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Combining proximate with online learning in real-time: Ambidextrous teaching and pathways towards inclusion during COVID-19 restrictions and beyond

Abstract

COVID-19 forced universities to engage in rapid improvisation and adoption of online learning and teaching. This paper explores 'real-time blended' learning in which online students are taught simultaneously with students who are experiencing proximate learning. Two cliques could develop with those learning online becoming observers rather than participants in an active learning process. This paper is based on action-based research to develop an inclusive approach to simultaneous teaching of proximate and online students. This approach includes alterations in classroom layout, the equipment used, facilitating varying modes of social interaction and the role of communication. Effective teaching requires continual minor modifications to teaching design and delivery. This represents an ambidextrous approach to teaching in which teachers focus on the immediate co-creation of student experiences, but also identify cues which are used to adjust the ways in which they engage with a student cohort over the course of delivering a module. Module evaluation becomes an ongoing process in which alterations are made in real-time and to subsequent learning encounters with students. The paper evaluates student performance and concludes that the approach went some way towards ensuring equality of the student experience between those learning online and those proximate with the lecturer.

KEYWORDS*:* COVID-19, online teaching, real-time blended learning, inclusion, learning design, active learning, ambidextrous teaching

The COVID-19 pandemic represents a cultural inflection point for teaching and learning. Rapid improvisation has occurred as universities substituted proximate with online learning (Bryson and Andres, 2020; Carrillo & Flores, 2020; Horton, 2020, Žižek, 2020). Cultural inflection points change the future. In 2007, O'Hara called for a "paradigm shift in education" that included "more effective teaching and learning" in the context of radical technological innovation (O'Hara, 2007: 970). Applications that were never imagined have been developed. There have been many benefits from the application of technological solutions to support the teaching-learning interface including the development of learning management systems (LMSs) (Pinho *et al*., 2018). COVID-19 has forced radical and rapid adoption of technological solutions to learning and teaching across the educational system including rapid improvisation of online teaching and learning, including assessment, supported by innovative approaches to the curation of learning resources on LMSs (Bryson and Andres, 2020; Day et al., 2020).

The rapid adoption of online learning will produce permanent alterations in approaches to teaching practices. These include enhancing the role LMSs play in supporting learning and teaching (Hershkovitz, *et al*., 2011) and the development of a "curation-orientated learning paradigm" (Bryson and Andres, 2020: 614). There are many challenges related to teaching online. These include encouraging and enhancing inclusive approaches to student engagement (Redmond, *et al*., 2018). This is a multidimensional challenge involving the design of resources on LMSs, student support systems, and the balance between synchronous and asynchronous learning experiences. This resonates with the debate on intersectionality which highlights that vulnerability, disadvantage and exclusion are explained by the intersections of multiple factors including gender, ethnicity, and class. These intersections produce overlapping and interdependent systems of discrimination or disadvantage and advantage (Ho & Maddrell, 2020). The impacts of COVID-19 on student learning and

experiences reflect differences in the ways in which social groups are experiencing the impacts of the pandemic. This is an intersectionality and human rights issue, but it is also a geographical problem related to experiencing learning via different combinations of proximate and online learning.

The challenge that we explore in this paper is that of teaching students who are online simultaneously with students who are experiencing proximate learning experiences. This has become an issue as more vulnerable students are unable to engage in proximate learning, foreign students being unable to travel, students having to self-isolate or shield, students with disabilities and those with childcare responsibilities. With COVID-19, people were required to self-isolate by not leaving their homes when they have or might have COVID-19. Self-isolation was an important policy response to help prevent the virus spreading. Individuals considered to be at high risk from COVID-19 were advised to shield and this included not engaging in proximate learning. With self-isolation and shielding, University teaching had become an exercise in what we term *real-time blended learning* in which lecturers had to develop solutions to teaching students who are co-present in time, but not in place with students who are co-present in time and place. The paper explores the pedagogic challenge of developing an inclusive approach to facilitating learning experiences which does not disadvantage students who are co-present in time compared to those students who are co-present in time and place with the lecturers. The approach was to develop an integrated *real-time blended learning experience* to avoid the online group observing the learning process from afar rather than engaging in a process of active learning based on interactive social communications. This must be avoided as it is this group that may contain more vulnerable students, and students who require additional support and encouragement (Boling *et al.*, 2012).

This paper is based on action-based research to develop an inclusive approach in teaching sessions involving simultaneous proximate and online learning delivery. The challenge was to experiment to ensure that students experiencing both forms of learning delivery approach received similar types of learning experience. This is to highlight the role the teacher plays in curating the micro-geographies of the learning environment to enhance participation, inclusion, and equality of learning experience.

The paper is divided into seven sections. The first explores inclusion in the context of both proximate and online teaching modes and proposes that the blending of these modes in real-time may progress the inclusion agenda. The second section provides an account of the teaching context, setting and pedagogical problem that is addressed in this paper. The third positions this teaching and learning challenge in the context of the existing literature. Sections four and five describe in detail the teaching approaches developed to encourage inclusion in teaching students via the application of a real-time blended approach. This section includes a discussion of the design of physical space, the equipment required, varying modes of social interaction and communications. Section six reflects on the need for the lecturer to display agile or ambidextrous qualities in delivering an inclusive teaching experience. Section seven concludes with some thoughts about what we have learnt about teaching practices during the COVID-19 period that may be adopted longer term to enhance student inclusion, engagement, and active learning.

The Context: The Learning and Teaching Challenge

COVID-19 initially closed universities forcing rapid adoption of online teaching. This was unexpected; very few universities had plans in place for this scale of disruption (Day, 2015). The duration of the pandemic has meant that pedagogical adaptation has been an on-going process involving both complete teaching online and subsequently balancing synchronous

with asynchronous learning. With COVID-19, the University of [**name removed for the peer review process**] improvised by developing a 'bi-modal' approach to learning and teaching. This approach was adopted by some UK universities in response to COVID-19 and was based on the premise that learning in each module must be able to take place both online and on-campus and that both learning modes should deliver the same high-quality learning experience (Bryson and Andres, 2020: 613). This approach included the design of high levels of student support including weekly tutorials. It included modifications in response to the individual circumstances of students and teachers. All modules were allocated teaching teams to enhance the resilience and agility of learning delivery. The expectation was that students could choose between online or on-campus learning.

The development of this bi-modal approach assumed that modules would be delivered over a semester with lectures and small group tutorials provided on a weekly basis. Weekly delivery allowed for a certain amount of flexibility in blended delivery. Face-to-face lectures could be pre-recorded, and small group interactive seminars could be run multiple times using different combinations of online and on-campus delivery. The blend could alter in response to any place-based alteration in COVID-19 lockdowns. This approach resonated with the recommendations for educators in response to COVID-19 highlighting the importance of empathy, humanity, simplicity, agency and collaboration in the learning design and co-learning process (Bozkurt *et al.*, 2020: 111).

Some teaching, however, did not fit with this approach to bi-modal design. The challenge was with modules that were delivered in blocks rather than over a semester. With block teaching, a module is delivered over 4 or 5 days and is designed to meet the needs of students studying part time as they balance learning with working and everyday living. These blocks are designed around student engagement including group work which might include working into the evenings. This introduces constraints and challenges that are not present in modules

taught over a semester. For example, lectures must be delivered to all students simultaneously irrespective of the learning mode (online/proximate) they have selected. The key here is that active participation in the interactive learning process requires engagement with the material delivered via a more traditional lecture format. The added complication is that block taught modules have a sense of immediacy in which the resources provided to support the interactive learning are based on current events. This means that pre-recording lectures for those studying on-line would result in a very different learning experience. One of the pedagogical challenges was ensuring that the interactive learning process did not result in the formation of two groups – online versus classroom-based learners. This is the challenge that is explored in this paper.

The paper is based on the experience of delivering one block taught course in September 2020. The learning design was based on two principles:

1) To develop an inclusive learning design which blended online and proximate learning in real-time.
2) To design a module in which the student experience was based on interactive social communications between students and with the teacher.

This was a small class of 20 students. On day one of this module's delivery, 12 students had decided to engage in face-to-face on-campus learning and eight elected to learn online. This division changed by day two as the media reported an increase in the rate of COVID-19 transmission in the city. Two students decided to shift to the online learning mode resulting in an equal division between students studying online and those participating in classroom-based learning encounters. For some students, this was the first module that they had taken in this programme while other students had already completed modules. Not all students knew one another, and friendships had to develop during the delivery of the module. It was

important to ensure that the students taking this module did not divide into two friendship cliques – those working together in time and space and those online.

This paper explores the problems related to the simultaneous teaching of students who are online with those who are proximate or co-present in time and space. This is about developing an integrated approach to real-time blended learning avoiding the possibility of those online experiencing a form of online exclusion as those co-present with the lecturer may dominate the active learning process. The problem is both one based around the physical design of the teaching space combined with facilitating the balance between simultaneously teaching students who are online with those who proximate. This challenge includes three assumptions:

1) Equality of the student experience between those learning online and those who are proximate.
2) Students should be able to choose between a traditional face-to-face learning environment and online learning environment. This choice reflects their personal situation including students who were shielding as they were more vulnerable to COVID-19 or who had to temporarily self-isolate.
3) Both groups of students should interact with one another; friendship and support networks should form across the student cohort.

The teaching design was informed by the literature on blended or hybrid learning. We now place the pedagogical challenge explored in this paper in the context of the literature on blended learning and teaching under crisis situations.

Blended Learning: Proximate Versus Online Engagement and Inclusion

Occasional disruptions to learning are common related to illness, inclement weather or even "competing commitments" (Day, 2015: 75). In 2015, Day highlighted the importance of

academic continuity planning as a formal proactive process rather than one that was casual or reactive. In this account, he noted that "natural disasters, acts of violence, and the threat of pandemics have pushed university and college administrators to be more aware of the need to maintain appropriate learning environments when conventional face-to-face teaching and learning is impossible" (Day, 2015: 76). Day cogently noted that "plans for academic continuity during inter-pandemic periods, including online teaching have been recognised as important but are rarely delivered" (Day, 2015: 76). These plans must include communication strategies based on blending different communication channels including social media (Hildebrand, 2017). COVID-19 challenged existing approaches to academic continuity planning forcing universities to engage in rapid improvised innovation (Day *et al*., 2020, Bryson and Andres, 2020).

There is an important literature on education adaptation in response to crisis. This includes Day's paper that explores solutions to cover a one-week absence of a teacher to papers that explore teaching adaptations in response to earthquakes or hurricanes (Hildebrand, 2017; Collings et al., 2019). Much of this literature focusses on rapid substitution of face-to-face with blended learning to "enable student engagement in an extreme context" (Mackey, 2012: 44) whilst recognising the needs of diverse groups including on-campus and off-campus students. Student engagement is a complex process as it is shaped by the time, effort, energy, and resources students apply to enhance their learning combined with the role played by interactions with teachers and other students (Chen *et al*., 2010). Teacher's shape or influence engagement and may act as curators or facilitators of conversations and social encounters that support active learning.

Facilitating inclusive synchronous online learning student experiences is challenging. On the one hand, there are technological challenges related to networking problems. On the other hand, there are problems related to reading non-verbal cues and the absence of social support

that comes via unplanned and planned social encounters (Lee *et al*., 201; Kuong, 2014; Panigrahi, 2018). This includes chat to support learning. Proximate learning comes with very different problems. Some of these relate to sightlines and the design of the physical space of the classroom and some relate to ensuring that there are equal opportunities for all to engage in the proximate learning experience (Montgomery, 2008).

There is an extensive literature on distance learning, rapid improvisation of educational provision during times of crisis and on comparing online learning environments compared to proximate leaning (Collings *et al*, 2019; Godlewska *et al*., 2019; Tang et al., 2020). The gap that is addressed in this paper is the challenge of combining online with proximate learning in real-time. The emphasis in the existing literature has been placed on managing the interface between asynchronous and synchronous online teaching (Murphy, 2011; Bryson and Andres, 2020). This includes the literature on blended or hybrid learning which involves learning and teaching that combines online educational resources and interactions with more traditional face-to-face learning encounters (Godlewska et al., 2019). The terms 'hybrid' and 'blended' learning are used interchangeably in the literature, but the term hybrid tends to be associated with a higher proportion of online activity. Blended and hybrid learning are very different to complete online learning experiences or distance learning. An alternative approach is 'flipped learning' in which students engage with resources outside the classroom and class time is devoted to the application of learning to active problem-solving and practice activities (Love *et al*., 2014, Godlewska, *et al*., 2019; Tang, *et al*., 2020). In this approach, students' study before rather than after attending a classroom session. The flipped approach enables proximate learning to focus on active learning based on discussion and the application and enhancement of critical thinking. Online teaching is "characterised by different traditions" (Crampton et al., 2012: 2) requiring different levels of emotional and intellectual investment by students studying online (Pittaway & Moss, 2014). In the online environment, a student

might be a name on a screen attached to a black box or a stylised image. In a classroom setting it is impossible for a student to hide behind a black box and all in the room can read non-verbal cues.

Learning is a social process. This is a formal and informal process and is one that ideally should seep beyond the confines of the classroom as students engage in planned and serendipitous social encounters. Much of the literature on learning design has focused on cognition rather than on facilitating social learning. A recent study on student retention and learning design identified that the primary predictor was the "relative amount of communication activities" included in the learning design (Rienties *et al*., 2016: 339). It is important to create learning environments that encourage interactive social learning. There are different types here including "finding and handling information", "communicative activities" with other students, "experimental activities" based on students applying their learning to some real-life setting, "interactive activities" based on simulations and case studies and "assessment activities" in which the focus is on formative assessment (Rienties *et al*., 2016: 335). Rapid adoption of blending learning in response to a crisis may disrupt the social dynamics of learning by disadvantaging those students who are severed from social learning support networks (Kuong, 2014; Bryson and Andres, 2020) and especially serendipitous social encounters. Part of the challenge in continuing to provide learning and education during a crisis involves providing students with "some sense of continuity and normality, which online resources could not provide" (Collings *et al*., 2019: 247).

The literature on online learning has tended to focus on the development of student-student interactions and building a learning community (Tang et al., 2020). These are important processes, but for online learning encounters a key factor in enhancing learning outcomes is a "strong 'teacher-presence' to encourage interactivity in discussion boards, blogs and other media" (Stone and Springer, 2019: 149). Teacher-presence, and the roles played by the

teacher, is critical for facilitating proximate learning, and this is a core area for further research. In both settings, learning may be compromised by a lack of interaction with teachers and other students (Mackey *et al*., 2012: 42), time management and problems accessing resources. In an online environment, the added complications include technical problems, including engaging with the online teaching platform, social isolation, and difficulties in accessing support (Ilgaz and Gülbahar, 2015; Stone and Springer, 2019; Bryson and Andres, 2020).

With COVID-19, universities across the world had to engage in rapid improvisation rather than the development of distance learning (Bao, 2020; Bryson and Andres, 2020). The speed of response was important as universities had to rapidly substitute proximate with online learning (Bryson and Andres, 2020). One review of COVID-19 and responses by country noted the importance of "understanding the lived experiences of learners" and that "emergency remote education strategies need to be adapted to ensure that no learner is left behind or further disadvantaged" (Bozkurt *et al*., 2020: 4). Strategies identified to ensure inclusion included "flexibility with course requirements, promptness, clarity of communication, multiple points of contact, personal connections, reciprocity of caring, and student centered design and teaching practices" (Bozkurt *et al*., 2020: 4). The emphasis was placed on developing a student-centred approach to learning design and delivery that acknowledges the importance of interactive social communications to support and deepen learning whilst simultaneously enhancing the student experience and reducing the possibilities of social isolation. This requires different solutions depending on class sizes and learning outcomes to ensure the equality of the student experience.

With COVID-19, initially all university teaching shifted online. Nevertheless, in the UK context, for example, universities reopened in September 2020 with "enhanced cleaning measures, social distancing on campuses and changes to timetables to stagger and manage

attendance on site" (Williamson, 2020). This introduced an added complication with the introduction of a new form of *real-time blended learning* in which lecturers had to cope with teaching students who were simultaneously proximate and online. The option always exists to teach these as separate groups. This requires two different learning designs, but perhaps more importantly it divides students taking the same module into two groups with very different types of learning experience. There is an inclusion issue here with the most vulnerable to COVID-19 having to experience social isolation and a different form of social communication and learning experience. There is the added complication of students who are engaging in proximate learning having to shift temporarily to online learning as they entered a 14-day quarantine period. Thus, the challenge explored in this paper is how to blend proximate with online learning in real-time.

Real-time Blended Learning: Developing an Inclusive Approach to Simultaneous Online and Proximate Classroom Teaching

The module was taught over four days with a three-hour session every morning and afternoon. Each three-hour session was divided into three parts. The first hour explored theory and key conceptual frameworks, illustrated with short case studies. The second hour was an interactive class discussion usually focusing on the practical application of the theory, or framework explored and discussed during the first hour. During the third hour the class was split into groups of 4 students to apply the theory based on the development of a group case. There was a short break between each of these 3 sessions and a two-hour lunch break that students could use to extend the time devoted to group work. This blurred the distinction between the classroom-based setting and a more informal setting.

The driving principle that guided this module's learning design was a focus on equality of the student experience between those engaged in online learning compared to those experiencing

proximate learning. This approach to inclusive design was informed by dialogue and reflection and reflected a process informed by rapid planned improvisation. Part of this process included adjustments during the delivery of the module as part of a student/teacher co-creation process. A dialogue was encouraged between all students to inform alterations in the learning design as the module was delivered over the four days. This was a form of action-based teaching improvisation focused on enhancing the student experience focusing on quality and equality.

The solution to this teaching challenge required both the application of technology combined with alterations in the classroom layout. The latter was an exercise in reconfiguring the micro-geography of the classroom to facilitate an inclusive approach to real-time blended learning. Video conferencing technology (the Logitech GROUP videoconferencing system for medium to large meeting rooms) was used with a high-quality microphone placed in the middle of the classroom. This microphone was able to pick up speech from both the lecturer and students wherever they were in the teaching room. A freestanding camera was used that could be controlled remotely. The camera could zoom onto individual speakers or zoom out to show the whole class. The video conferencing platform adopted was Zoom. This university uses the Canvas learning management system and Zoom had been incorporated into Canvas. One implication is that Zoom sessions that are recorded are automatically uploaded on the module's online customised learning platform on Canvas. This included automated transcription. The first and second sessions (lectures and class discussions) were recorded but not the third session (small group discussion). The online students agreed to use their cameras during class discussions, but some turned cameras off during PowerPoint lectures, particularly where bandwidth was an issue. The proximate students agreed that their images could be temporarily captured by the camera. This became part of the learning experience. No student was reluctant to appear on screen. This could have been a problem. The module

commenced with a student discussion regarding module delivery with all students participating. Classes with very large student cohorts might find it difficult to persuade all students to appear on screen. The recommendation is to discuss module delivery as part of a student discussion and to co-create a set of learning expectations. This may include the adoption of Zoom virtual backdrops to reduce distractions and to hide differences between student residential environments.

An initial challenge was the design of the teaching space. There is a tendency for universities to provide spaces that are standardised to meet some university agreed approach. This has many advantages based around economies of scale but does restrict teaching innovation. The same approach is applied to LMSs with the development of a university-wide template which restricts customization. Ideally, both teaching spaces and LMSs should be adaptable to meet the needs of a module's learning outcomes (Johnson *et al*., 2020). We requested that the module would be taught in the same classroom for the duration of the module. Teaching a class of 10 in a lecture theatre designed to accommodate 50 allows for flexibility in its use. The same room was used throughout the four days. The lecture theatre was arranged in a horseshoe shape with a screen for projecting material used in the lectures located at the open end of the horseshoe. In a conventional teaching session, typically the lecturer would stand at the front of the class facing students with their back to the screen. Alternatively, the lecturer might roam about by walking into and around the horseshoe. Teaching to proximate and online students required the classroom to be 'flipped'. This alternative form of 'flipped' teaching involves alterations to the micro-geography of the classroom and the sightlines between the online and proximate students and the lecturer.

In this classroom, the camera was located at the screen end of the room pointing towards the class so that online students could engage with the class. The lecturer faced the camera and screen. The online students, on Zoom, were projected on to the screen. Those online could

see and engage with those in the classroom and vice versa. By facing the camera, the lecturer appeared to be speaking directly to the online students and by facing the screen, where the online students were projected, meant that the lecturer was facing their images. This established contact between the lecturer and the online students. The horseshoe layout meant that some proximate students were in the lecturer's sightline during the first hour of each three-hour session. This physical orientation meant that the lecturer had their back to some students based in the classroom. Nevertheless, this layout was an attempt to produce a level playing field between students located in the classroom and those online. The key was to try to develop some form of equality of experience between the lecturer and students focussing on the nature and quality of the interactions. The danger was that the online students might consider themselves to be observers rather than active participants. The teaching design was based on the co-creation of the learning experience. The online students could physically raise a hand and be seen by the lecturer and face-to-face students could simply speak up to engage in the discussion. In responding to proximate students, the lecturer would turn towards those speaking and away from the camera and the students online. Teaching 'in the round' created a physical manifestation of the equality of the student experience.

Managing and Facilitating Online and Proximate Social Interactions

Both conventional blended learning, and the flipped approach, require the teacher to focus on the management of student interactions. The key is to facilitate active learning based on social interactions between the students and the teacher and between students. Teaching using a real-time blended approach is especially challenging. Nevertheless, an inclusive approach to learning design can be developed when careful attention is given to developing a learning design that enhances social communications between proximate and online students. There were four types of interaction to consider.

First, interactions between the whole class – all 20 students and the lecturer. Here it is important to appreciate that there are differences in the experiences between those who are proximate compared to those who are online when engaging in classroom social interactions intended to support the co-creation of the learning experience. Online students are at a slight disadvantage to those in the classroom for two reasons. On the one hand, there is a slight delay when speaking online even with the fastest broadband connections. This problem is intensified when online students must come off mute (normal practice) before being able to speak. This slight delay is enough to discourage online students from just speaking up because 'the moment' might have passed. On the other hand, it is more difficult for online students to 'read the room' and this includes listening and following the room's 'buzz' and observing and reading non-verbal cues. This reflects the difference between watching live theatre compared to watching from afar and on a small screen. Much of the ambience is lost or diluted.

When engaging in discussion or conversation we watch for cues and these are a combination of verbal and non-verbal cues. We also signal using non-verbal cues when we would like to take over control of a conversation. This type of signalling is blunted in online interactions. It is important to focus on these taken for granted cues when we engage in online teaching. By reading a room it is possible to see if someone else is waiting for their moment to speak through reading their body language. This may include an awareness that a student is waiting to engage as they may lean forward to indicate that they want to take over the conversation. Reading these cues is much more difficult online. It is further complicated when online students are trying to engage with students who are present with one another in place and time, rather than just in time.

Three teaching strategies were identified and deployed to overcome the disadvantages experienced by online students compared to proximate students. The focus here is on

enhancing inclusion and ensuring that all students have similar opportunities to engage in active learning:

1. Online students were encouraged to make dramatic physical gestures including raising their hands or waving when they wanted to interject. The lecturer and other students were able to rapidly pick up these movements. More normal non-verbal cues are lost in the online environment and must be replaced with more dramatic gestures.
2. The second hour of each session revolved around a lecturer facilitated discussion. One issue was that students located physically with the lecturer might dominate the discussion and those online might observe and rapidly disengage from the teaching encounter. The classroom might become a form of reality television in which online students observed rather than interacted. One solution was to begin the discussion with the online students and then facilitate a dialogue between those online with those students located in the classroom. The lecturer must ensure that all students, irrespective of their location, have an opportunity to co-create the learning experience on equal terms. The issue is one of providing opportunities for both proximate and online students to engage. It is important not to assume that physical presence is equated with engagement. Nevertheless, it is easier to identify proximate students who are disengaged from the learning process.
3. It is important to avoid using the chat box on Zoom as this creates an inequality between the proximate and the online students even if the chat box is monitored effectively. The danger is that a subgroup, or online clique, develops that might engage in a chat box discussion that is disengaged from the wider group. This is an issue that is not experienced when a module is entirely taught online. The key

> issue is to ensure that all students have the means and motivation to interact directly with one another. This includes breaking down the physical barrier – the screen - between the online students and those in the classroom setting.

Real-time blended learning is very different to blended learning. In real-time blended it is possible that both online and proximate students engage in the learning experience via their laptops. Permitting proximate students to participate directly in Zoom would have reproduced the conditions of a lesson entirely taught online. This concern was behind the decision by the teaching team in consultation with the students not to use the chat function.

Teaching involves communication with students via four possible mediums – text, voice, video and face-to-face. Media richness theory has argued that the quality or richness of the interactions increases as one moves from text to face-to-face encounters (Dennis and Kinney, 1998). It is important for the teaching design to carefully consider the medium mix required to deliver the learning outcomes. In this case, the learning design emphasized the co-creation of the learning experience and this includes encouraging face-to-face and screen-to-face interactions and discouraging voice only (video switched off) and text.

Second, interactions involving group work require careful attention. Groups were formed that mixed proximate with online students to ensure interactions occurred between these two groups. This also provided students with training in a valuable new transferable skill. Many corporate project teams involve working with some team members who are proximate and some who are online, and it is important that students experience this process. Mixing face-to-face and online students encourages active interaction beyond the classroom. This is facilitated by ensuring that online students engage in close communication with a smaller group of face-to-face students. These groups could select which online platform they wanted to adopt to facilitate this exchange. Breakout rooms were available that were separate from

the main lecture theatre. Once a group, had taken up residence in their breakout room then they could use their own equipment to engage with the online students. The groups used Skype for Business, Zoom and Google Meet and typically used a laptop positioned so that all involved in the group could see one another.

Each group had at least one member who was located in the classroom. This meant that the lecturer was able to 'drop-in' physically on any scheduled group meeting to give advice, formative feedback, answer questions, encourage interactions between group members or just to engage in chat. The lecturer could access the online group members via the proximate student(s) interface with the technology platform selected by that group.

Third, the groups were sometimes requested to provide feedback to the whole class. This provided an opportunity for groups to develop their own approach to sharing this task between online students and those based in the classroom. Emphasis was placed on the importance of developing mixed presentations. Some groups pre-recorded their group presentations. This removed the distinction between online and classroom-based students as for a period the whole group appeared to be online. Alternatively, groups delivered their presentations in real-time to the whole class. The recorded presentations could be curated and included as a module resource on Canvas.

Fourth, facilitating a debate across the group is an important part of active learning involving the development of a set of complex transferable skills. Debating between online and classroom-based students is an effective way of ensuring that the class becomes a unified class rather than a class consisting of online and classroom-based students. The technology was important here as it was possible to deploy the camera to frame each classroom-based student as they participated in the discussion. Thus, the classroom-based students temporarily 'joined' the online students and were able to engage in an inclusive discussion in which all

students were included in the co-creation of the learning encounter. The use of the camera in this way added a sense of fun to the learning environment as students were captured on camera and their images projected on the screen.

Communications

Effective teaching is about curating student experiences based on effective communication. Teaching online with proximate students requires the teacher to pay especial attention to the ways in which they engage and communicate with students. The challenge is to avoid inequalities developing between the student experience of those online and those students located in the classroom.

The lecturer always arrived early to set up the classroom including testing the equipment. Face-to-face students drifted into the classroom. These students would chat with the lecturer and vice versa. This could lead to an imbalance between the proximate and online students developing as some students would become better acquainted with the lecturer. This would distort the communication balance between the online and classroom-based students. The following actions were developed to avoid these potential inequalities:

1) Zoom was opened as soon as the lecturer entered the classroom and not when the lesson was scheduled to start. Online students could then 'drift' into the classroom and engage in chat with classroom-based students. It is important that the lecturer engaged in chat with both the online and classroom-based students and encourages communication between all students.
2) The decision was made to use Canvas as the main medium for communication between the teacher and the students. Canvas was equally accessible to all. The curation of the resources on the Canvas platform was an important part of the modules learning design. As important, was curating Canvas to ensure that a clear and

transparent learning roadmap to the module's learning design was provided to students. This included providing details regarding the timing of sessions and the activities needed to be completed.

3) Resources provided on Canvas facilitated active learning encounters. This included using the Canvas discussion forum to address student questions ensuring that the answers were available to all. This was another part of the module's approach to creating inclusive student experiences.
4) A summary of the activities and learning that had been completed each day was uploaded to Canvas as well as details regarding the next day's activities.
5) Ensuring that the discussion forum remained open once the combined face-to-face/online teaching block had concluded. The forum continued until the module assessment process had concluded.

There was an important additional resource that was deployed by the students to enhance social interactions between all students. The students set up an inclusive module WhatsApp group. This was used throughout the block to facilitate group cohesiveness.

Agility or Ambidexterity as a Teaching Paradigm

COVID-19 has highlighted the importance of rapid improvisation in the co-creation of student experiences. Effective teaching is an applied exercise in continual improvisation Sawyer, 2004; Sawyer, 2011a). This process in one in which a lecturer engages in a continual process of 'reading' students in real-time to enhance the student experience by facilitating, encouraging, or deepening student engagement. A creative teacher adapts their approach to teaching to meet the needs of each student cohort that they teach (Sawyer, 2011b). Perhaps the most effective teachers adopt an ambidextrous approach in which they focus on the immediate co-creation of student experiences, but also identify cues which are used to adjust

the ways in which they engage with a student cohort over the course of delivering a module. This is an ambidextrous process based on continual adaptation. The implication is that a module's learning design is adapted as a module is delivered.

The application of the term ambidextrous in this context comes from the literature on ambidextrous organisations. This literature applied this term to corporate executives who must continually look backwards to ensure effective delivery of existing products and processes whilst also gazing forward to explore innovations that might lead to disruptive change (Tushman and O'Reilly, 1996; O'Reilly and Tushman, 2004). This process acknowledges that firms need to balance two diametrically opposing pressures: alignment of current processes and adaptability to future changes. Ambidextrous teaching involves balancing alignment to a module's teaching design with adaptability to meet the needs of a specific student cohort. Teachers must assess their current teaching practices in real-time and then gaze ahead to engage in a continual process of adaptation. This reflects the emphasis placed by Sawyer on good teaching as a process which reflects "the artful balance of structure and improvisation" (2011: 1). Adopting an ambidextrous approach to teaching positions module evaluation as a cross-cutting process that occurs throughout the delivery of a module.

During this module regular feedback was sought from online and classroom-based students. This process of continual feedback was both formal and informal. The informal was a second-by-second process in which adaptation occurred to that which was planned. The formal involved a discussion on Zoom that was held at the end of each day. These were extended days. There is no question that block teaching is an effective delivery mode, but it is also very intensive. This process of continual feedback implies that problems could be identified and resolved before the module concluded. This regular feedback led to adjustments to technology including repositioning the microphone to facilitate more effective

student discussions. One of the adjustments was a request made by the online students to those based in the classroom. This was the suggestion that the more softly spoken students should raise their voices to ensure more effective communication. This request resulted in an alteration in the behaviour of the classroom-based students.

The module concluded with a student discussion regarding the factors and teaching processes that were important in creating an inclusive student experience. The students identified the following as being especially important:

- The mixed face-to-face and online groupwork project teams ensured that the online students considered that they were an integral part of the class. Part of this inclusion process was being able to participate in mini-tutorials provided by the lecturer during the groupwork part of the learning design and which were customised to meet the needs of each group.
- The attention given to regular and consistent communication between the lecturer and all students via Canvas. This was highlighted as being particularly helpful in facilitating an inclusive student experience. The daily summaries were noted as being especially important combined with the approach to chronological curation as the module was delivered.
- The mixed student presentations, and mixed debating formats, were highlighted as creating an equality of experience and one that also broke down the ‘screen’ barrier between the online and classroom-based students.
- The students valued the approach applied to the module based around regular formative feedback. This process was delivered bi-modally in class or in the small group tutorials linked to the support of the group work process.

The summative assessment came in two parts, group work represented 20% of the overall grade and an individual assignment 80%. The group work was an assessed presentation delivered by the real-time blended teams to the class at the end of the module. The content of these presentations was developed by the groups during the duration of the module. The individual assignment was a 2,000 word essay applying the concepts taught in class to practice. An analysis of the assessed grades for each of the two groups of students suggests that there was an equality in the learning experience for both proximate and online students. The proximate students received an average grade of 66.2% with the highest mark being 71% and the lowest 62% and a standard deviation of 3.36, whilst the online students received an average grade of 66.7% with the highest mark being 73% and the lowest 59% and a standard deviation of 3.65. There were no differences identified by gender or other factors, but it is worth noting the small sample size.

The student discussions of the learning experience, classroom observations and the student performance suggest that the approaches adopted to facilitate an inclusive approach to *real-time blended learning produced* an equitable learning experience that did not disadvantage those learning online. In fact, the approach adopted enhanced educational inclusion by enabling equal access to a learning experience for those unable to engage in proximate learning and this includes, for example, students with childcare responsibilities and with disabilities. It also provided training in managing and engaging with groups with co-located and online members. It is worth noting, that group cohesiveness developed during the module. Any possible differences between the online and classroom-based student experiences were reconciled as friendships developed and trust was built between the proximate and online students. The evidence of this cohesiveness comes from classroom observation, but also the outcomes of the group projects which required ongoing interactions

to occur between proximate and online students. Another indication is the management by the students of their own class-based WhatsApp group.

Conclusions

COVID-19 has forced universities into far more flexible ways of working to ensure the provision of an inclusive approach to learning for all students regardless of their circumstances. Many of these new teaching practices should remain with us well beyond the immediate impact of the COVID-19 pandemic precisely because of their positive impacts on inclusion. The evidence that the techniques described in this paper improve inclusion include the feedback provided by the students and their performance on the module.

Teaching online and face-to-face simultaneously is a challenging and tiring experience. Nevertheless, it was also a rewarding experience for both the teacher and the students. The most important aspects of this involves careful attention to the development of an inclusive approach to learning design. This includes emphasis being placed on understanding and facilitating a communication process or a dialogue between all students and with the teacher.

There are at least four types of teaching experience to consider – online, face-to-face or proximate, the hybrid or blended mode in which some sessions are proximate and some online and then the *real-time blended mode* which combines students studying online simultaneously with students engaged in proximate learning. These are very different approaches to learning. The important point is to pay particular attention to communications, encouraging active learning encounters and in continual monitoring of the student experience and adaptation of the learning design. Teaching this new form of real-time blended learning has altered the ways in which we consider teaching. Effective teaching is about the curation of student experiences. This involves the curation of LMS resources to facilitate extensive and intensive student encounters (Bryson and Andres, 2020), but this curation process also

includes teacher-student interactions, student-student interactions, and the configuration of teaching spaces. At the centre of this process is a communication process which provides students with a learning roadmap that acts as a guide to the module's learning design.

Technology is an integral part of a real-time blended module's learning design. Access to equipment might be a problem. The technology that was used to support the delivery of this module was not readily available and a case had to be made for this to be provided. Nevertheless, a communication strategy can be included in a module's teaching design to support integrated real-time blended learning based on available technology.

Geographers appreciate the importance of understanding context and in contextualising place. The design of a classroom or lecture theatre plays an important role in student experiences. This is about the micro-geographies of classroom settings and the role they play in enabling learning. Flexibility is important as different learning designs require different classroom or lecture theatre geographies (Johnson, *et al*., 2020). Teaching spaces tend to be assigned by availability linked to class size rather than by the relationship between a module's learning outcomes, teaching design and classroom specifications. There needs to a debate, and further research, on the complex interrelationships between student and lecturer engagement and the design of learning spaces. Universities have been investing in new teaching space. These spaces can be divided into tiered lecture theatres, Harvard lecture theatres, seminar rooms with some flexibility and laboratories. A key challenge will be developing new teaching space configurations to enhance new approaches to creating student experiences. Part of the challenge will be in developing teaching spaces that incorporate technology that can support simultaneous online and classroom-based learning experiences.

COVID-19 has forced universities to engage in rapid and radical improvisation. It is important that these improvisations continue to inform teaching practice. The future of

teaching is partly online and partly in a classroom setting. The pedagogic challenge is to ensure that the approaches adopted are both inclusive and effective. The primary measure of success is based on enhancing the quality of the student experience. Measuring this is extremely difficult as the student experience is multi-dimensional. Further research is urgently required into the relationship between student experience, inclusion, and attainment. This is especially the case for students who have experienced disruption to their learning from COVID-19. Module evaluations provide a snapshot as does the completion of a degree programme. Perhaps the only measure should be based on the longer-term impacts of a student's educational experience on their lives. One consequence of teaching online and face-to-face at the same time is that it provided students with transferable skills in managing the interface between copresence in place with online team members. This was an unexpected outcome of this form of rapid improvisation, but it is one that all students should experience.

This paper is perhaps focused on a very niche teaching area. We suspect that this approach to teaching will become more commonplace. Blending online with proximate students has been occurring in semester long modules as students were forced to self-isolate. Many of the strategies and techniques developed in this paper can be applied to any module that combines online with proximate students. This approach could be applied to fieldwork with students divided between those online and those in the field. Those online could focus on accessing and exploring online and other forms of resource to support students in the field. These would be very different student experiences. Nevertheless, this type of combined online and field-based analysis perhaps mirrors the ways in which field-based research is increasingly undertaken. This includes combining remote sensing with fieldwork.

We are very aware that this paper is an account of a class of 20 students. An important question is the ability to scale up this approach to a class of 60, 100 or even 400. For larger classes videoconferencing equipment with permanent microphones would be required as

would more than one camera. The learning design for such a module must focus on delivering learning objectives by exploring the mix of communication media available for module delivery. Our experimentation has revealed that learning design, combined with a communication strategy, can ensure equality of the student experience between those online with classroom-based students. This involves making decisions regarding the technology, the design of the classroom and learning design. This involves considerable effort on behalf of the teaching team. It is much easier to teach online or face-to-face. Combining these teaching modes results in challenges that can be overcome. Block teaching requires organisation and advanced preparation as there is no time to develop teaching material whilst the learning design is being enacted. Minor adjustments are all that is possible.

In summary, we have presented our experiences of teaching a module to a group of students who were divided between those who were proximate with the lecturer and those who participated synchronously and remotely. This is the first paper to explore this pedagogical challenge. This challenge included developing an inclusive approach that would attempt to create equitable student experiences. We have identified problems that require adaptations to teaching designs and we have developed and tested these adaptations on one module. We suggest that our experiences apply to teaching and learning during crisis situations including COVID-19, but that our approach to teaching design should inform post-pandemic pedagogy. This paper began by highlighting that COVID-19 is a cultural inflection point that will change the future. It is important that the teaching innovations that have emerged from this period of radical and often disruptive improvisation are not placed to one side once the pandemic has concluded. An active discussion must continue around the role technology can play in enhancing the quality of the student experience and in underpinning the development of an inclusive approach to educational attainment.

References

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies*, 2(2), 113–115. https://doi.org/10.1002/hbe2.191

Birkinshaw, Julian and Gibson, Christina B., (2004), Building an Ambidextrous Organisation. *Advanced Institute of Management Research Paper No. 003*, Available at SSRN: https://ssrn.com/abstract=1306922 or http://dx.doi.org/10.2139/ssrn.1306922

Boling, E. C., Hough, M., Krinsky, H., Saleem, H., & Stevens, M. (2012). Cutting the distance in distance education: Perspectives on what promotes positive, online learning experiences. *Internet and Higher Education*, 15(115), 126. https://doi.org/10.1016/j.iheduc.2011.11.006

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., Olcott, Jr., D., Rodes, V., Aranciaga, I., Bali, M., Alvarez, A. J., Roberts, J., Pazurek, A., Raffaghelli, J. E., Panagiotou, N., de Coëtlogon, P., Shahadu, S., Brown, M., Asino, T. I., Tumwesige, J., Ramírez Reyes, T., Barrios Ipenza, E., Ossiannilsson, E., Bond, M., Belhamel, K., Irvine, V., Sharma, R. C., Adam, T., Janssen, B., Sklyarova, T., Olcott, N., Ambrosino, A., Lazou, C., Mocquet, B., Mano, M., & Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, *15*(1), 1-126

Bryson J.R., & Andres L. (2020). Covid-19 and rapid adoption and improvisation of online teaching: curating resources for extensive versus intensive online learning experiences. *Journal of Geography in Higher Education*, 44:4, 608-623, DOI: 10.1080/03098265.2020.1807478

Carrillo C., & Flores, M. A. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices. *European Journal of Teacher Education*, 43:4, 466-487, DOI: 10.1080/02619768.2020.1821184

Chen, P., Lambert, A., & Guidry, K. (2010). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education, 54*, 1222–1232

Collings, D. A., Gerrard, J.A. and Garrill A., (2019), Shaking up biology—Our experiences teaching cell biology and biochemistry to a first year undergraduate class through the Canterbury (New Zealand) earthquakes. Journal of Biological Education 53 (3):236–49.

Crampton, A., Ragusa, A.T., & Cavanagh, H. (2012). Cross-discipline investigation of the relationship between academic performance and online resource access by distance education students. *Research in Learning Technology*, 20. doi: 10.3402/rlt.v20i0.14430

Day, T. (2015). Academic continuity: Staying true to teaching values and objectives in the face of course interruptions. *Teaching and Learning Inquiry*, 3(1), 75-89.

Day, T., Chang, I. C. C., Chung, C. K. L., Doolittle, W. E., Housel, J., & McDaniel, P. N. (2020). The Immediate Impact of COVID-19 on Postsecondary Teaching and Learning. *The Professional Geographer*, 1-13.

Dennis, A.R. and Kinney, S.T. (1998). Testing Media Richness Theory in the New Media: The Effects of Cues, Feedback, and Task Equivocality. *Information Systems Research*, 9:3, 256-274

Godlewska, A., Beyer,W., Whetstone, S., Schaefli, L., Rose, J., Talan, B., Kamin-Patterson, S., Lamb C., & Forcione M., (2019). Converting a large lecture class to an active blended learning class: why, how, and what we learned. *Journal of Geography in Higher Education*, 43:1, 96-115, DOI: 10.1080/03098265.2019.1570090

Hershkovitz, A., Azran, R., Hardof-Jaffe, S., & Nachmias, R. (2011). Types of online hierarchical repository structures. *The Internet and Higher Education*, 14(2), 107–112. https://doi.org/10.1016/j.iheduc.2010.07.001

Hildebrand, S. (2017). The effective use of communication tools during a long-term campus emergency. *Natural Hazards* 88 (1):21–38.

Ho E.L. & Maddrell A. (2020). Intolerable intersectional burdens: a COVID-19 research agenda for social and cultural geographies. *Social & Cultural Geography,* DOI: 10.1080/14649365.2020.1837215

Horton, R. (2020). *The COVID-19 Catastrophe*. Polity: Oxford

Ilgaz, H., & Gülbahar, Y. (2015). A Snapshot of Online Learners: e-Readiness, e-Satisfaction and Expectations. *International Review of Research in Open and Distributed Learning, 16*(2), 171–187

Jabbar, A., Gauci, C.G., Anstead, C.A. (2021). Parasitology Education Before and After the COVID-19 Pandemic. *Trends in Parasitology* 37(1), 3-6.

Johnson, A.W., Su, M.P., Blackburn M.W. & Finelli C.J. (2020). Instructor use of a flexible classroom to facilitate active learning in undergraduate engineering courses. *European Journal of Engineering Education*, DOI: 10.1080/03043797.2020.1865878

Kuong, H. C. (2014). Enhancing online learning experience: from learnings' perspective. *Procedia – Social and Behavioural Sciences*, 191, 1002–1005. https://doi.org/10.1016/j.sbspro.2015.04.403

Lee, J. J., Srinivasan, S., Trail, T., Lewis, D., & Lopez, S. (2011). Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*, 14(3), 158–163. https://doi.org/10.1016/j.iheduc.2011.04.00

Love, B., Hodge, A., Grandgenett, N., & Swift, A. W. (2014). Student learning and perceptions in a flipped linear algebra course. *International Journal of Mathematical*

Education in Science and Technology, *45* (3), 317–324. https://doi.org/10.1080/0020739X.2013.822582

Mackey, J. , Gilmore, F., Dabner N., Breeze, D. and Buckley P. (2012). Blended learning for academic resilience in times of disaster or crisis. *MERLOT Journal of Online Learning and Teaching* 8 (2):122–35

Montgomery T. (2008). Space matters: Experiences of managing static formal learning spaces. *Active Learning in Higher Education*. 2008;9(2):122-138. doi:10.1177/1469787408090839

Murphy, E., Rodríguez-Manzanares, M. A., & Barbour, M. (2011). Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers. *British Journal of Educational Technology*, 42(4), 583–591. https://doi.org/10.1111/j.1467-8535.2010.01112.x

O'Hara, M. (2007). Strangers in a strange land: Knowing, learning and education for the global knowledge society. *Futures*, 39, 8: 930-941

O'Reilly, C.A. and Tushman, M.L. (2004), The ambidextrous organization'. *Harvard Business Review*, 82, 4: 74-81

Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of literature'. *International Journal of Information Management*, 43, 1–14. https://doi.org/10.1016/j.ijinfomgt.2018.05.005

Pinho, C., Franco, M., & Mendes, L. (2018). Web portals as tools to support information management in higher education institutions: A systematic literature review. *International Journal of Information Management*, 41, 80–92. https://doi.org/10.1016/j.ijinfomgt.2018.04.002

Pittaway, S., & Moss, T. (2014). Initially, we were just names on a computer screen: Designing engagement in online teacher education. *Australian Journal of Teacher Education*, *39*(7), 37–45. doi:10.14221/ajte.2014v39n7.10

Redmond, P., Heffernan, A., Abawi, L., Brown, A., & Henderson, R. (2018). An online engagement framework for higher education. *Online Learning*, 22(1), 183-204.

Rienties, B., & Toetenel, L. (2016). The impact of learning design on student behaviour, satisfaction and performance: A cross-institutional comparison across 151 modules. *Computers in Human Behavior*, 60, 333–34

Sawyer R.K. (2004). Creative Teaching: Collaborative Discussion as Disciplined Improvisation. *Educational Researcher*. 33(2):12-20. doi:10.3102/0013189X033002012

Sawyer, R.K. (Ed.) (2011a). *Structure and Improvisation in Creative Teaching*. Cambridge University Press: Cambridge

Sawyer, R.K. (2011b). What Makes Good Teachers Great? The Artful Balance of Structure and Improvisation', in Sawyer, R.K. (Ed.) (2011a). *Structure and Improvisation in Creative Teaching*. Cambridge University Press: Cambridge, 1-24

Stone, C., & Springer, M. (2019). Interactivity, connectedness and 'teacher-presence': Engaging and retaining students online. *Australian Journal of Adult Learning*, 59(2), 146–169

Tang, T., Abuhmaid, A., Olaimat, M., Oudat, D.M, Aldhaeebi M. & Bamanger E., (2020). Efficiency of flipped classroom with online-based teaching under COVID-19. Interactive Learning Environments, DOI: 10.1080/10494820.2020.1817761

Tushman ML, O'Reilly CA. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review*, 38(4):8-29. doi:10.2307/41165852

Williamson, G. (2020). Students' Return to Universities. Hansard, accessed 23 January, available at https://hansard.parliament.uk/Commons/2020-09-29/debates/780E3096-4E83-4DF8-80AC-6F2F9DBBE5C7/Students%E2%80%99ReturnToUniversities

Žižek, S. (2020). *Pandemic! COVID-19 shakes the world*. Polity.