of this material, below are some clarifications regarding terminology used within the models presented.

In-person teaching and learning

Activities in which all participants are in the same physical space.

Online learning

Exclusive use of technology to facilitate teaching and learning for participants who remain distanced from one another

Blended learning

Blended learning refers to broader curriculum design that incorporates a range of face-to-face, digital, and online content throughout a programme of study. Students undertake the same activities at primarily the same time. It can include elements of hybrid delivery within the curriculum context.

Hybrid learning

Hybrid learning, whilst previously used interchangeably with blended, has become more commonly used to refer to a mode of delivery which enables students to engage with content either online or in person with relative ease. Hybrid assumes all students will engage with content via the same mode, however, this also includes sessions in which the audience is split between online and in person.

Asynchronous

Learning that does not occur at the same time for all participants. This can vary greatly in practice, however, generally assumes that learners will access and complete material at their own pace.

Synchronous

Learning that takes place with all participants engaging with material in real-time. It's worth noting that there can be a mix of both synchronous and asynchronous in a single session.

Flipped Classroom

A model of teaching and learning in which students engage with new content via asynchronous materials ahead of live, synchronous sessions used to further deepen understanding and contextual awareness of this content.

Hyflex Model

The name combines Hybrid and Flexible to describe a curriculum model, like blended, in which students will engage with a variety of synchronous and asynchronous content, however, the main difference in Hyflex is the ability for students to personalise their learning and undertake different elements of the course at a different time, or the same content via different modes (online or in person).

2.2 Key Considerations

Before determining which model is suitable for your intended delivery, the following considerations are provided as a frame of reference for establishing and maintaining an effective level of student engagement, participation, and quality of teaching and learning.

1. Ensure students are able to maintain an appropriate presence within the learning context
2. Ensure the model chosen supports the meeting of identified learning outcomes
3. Ensure all aspects of accessibility, equality, and inclusivity are met throughout a session
4. Maintain the level of excellence and quality standards integral to the University
5. Maintain an appropriate level of academic rigour, critical discussion and debate, and exchange of ideas

2.3 Hybrid Delivery Methods

- **Hybrid Teaching & Learning:** A synchronous teaching session with planned peer-to-peer, and peer-to-academic interaction, where the audience are both on site and remote
- **Hybrid Audience:** A synchronous didactic delivery method requiring no/minimal student participation where the audience are both on site and remote

Both methods can serve as an integrated element of wider blended curriculum design

- **Blended Curriculum:** A combination of synchronous and asynchronous models of delivery and student engagement, combined for greater flexibility, accessibility, and inclusivity.

2.3.1 Hybrid Teaching & Learning

A synchronous teaching session with peer-to-peer, and planned peer-to-academic interaction where the audience are both on site and remote accessing online. More appropriate for seminars, supervisions, or smaller group teaching.

Overview

Hybrid teaching and learning is the most complex delivery method and requires a high level of planning and consideration, both technologically and pedagogically, to ensure students can engage with all aspects of their education. The audience will be a mix of those attending in-person and online. This method will require the academic facilitating the session to ensure a consistent level of engagement and equal presence for all students, and equal opportunities for all students to interact as required. It is worth noting that Panopto Lecture Capture cannot facilitate hybrid teaching and learning in any capacity and must only be used for live streaming or hosting of pre-recorded content.

To effectively facilitate hybrid teaching and learning, we recommend an in-depth review of available technology and, where necessary, appropriate procurement of hardware. The need to ensure a consistent level of presence and opportunity may require multiple screens used for teaching resources, as well as microphones and audio equipment so interaction from those in-person can be heard by all accessing



online. It is not sufficient to simply segregate the online and in-person communities, as the intention of a Hybrid Teaching & Learning session is to fully integrate all participants. A recent example from the Harvard Business School (Simkin, 2020), demonstrated that these methods of delivery can require large amounts of investment in time, money, and staff to effectively accommodate.

In addition to this, rooms identified for hybrid teaching and learning will need to review their current network, power, and ventilation to ensure that students can seamlessly access content whilst multiple video and audio channels are being streamed from the same location. Stable and robust networking is required to alleviate potential connection issues and ensure the learning experience is not hindered. The increase in devices, network, and power, also require effective ventilation to maintain safe temperature levels for longevity of hardware, and comfort of those participating in-person. Many of these changes will prove challenging across Cambridge due to the unique nature of the estate.

Once a room is set up for hybrid teaching and learning, there needs to be consideration before, during, and after the session concludes to ensure inclusive and accessible participation for all students.

- **Before:** Consider how you will ensure an equivalent and integrated experience for all learners, regardless of location; this needs to take into account things like the students' time zones, the learning outcomes of the session and how you expect these to be achieved, and how you will clearly explain to students in both groups the "different but equal" experiences they will receive. Ensure you have considered the individual learning needs of your students and that all proposed activities and resources are inclusive and accessible by design, or at least are presented in an adaptable format. What activities can be provided pre-emptively to support the intended session? Refer to appropriate resources and guidance to ensure materials are designed with inclusivity in mind and are as accessible as possible to the widest range of students.
- **During:** Facilitating a hybrid session can provide challenges for staff, especially when faced with potential technical issues and limited on-hand support available, in addition to the potentially overwhelming cognitive load required of facilitating an effective session for students on site and remote. Effective and appropriate management of these sessions requires time and resource commitments. Can every student hear all conversations and see all resources? Are you able to easily communicate with each student without disrupting the session? Are students able to access the session appropriately onsite or online? Is everyone able to engage and respond equally? You may consider using a more structured facilitation approach with discussion, questions, or learning activities drafted ahead of the session and made to be readily shareable for both the onsite and online students. It is likely that spontaneous questions (e.g., 'are there any questions about this material?') will be more difficult for the online audience to engage with.
- **After:** Consider how you will consolidate the learning experienced in the sessions through additional activities and resources. How will you gather feedback and review the experiences of both groups of students, to ensure they are meeting your goals? How will your course develop as a result, or how will you address any identified gaps?

Recommended Next Steps

If considering hybrid teaching and learning as your preferred method of delivery, we recommend:

- Review and understand what activities, resources, and methods of delivery within a Hybrid Teaching and Learning context can be made accessible and inclusive for as many students as possible. Refer to the [Disability Resource Centre \(DRC\)](#) for further guidance.
- Reviewing identified teaching spaces within the school, faculty or department and determine the hardware needed to ensure all students have effective presence during any given session. Communicate with a relevant computer officer in the first instance to better understand the capabilities of current equipment and identify potential gaps
- Once hardware needs are identified, to conduct a review of power, network, audio insulation, and ventilation and determine resource needs to facilitate effectively
- Plan sessions accordingly to accommodate potential time-zone differences
- Determine platform of choice for synchronous communication (e.g. MS Teams, Zoom) and how students will interact to pose questions, discuss content, and access any further aspects of planned sessions. *Remember, wherever possible, to try and provide a similar quality experience for all participants regardless of how they attend the session*
- Plan for more structured discussions and interactions with students to create equity of opportunity to participate amongst both the onsite and the online audience
- Aim for decisions to be driven by pedagogical reasoning and equity for the student experience, rather than technology steering the planning
- Incorporate student feedback and invite student reps to initial discussions to understand what has been successful, and what may have caused some to struggle in the past

2.3.2 Hybrid Audience

A synchronous didactic delivery method requiring no/minimal student participation (Live Broadcast) where the audience are both on site and remote accessing online. More appropriate for larger classes, lectures, and any context in which information is primarily delivered to students rather than engaged with collaboratively.

Overview

Delivering to a hybrid audience, whilst still requiring active considerations to provide an equal and accessible experience for all, does not require as much investment in technological provision compared to hybrid teaching and learning. These sessions are typically planned with minimal, if any, live student participation and mostly rely on the delivery of content or information from a single source. A lecture would typically suit hybrid audience where all learners are unable to observe from the same location, whereas a seminar may require more interactivity as identified above (Oxford Centre for Teaching and Learning, 2020).

To facilitate the session effectively, you will need to be considerate of all students throughout the session, especially if you are delivering to some participants in-person. Aim to provide an equal opportunity for students to engage and observe regardless of how they are accessing the session. This might include alternative methods for asking questions or responding in kind to ensure all students can hear or read all sides of the discussion. A student asking a question in person without a microphone means those studying online will only hear an answer. This can be mitigated by the lecturer repeating the question, having it typed in chat as well or instead, use of polling software, and more, however, it still requires additional consideration for the session to offer equitable quality for all students despite difference in platform. Consideration for appropriate time to ask questions is highly recommended as some students may take longer than others or have more complex

questions. This enables all to access the question and respond equally without limiting student's presence in the conversation. The priority here is for inclusive and accessible observation as opposed to participation.

Teaching spaces identified for delivery to a hybrid audience will require some investment to ensure a quality set up, however, will not require the same level of requirement as stated above. Basic provision can include a single microphone for those delivering, with facilities for sharing screens and other necessary content. A monitor for the lecturer to be able to observe online participants is recommended, but not required. This is because whilst there is less interaction, it can be helpful for the lecturer to read physical cues to identify appropriate pace, tone, and understanding. Whilst this will differ depending on personal preference, providing the facility to observe can be important. This reduced hardware requirement and management of technology also lowers the need for constant on hand support, however, it suggested that effective onboarding and training in the use of facilities is made available for all staff. Current provision at the University, including Panopto and the wider Lecture Capture Service, does support this model of delivery, however, there is a time delay when broadcasting live which should be taken into consideration.

When considering a session for a hybrid audience, there again needs to be some careful management before, during and after the session to ensure effectiveness.

- **Before:** Consider how students will be able to ask questions and respond if necessary. Will you make use of available technology to facilitate some level of interaction throughout such as polling software, chat functions and reactions? How will you recommend students ask questions if not in the live session? Will you offer supplementary Q&A sessions, online forums, or other platforms? What materials could be shared beforehand to support the session? Does the session need to run entirely live or can it be supplemented with asynchronous activity as well? Refer to appropriate resources and guidance to ensure materials are designed with inclusivity in mind and are as accessible as possible to the widest range of students.
- **During:** There may still be a need for additional support and staffing during a session depending on your use of materials and resources. If you intend to deliver a session with a range of multimedia or devices such as document readers, whiteboards, texts, objects, and more, then consider additional staff to facilitate the session and support technical issues. How will students respond and interact if at all? How will you pace the session and structure comfort breaks if appropriate to do so?
- **After:** How will you enable students to ask questions effectively if not within the sessions itself? How will you respond to these and provide suitable feedback without increasing workload to an overwhelming level?

Recommended Next Steps

If considering hybrid audience as your preferred method of delivery, we recommend:

- Review and understand what activities, resources, and methods of delivery within a Hybrid Teaching and Learning context can be made accessible and inclusive for as many students as possible. Refer to the [Disability Resource Centre \(DRC\)](#) for further guidance.
- Reviewing identified teaching spaces within the school, faculty or department and determine the hardware needed to ensure communication is clear, consistent and of equal quality for all observing participants
- Planning sessions accordingly to accommodate potential time-zone differences

- Determining platform of choice for synchronous communication (e.g. MS Teams, Zoom) and establishing ground rules for any instance of interaction to maintain consistency for all
- Considering the ways in which you will offer attendance opportunities to ensure clear communication with students; is online attendance available only for students who are unable to travel to Cambridge, for any student at any time, or for students who may have difficulty travelling around Cambridge?
- Incorporate student feedback and invite student reps to initial discussions to understand what has been successful, and what may have caused some to struggle in the past

2.4 Developing a Blended Curriculum

2.4.1 Learning Design

A combination of synchronous and asynchronous models of delivery and student engagement, combined for greater flexibility, accessibility, and inclusivity.

The two models described above are to be considered as part of a wider curriculum plan to ensure success. This curriculum plan would be most effective if technology is integrated throughout to maximise the potential and provide a variety of engagement for students. A blended curriculum is seen in much of the existing practice developed throughout the Covid-19 pandemic and, utilising a mixture of live delivery to a hybrid audience (see above) and asynchronous learning activities, there is a great deal of flexibility and capacity for staff and students.

An appropriately blended curriculum will require more time investment as opposed to technical requirements. In some cases, this model will benefit from, or sometimes require, the adaptation of previously used materials, pre-recorded content and activities to suit a new teaching and learning context. This model can support a wider variety of delivery methods in combination with one another and can be developed to support individual creativity and teaching preferences whilst, with planning and consideration, maximising appropriate consistency within faculties and departments to provide the best possible experience for students.

In supporting live, synchronous delivery we encourage the ongoing development and use of Moodle to facilitate supplementary asynchronous activities and cultivate online communities for the wider dissemination and exchange of ideas.

2.4.2 Students' Digital Experience

In 2020, The Quality Assurance Agency for Higher Education (QAA) produced a paper intending to help build a taxonomy for digital learning. In this paper they developed five broad classifications of digital learning focusing on the student experience and perspective (Building a Taxonomy for Digital Learning, 2020). The following are introductions to each classification (see Table 1) to aid in decision making for the year ahead, and to help focus on the impact these decisions may have on the student experience. Please note that regardless of which level of digital experience you intend for your students, it is highly recommended to integrate inclusive design principles to ensure as wide a range of students as possible can access the materials effectively. Find out more about accessibility and inclusive design on the [DRC's Inclusive Teaching and Learning Moodle Course](#).

All classifications on the following page are presented for clarity, however, we recognise that most, if not all, areas of the University likely fit within the central three, supportive, augmented, and interactive, for the year ahead.

<i>Passive</i>	<i>Supportive</i>	<i>Augmented</i>	<i>Interactive</i>	<i>Immersive</i>
<p>Minimal teaching and learning to be offered with technology. Students predominately engage in person and technology is only used for digital presentations, sharing of basic materials, and online communication when necessary. This offers limited personalisation for the student experience and maintains analogue formats for most work, including assessment.</p>	<p>Teaching and learning is experienced primarily on site and in person, however, technology is used to support these sessions where appropriate. Moodle is used to share materials and resources, some interactive polling or communication tools are utilised, and there may be use of recorded video content for students to engage with digitally. Some opportunity for personalisation but mostly limited to the resources provided digitally.</p>	<p>A much more balanced use of digital and analogue methods in which teaching and learning activities are delivered on site and online depending on what is most appropriate and effective for the context. Large scale lectures may be delivered online with simple interaction, whereas small group sessions are held in person to facilitate deeper conversation. Moodle is used more consistently to not only share resources and materials but provide engaging activities that can be completed asynchronously and are integrated into the curriculum and learning design. Greater opportunity for personalisation and developing assessment methods to use digital or online platforms.</p>	<p>When digital teaching and learning activities are designed as the primary method of engagement for students. Some activities such as supervisions, practical sessions, and small group discussions can be held in person, however, most of the learning, communication and delivery of content is effectively facilitated online or digitally in a learning space. Moodle is a fully integrated, developed, and utilised platform together with additional tools such as Teams, Zoom, Panopto Lecture Capture and more. Assessment methods are more fully considered as digital or online processes to better facilitate and maintain accessibility and inclusivity.</p>	<p>Much more akin to distanced learning courses as all teaching and learning activities are engaged with online and students are offered no opportunities to engage onsite at the provider. This offers a great deal of flexibility and personalisation, and still has the potential for synchronous delivery through online communication platforms, however, does not support the collegiate experience well established at Cambridge.</p>
<i>Less technology</i>		Blended Curriculum		<i>More technology</i>
Hybrid Audience			Hybrid Teaching and Learning	
Lower new resource implications	Resources include, but not limited to, hardware, software, training, and personnel			Higher new resource implications

Table 1: Student Digital Experiences

2.4.3 Developing your Blended Curriculum

The development of a blended curriculum is a continuous journey, in which responses and planning will differ heavily depending on subject, staff, student cohorts, assessment requirements, and local policies and procedures. Each course will have a unique blend to offer students a suitable level of autonomy, flexibility, and accessibility. We recommend giving thought to the following considerations, to place yourself on the spectrum of digital experience above and determine your preferred offering:

- Consider the student experience and which aspect would be most appropriate for your subject and learners
- Determine which aspects of delivery will be synchronous or asynchronous
- Identify any required areas of modification to adapt to new circumstances
- Review current use of Moodle, Panopto, and other online platforms to determine exemplar practice and areas for development
- Communicate with colleagues to share experiences and lessons learned
- To facilitate planning and development of a blended curriculum, we recommend using the [Learning Design Toolkit](#) developed for the University of Cambridge
- Exploring potential activities, resources, and existing examples may help to inspire development and innovation. Review the materials provided in the [TEL Learning Scenarios Moodle Course](#) to get started

2.5 Support

Whilst there has been a great deal of improvement and progress made since March 2020, we recognise that many will continue to find challenge in the year ahead as we navigate still uncertain times. Below are recommended channels of support to refer to when planning for academic year 2021-2022.

Please note that a more comprehensive and in-depth analysis of hybrid working practices including additional case studies, Cambridge specific guidance, discussions of hybrid in the curriculum, and more will be published soon. This guidance is intended as initial communication to inform and advise on immediate planning.

- For how to make the most of technology within your curriculum, and other questions concerning the pedagogical use of technology, you can access guidance from the Technology Enabled Learning (TEL) Service via their website: [Technology-Enabled Learning Service](#)
- For further guidance on the use of:
 - Moodle: [Moodle | Student Systems \(cam.ac.uk\)](#) or refer to [Help for Staff: Moodle Help Home \(cam.ac.uk\)](#)
 - Panopto Lecture Capture: [Lecture capture | IT Help and Support \(cam.ac.uk\)](#)
 - Turnitin: [Turnitin UK | Plagiarism and Academic Misconduct \(cam.ac.uk\)](#)
- For broader guidance and support for teaching and learning, you can access a range of guidance on the Cambridge Centre for Teaching and Learning (CCTL) website: [Cambridge Centre for Teaching and Learning](#)
- For advice and guidance on how to develop accessible and inclusive teaching and learning materials, visit the [Disability Resource Centre's Accessible Materials](#) website

- You can access a catalogue of recorded webinar sessions from the TEL Service on the TEL Webinars page (Raven login required): [TEL Webinars](#)

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