Trialling HyFlex at TU Dublin – stakeholders' voices and experiences

Frances Boylan
Technological University Dublin, frances.boylan@tudublin.ie

Geraldine Gorham
Technological University Dublin, geraldine.gorham@tudublin.ie

Catherine Gorman
Technological University Dublin, catherine.gorman@tudublin.ie

Jen Harvey
Technological University Dublin, jen.harvey@tudublin.ie

Louise Lynch
Technological University Dublin, louise.lynch@tudublin.ie

See next page for additional authors

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Authors

Frances Boylan, Geraldine Gorham, Catherine Gorman, Jen Harvey, Louise Lynch, Niall Minto, and Ziene Mottiar

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Frances Boylan, Geraldine Gorham, Catherine Gorman,
Jen Harvey, Louise Lynch, Niall Minto, Ziene Mottiar
TU Dublin
frances.boylan@tudublin.ie

Abstract

HyFlex is a multi-modal instructional approach that offers students the opportunity to engage with modules face-to-face and online in a mode that best suits their learning style and situation. Covid-19 forced many universities and lecturers to offer HyFlex opportunities. This emergency flip and required agility to deliver HyFlex provides the opportunity to learn from the experiences of using this mode of teaching and learning. This research presents the results of a survey of 44 lecturers who were part of the HyFlex Community of Practice (COP) or who were employing HyFlex in their practice, and 490 students who engaged with HyFlex at Technological University Dublin (TU Dublin), Ireland. Mini vignettes are used to provide deeper insight. Key findings are that HyFlex was viewed positively by both students and lecturers, and 92% of students would recommend this form of attendance in the future. From a lecturer's perspective, key challenges related to the technology, student engagement and high cognitive load. The research showed that some students who avail of university learning supports preferred the HyFlex approach as it felt that it gave them equal opportunity and allowed them to learn in a way that suited them best. While the majority of students believe that the HyFlex approach resulted in the same level of academic rigour and quality as face-to-face delivery, several lecturers had some concerns. This research is valuable as it positions HyFlex as a feasible form of delivery at a time when a new University Educational Model (UEM) is being developed for TU Dublin. However, it is particularly valuable as it identifies key issues and gives voice to various stakeholders, which is important in terms of

contributing to international and institutional debates and policies going forward regarding the changing pedagogical landscape post-Covid.

Keywords: HyFlex; student experience of Hyflex; lecturer experience of HyFlex; face-to-face and online delivery; student engagement; Community of Practice (COP)

Introduction

'Hybrid-Flexible' (HyFlex) is a multi-modal instructional approach that allows students "to choose whether to attend classes face-to-face or online, synchronously or asynchronously" (SFSU Academic Senate Policy S16-264) from week to week or topic to topic. The approach was first developed by Beatty in 2006/7 with student flexibility in mind, and is built on the following four principles (Beatty, 2019):

1. *Learner choice:* the learner chooses whether they want to experience the learning face-to- face or online. It is this principle that differentiates the HyFlex approach from other multi-modal approaches such as 'blended' and 'hybrid'.

2. *Equivalency*: the learning experience is equivalent no matter which mode the student chooses.

3. *Reusability:* resources resulting from learning activities in each participation mode are reused as learning objects with all students, and

4. *Accessibility:* all students have the technological ability to access all of the resources.
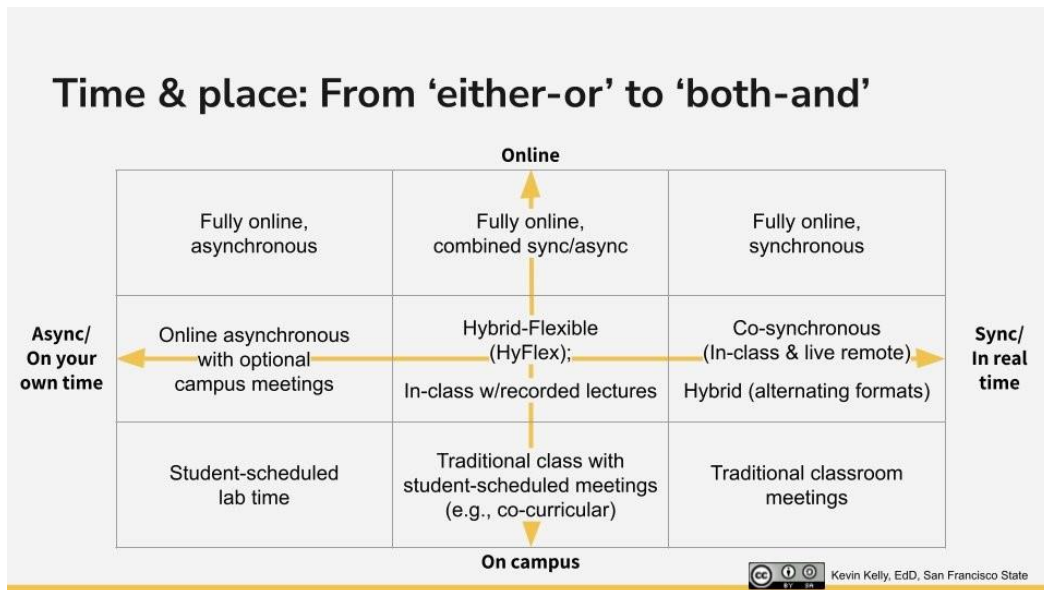
Figure 1 "Time & place: From 'either-or' to both-and' by Kevin Kelly (CC-BY-SA)

Made possible using technology such as cameras, microphones, virtual classroom platforms and virtual learning environments, HyFlex has been offered to students successfully worldwide for almost a decade (Beatty, 2019). Often "the initial impetus for developing a Hybrid-Flexible approach is a very real need to serve both online and on-ground students with a limited set of resources (time, faculty, space)" (Beatty, 2019, unit 3.13), and this was certainly the case in Ireland over the academic year 2021/22. The HyFlex approach gained popularity as higher education providers struggled to comply with Covid-19 social distancing restrictions limiting the number of students that could be physically present on campus at any one time. Lecturers also faced the challenge of supporting students with disabilities, underlying health conditions, caring responsibilities and those isolating with Covid-19, who could not travel to campus. For the purposes of this paper, the terminology employed is HyFlex, however it must be noted that this is not a universally used term to describe the synchronous delivery of lectures to on and off-site students in higher education. Raes (2021, p.139) describes this approach as "hybrid teaching and learning" or "hybridity", while Singh, Steele and Singh (2021, p.141) utilise the phrase "blended and hybrid learning". Furthermore,

Saichaie (2020, p.95) assesses the terms "blended, flipped and hybrid" and suggests that the "interchange of these terms persists across the literature".

At Technological University Dublin (TU Dublin), a small group, comprising Teaching and Learning staff, Heads of Learning Development, Heads & Assistant Heads of School, and interested lecturers, met in early June 2021 to discuss possible alternative teaching and learning approaches for September 2021. Established on January 1st 2019 as Ireland's first Technological University, TU Dublin caters for over 28,000 students offering courses ranging from apprenticeship to PhDs over a wide range of disciplines. A University Educational Model (UEM) was being developed to guide the direction of teaching and learning with modes of delivery included in its remit. September 2021 saw some Covid-19 related restrictions lifted, and it was felt that some physical presence on campuses would be allowed. However, it was also expected that some level of social distancing would also remain in place and that this would mean that not all students on some of the larger programmes would all be able to attend campus in person every day (Department of Further and Higher Education, 2021). It was also acknowledged that a certain percentage of students would not be able to attend campus at all for a variety of reasons, while others would, no doubt, need to isolate at some point during the first semester either with Covid or as a close contact of a Covid patient. This situation posed very real problems for students and lecturers. The HyFlex approach was explored as one possible solution and it was decided that a small trial, involving interested parties, would run over Semester One of the 2021/22 academic year.

This decision was both reactive and proactive. As Beatty (2019) suggested, a need existed to serve students unable to travel to campus. However, there was also an understanding that the pandemic had changed the teaching and learning environment in ways that could never have been predicted, and that educators and managers now had a responsibility to investigate and

research new flexible approaches to teaching and learning (Watermeyer, Crick, Knight & Goodall, 2021; Daniel, 2020; Guppy, Verpoortea, Voud, Liu, Tai & Bartolic, 2021; Kandri, 2020; Clout, 2020; Morgan & Chen, 2021).

This paper presents and discusses the approach taken to HyFlex delivery at TU Dublin during a trial over Semester One of the academic Year 2021/22. Contextual literature and data gathered via surveys sent to lecturers who were part of an associated Community of Practice, and students who experienced HyFlex delivery, are presented below, followed by an analysis and recommendations.

An extensive review of the literature about the HyFlex approach to delivery presented four themes under which that modality is generally discussed: 1) Delivery and approach; 2) Lecturer perspectives of student engagement and the shared learning experience; 3) Perceived challenges of HyFlex; and 4) Perceived rigour and quality of modules. These themes have been used below as headings under which to structure the review of the literature for this paper.

Literature Review

Delivery and Approach

The binary of online and face-to-face delivery of courses is no longer applicable. As Irvine (2020, p.1) noted "on today's higher education campus, there are likely a dozen new terms being used to describe different configurations around the modality of courses". Commonly, the decision about delivery mode is made at the individual module level but Stewart and Bishop (2022, p.18) noted that "there is limited research on how institutions of higher education… have scaled up institutionally". Many institutions worldwide pivoted to both online learning and HyFlex delivery due to Covid-19. However, Ramann et al. (2021)

observed that this emergency response was very different to traditional HyFlex as it often involved an institution telling their students which sessions, they should attend face-to-face and which they should attend online to ensure social distancing: the response did not hold fast to the principle of learner choice of the HyFlex approach. Nevertheless, the impact of Covid-19 has been substantial in terms of opening a discussion about delivery modes and the potential for HyFlex.

Pre Covid-19, Irvine et al. (2013, p.1) reported how students petitioned for their course to be offered online and the authors concluded that the "twenty-first century learners have expectations that are not met within the current model of higher education". According to McCue (2021) "it was anticipated that HyFlex workshops would be offered short term and there would be a return to offering only on-campus workshops", that is, once restrictions had been lifted. However, in many cases, following feedback from the learners, many institutions have decided to provide HyFlex sessions indefinitely. A key driver in the emergence of HyFlex has been, and will continue to be, student demand.

Perceived Benefits and Challenges

There are both benefits and challenges to implementing the HyFlex instructional approach. From the student perspective, flexibility is reported as the key benefit documented. Beatty (2019) explained that a flexible instructional approach supports students who wish to make personal decisions about how best to participate in their chosen programme, giving them more control over their own learning and leading to increased responsibility for learning. A study undertaken by Rhoads (2020) revealed that the ability to choose how to attend a course had a positive impact on his undergraduate subjects' perception of learning and their student experience. They believed that they learned better and were more satisfied when given choice. Greater access to material may be provided by recording synchronous sessions.

According to McKay (2019), the recording of lectures is viewed differently by staff and students, with staff concerned with the definitive 'canonical' characteristic associated with the recorded material, and the student perception that recorded material provides better access. Kohnke and Moorhouse (2021, p.238) undertook a qualitative study of HyFlex delivery on a post-graduate cohort in Hong Kong during Covid-19 and reported that "the students appreciated the flexibility that HyFlex offered, finding that the ability to choose between face-to-face and online instruction provided a sense of safety and control over their learning".

According to Beatty (2019, unit 1.2), lecturers "typically report that their ability to better support students who need alternatives to one-size-fits-all instruction is a highly-valued benefit with HyFlex". However, keeping students engaged both face-to-face and online can be a challenge. Kohnke and Moorhouse (2021) suggested that various tools should be used to increase student engagement including linking students joining remotely with those engaging face-to-face, however this does require time on the part of lecturers to set up and manage. This highlights the challenge of additional time required in both the preparation for, and delivery of, HyFlex classes as well as the issue of class size. Although HyFlex was recognised by Malcyzk (2019) as a method which provides greater student autonomy, he also recognised that it does require more planning and preparation by the lecturer with Detyna et al. (2022) highlighting that delivery using HyFlex is associated with a high cognitive load for lecturers.

Student Engagement and the Learning Experience

Student engagement is viewed as a fundamental aspect of the student learning experience, the creation of this elusive engaging learning environment is sought by academics worldwide (Sinatra, Heddy & Lombardi, 2015). Trowler (2010, p.2) suggested that student engagement

is a "magic wand" for the enhancement of the student experience, the achievement of learning outcomes, and the development of students into successful and productive graduates. The concept of student engagement becomes even more imperative in a HyFlex scenario when academics attempt to simultaneously engage students on campus and online (Detyna et al., 2022).

Research conducted by Heilporn and Lakhal (2021, p. 1) suggested that, at postgraduate level in particular, "HyFlex is a promising course modality" for the development of all aspects of student engagement, behavioural, emotional and cognitive (Fredricks, Blumenfeld & Paris, 2004). However, while Binnewies and Wang (2019, p.290) commented that HyFlex provides "the highest flexibility for student learning", Keshishi (2021) suggested that, during the return to campus in 2021, some students who joined lectures online did not do so out of choice but because of self-isolation restrictions. Therefore, those students were not necessarily 'engaged'.

Some of the elements that generate student satisfaction and engagement with HyFlex delivery include instructor facilitation and support for learning, an acknowledgement of learners' learning styles and learner needs, encompassing both professional and personal situations (Heilporn & Lakhal, 2021). Reflexive questioning (as part of the lecture), journaling, authentic and peer review assessments (Binnewies & Wang, 2019), polls, chat facilities (Miller, Risser & Griffiths, 2013) and playful learning (Keshishi, 2021) are also deemed to support the HyFlex approach. Keiper, White, Carlson and Lupinek (2021, p.343) observed the role of "community building and interaction amongst students" in the development of engagement with HyFlex modules. Engagement is similarly influenced by how student equity and the "academic quality of life" (Shek, Zhu, Li & Dou, 2022, para. 1) are viewed by students, both online and in the classroom.

Academic Rigour and Quality

Academic rigour and quality are cornerstones of higher and third-level education content and delivery. The HyFlex approach requires that the same academic rigour and quality underpins the delivery of a module no matter whether the student chooses to engage and learn via face-to-face, online, synchronous, or asynchronous mode. In their study of teacher training, Wilson and Alexander (2021) found that student grades and learning outcomes were not impacted by their choice of modality. However, some academic faculty leaders remain sceptical about academic rigour and the quality of blended and online courses (Ciabocchi, Ginsberg & Piacciano, 2016), and it is often perceived that cheating is more prevalent with this mode than in traditionally delivered courses (Lanier, 2006; King & Case, 2014). This has contributed to a negative perception of academic rigour and quality learning by some of online/HyFlex delivery.

Prior to Covid-19, Malczyk (2019) evaluated students' perceptions of rigour using different forms of modality including HyFlex. Although numbers were small, it does provide some insight with 11 of the 18 (61%) students saying that they felt the rigour and quality of the online coursework was equal to that of the face-to-face sections. Kyei-Blankson, Godwyll, and Nur-Awaleh (2014) found that students who participate in a HyFlex course show a high level of course satisfaction while as cited by Malyczk (2019), Lakhal, Khechine, and Pascot, (2014) suggested students still perform at the same academic level.

Post Covid-19, in response to a global change in education, Hasan (2022) argued for both internal and external quality assurance systems and flexibility in terms of delivery. In developing a conceptual framework for the taxonomy of higher education delivery modes, Pathek and Palvia (2021) recognised that HyFlex offers a flexible approach providing students with the option to suit their own learning styles. However, they recognised that

issues such as integrity, or rather the perceived lack of, in the case of online courses, has slowed the pace of adoption of online as a mode of delivery. As Landin and Pacenka (2021, p.13) stated, there is the "imperative of academic rigour and the consideration of the quality of the learning environments". While academic rigour and quality are key, many academics recognise that resources are also fundamental to quality delivery. While researching the preparedness of faculty for HyFlex delivery, Romero-Hall and Ripine (2021) found that quality of learning was often down to the availability of resources, and that lack of access to technology was one of the main concerns contributing to the lack of quality of the learning experience for those who joined HyFlex online. Whilst using HyFlex is recognised as more complex, strategic planning and appropriateness of use (i.e. in relation to discipline and student requirement) need to be addressed to ensure an effective and efficient approach to delivery going forward.

The HyFlex Trial

Over the summer period 2021, a small number of rooms across TU Dublin were equipped with fixed cameras and/or ceiling mounted cameras and mics. PC monitors with built-in webcams were rolled out in smaller teaching spaces. It was acknowledged that for other teaching spaces, lecturers would have to bring technology such as laptops, iPads, drawing tablets, phones and headsets with them as required.

In early October 2021, an email was issued to all lecturers explaining what the HyFlex teaching approach involved and calling on interested volunteers to join the growing HyFlex Community of Practice (CoP). They were also asked to consider implementing the HyFlex approach for at least a few classes over semester one with a view to feeding back their experiences to community members. Within a few weeks the CoP had grown, and

membership stands at 130 members at the time of writing. It was decided to use this trial period to gather valuable data and to make recommendations to the university around embedding this approach in teaching practices going forward.

Rather than issuing a standard/rigid workflow that focused on the use of certain technologies that must be followed by lecturers when delivering a HyFlex class, it was seen instead as more valuable to encourage creativity and innovation and to allow a mix of different possible approaches to HyFlex delivery to emerge from the trial. To support lecturers in designing a HyFlex setup that suited their own needs and those of their students, and the different teaching spaces that they were timetabled for, the CoP collaborated on the development of an extensive guide that outlined eight sample classroom scenarios and 14 different tech setups, ranging from low tech to high tech, to spark some ideas and provide some guidance. This guide also included some tips and hints on how to actively engage students during class.

Research Methodology

The HyFlex CoP received ethics approval in January 2022 from TU Dublin's Research Ethics and Integrity Committee to disseminate two anonymous online surveys, by the end of that month, asking for feedback on lecturer and student experiences of the HyFlex approach over Semester One. The lecturer survey consisted of 25 core questions with branching options, and the student survey consisted of 22 questions. A copy of the survey is available upon request.

Surveys are a flexible approach to data collection that is both quantitative and qualitative in nature, and which relies on the use of self-report measures (Price et al., 2015). Surveys were deemed the most appropriate data collection method for the purposes of this research. A mix of branched closed and open-ended questions were employed. The closed questions were reserved for gathering factual data where only a small number of possible answers were

available to the respondent. Open-ended questions made up most of the question types in both surveys (lecturer and student) and the questions asked were informed by literature on the HyFlex approach. Open-ended questions provide unbiased answers because respondents are not provided with options that indicate what the researcher is looking for, and the data gathered via this question type is seen as more valid and reliable (Price et al., 2015).

The invitation to participate and respond to the lecturer survey was disseminated by email to members of the CoP only, and they were asked to forward on the request to any colleagues who were not members of the CoP but who were also utilising the HyFlex approach to delivery. The invitation to participate and respond to the student survey was disseminated by email to all students at TU Dublin. Consent for the use of the survey data was gathered through the first required question of each survey. Participating lecturers or students who did not give consent via that first required question were not able to continue with the survey. Both surveys were open for responses for two weeks following the semester one exam period.

Forty-five responses were gathered from lecturers, 44 of whom agreed to their anonymous data being used. More than 1200 students responded to the survey. Of those, 490 had experienced HyFlex and agreed to their anonymous data being used. The themes used above as headings under which to structure the review of the literature for this paper were also used as the themes under which the qualitative data gathered was analysed. Any data gathered that fell outside of these themes has not been reported in this paper.

A key part in the HyFlex trial, and the CoP, was to learn from experiences and the survey data presented here represents an element of this, but in addition we have presented mini vignettes which are the professional experiences from a variety of perspectives. This follows the trend of using such an approach in educational research over the last 50 years (Jeffines &

Maeder, 2005) and the main aim is to "elicit information through inviting responses, encouraging discussions, and probing for understandings to gain insights" (Skilling & Stylianide, 2019, p. 541). These are salient as they reflect the fact that "the importance of reflection and reflective practice is well acknowledged in teaching" (Tay et al., 2009, p.1) and including these mini vignettes provides additional insights which supplements the quantitative approach. The mini vignettes include reflections from the authors' individual experiences which emerged from their discussion and analysis of the process and identification of common themes which were then represented in the lecturer A-D mini vignettes. In addition, the team invited a programme team chair, learning support officer and member of the University Educational Model team to reflect on their own specific perspectives. They were selected as, following analysis of the data, it was clear that emerging themes included the unique experience of students who require additional supports, the role of the institution, and the fact that while most HyFlex strategies were devised and implemented at the module level there was also the experience of a programme-led strategy which could provide insights. As such, these mini vignettes enrich the data that has been collected via the survey.

HyFlex Teaching and Learning at TU Dublin: Lecturer Feedback

Delivery and Approach

Lecturers gave a mix of reasons as to why they started implementing the HyFlex approach. The most obvious reason was that they wanted to provide choice and/or flexibility for their students so that they would not fall behind in their studies when ill or unable to make the long commute in the face of reduced capacity on public transport and changed responsibilities at home or at work. One respondent observed that they felt "A genuine interest at first in the

process but then necessity due to Covid restrictions" (L(Lecturer) 44) and another "I think it made me more flexible as a teacher and I wouldn't mind to keep adopting that approach" (L39). However, some lecturers also embraced this approach for more personal, professional and/or strategic reasons: "I am interested in widening access to education and provid[ing] flexibility, particularly for postgraduate students" (L42) and "I had built up skills and didn't want to lose them. It was also insurance against future lockdowns" (L23). As shown in Figure 2, HyFlex was used across all levels from first year to postgraduate.
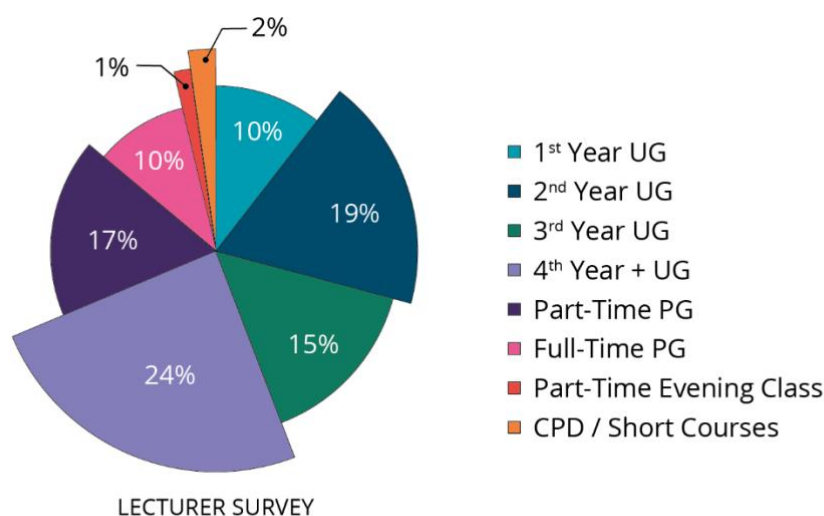
Figure 2 Cohorts and years in which lecturer respondents
delivered using the HyFlex approach

Feedback showed that lecturers utilised a mix of different technologies to deliver their HyFlex classes. Most of the respondents managed with the PC at the podium (75% (n=33). 16% (n=7) also used drawing tablets as another display input while a further 5% (n=2) reported utilising a visualiser (document camera). Two lecturers (5%) used a Swivl Robot to follow their movements around the room and to provide those joining remotely with enhanced audio from the floor. As noted in Mini Vignette 1 below, being an early adopter generally of technology was a help for some in terms of shifting to HyFlex.

Most lecturers used either Bongo Virtual Classroom or MS Teams to stream to students joining remotely. Hanging mics were used where available but 18% (n=8) brought wireless/Bluetooth headsets with them (mostly personal devices) to allow them to move away from the podium mic while still providing adequate audio for the students joining remotely, with a further two lecturers (5%) using an amplifier and an external mic. 13% (n=6) used their personal phone in conjunction with the wireless/ Bluetooth headsets either to provide clear audio for remote students, or as another display input.

> "In general, I would be an early adopter of innovative technology or techniques, so trialling Hyflex appealed to me, couple this with being driven to find workable solutions to dealing with students who were ill or close contacts. There were some techniques I had trialled last year online that I wanted to continue to utilise in the classroom."

Mini Vignette 1 Lecturer A Perspective

42% (n=18) indicated that that the technology was not readily available in the timetabled classroom with some campuses not equipped to deliver using such an approach: "Unfortunately, most classrooms in Bolton St. are not equipped for HyFlex" (L50). Most of the lecturers gave students the option to choose mode of attendance (57% (n=24)). In many cases the students did not provide a reason for joining online (46% (n=19)), and 25% (n=11) of the lecturers indicated that no reason for the students joining online was provided, nor was it sought.

As shown in Figure 3, in many cohorts students experienced both online and in person sessions, the exception to this was in the case of Springboard (an up-skilling initiative) where delivery was all online. The ratio between in-person and online attendance changed over the semester in the case of 56% (n=24) of the modules. Many lecturer responses indicated that students tended to attend online more towards the latter part of module delivery: "More students start[ed] wanting on-line delivery when they saw it was an option"(L49) and "More

people choose not to come in to lectures and attend in-person as the semester progressed"

(L11).
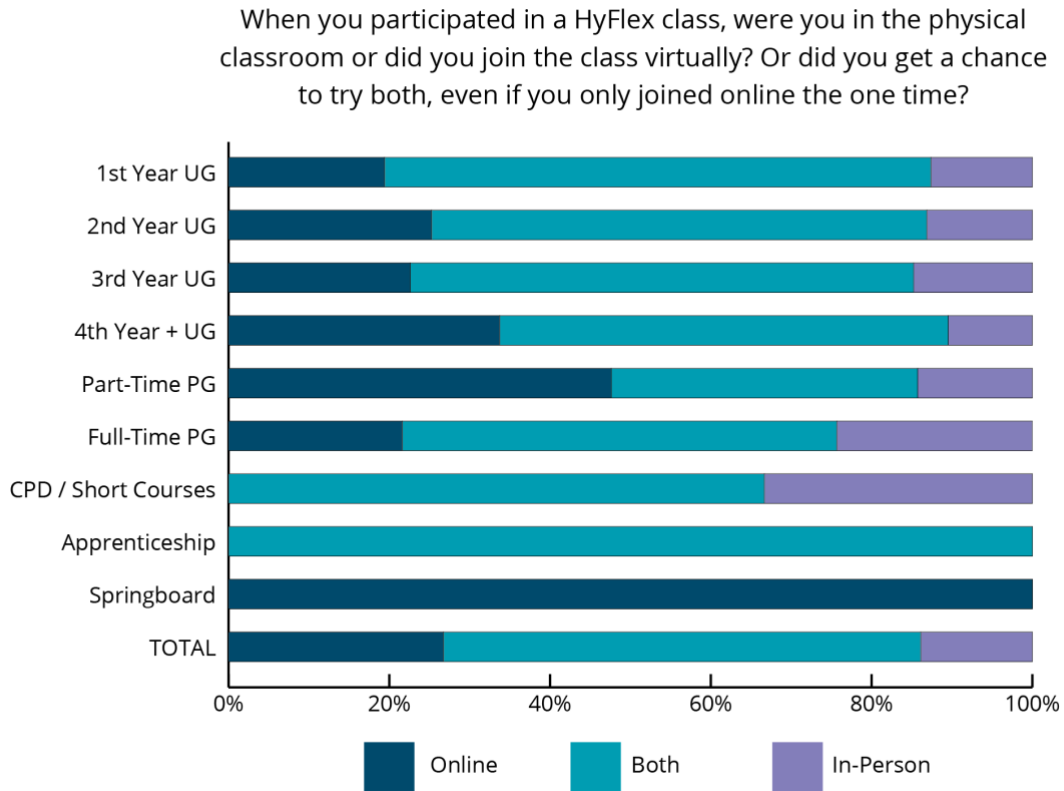
Figure 3 Reported Mode of Attendance (Student)

In most cases it was individual lecturers who made decisions about employing the HyFlex

approach on individual modules, but, in one case, this decision was taken collectively by a

programme team. Their experience is outlined below in Mini Vignette 2.

"In September 2021, a programme wide HyFlex approach was implemented on the Masters in Digital Marketing. A major contributing factor to this development was the buy-in from the Head of School and the full teaching team. All face-to-face classes were streamed live but not recorded. It was agreed in advance of the academic year that classes would not be recorded as this might lead to students not attending and watching the classes later. This would remove the critical need to engage with students.

The technology implementation was somewhat eclectic across the teaching team. Some lecturers used the classroom podium PC with its camera and mic, others used laptops and, in one case, a Swivl robot that followed the lecturer and an iPad Pro to project a virtual whiteboard to the online and classroom participants were used.

The programme experienced the usual issues with failing technology, sound quality between online and offline students, and online engagement. However, the teaching team remain committed to providing this flexible and multi-modal learning environment with the proviso that the technology issues are addressed and that operating HyFlex in the classroom becomes more seamless. It was clear from the student experience that HyFlex enabled them to balance their lives and, in some cases, was the key enabler in their continued participation on the fulltime programme. In the future, the full support of all stakeholders and the seamless integration of HyFlex technology into the classroom are key factors for consideration when implementing HyFlex across a full programme."

Mini Vignette 2 Programme Teaching Team Experience

Lecturer Perceptions of Student Engagement and the Shared Learning Experience

Consideration of student engagement is fundamental to the trialling and ongoing use of HyFlex by many academics. When asked why they chose to use this method 77% (n=32) of lecturers referred to wanting to counteract the reasons why students could not attend lectures such as ill health, being a Covid close contact, commuting time or work commitments. Thus, HyFlex was seen as a way of encouraging student attendance and engagement at lectures. As one respondent noted "My student engagement soared to nearly 100% - almost unheard of in face-to-face only days. The flexibility meant there was no excuse for a student to miss classes and the engagement tracking meant no way to miss disengaging students" (L29).

However, engagement involves more than just attendance at lectures and when asked an open question regarding the biggest challenge in operating a HyFlex model, after 'technology', the next most common response related to learner engagement and the difficulty of engaging with both the face-to-face and remote cohorts at the same time. The key issue mentioned was

the difficulty of getting interaction from those online. One lecturer (L34) commented that it resulted in a "higher mental load for me as not all techniques for engagement are suitable for both audiences at the same time". The pragmatic nature of Hyflex, allowing greater attendance at lectures, was seen to be a benefit, but as one respondent (L22) commented it "undermined class collegiality and the scope for group learning".

Most lecturers did not provide online collaborative activities (40% (n=17)), and when commenting on the reason why, 24% (n=10) mentioned the issue of time. They also commented on the lack of technology "Technology was not available to link both student cohorts", and resources, "I wouldn't have the resources to manage breakout rooms" (L51).

Just over 60% (n=26) of the lecturers thought that the HyFlex approach to delivery had a positive impact on the students' learning experience with only 25% (n=11) citing that there was neutral impact or no change. Comments ranged from the positive "It allowed some students to attend who wouldn't have otherwise been able to" (L49), "I think the students get the best of both worlds" (L48), to the more neutral "It is a facility, neither better nor worse overall" (L20). Some lecturers felt that HyFlex might benefit stronger students and disadvantage weaker students with poorer self-management skills and increase the language barrier for international students.

Overall, it is apparent that offering HyFlex facilitated greater student attendance, but the creation of engagement among the online cohort was challenging for academics.

Perceived Challenges of HyFlex

Several challenges were identified by lecturers, and these included managing the technology, the requirement to multi-task, and the associated cognitive load (see Mini Vignette 3 below), balancing the approach providing equal delivery and engagement between online students and those face-to- face. Comments from lecturers included: "Getting the equipment to work

as expected" (L48), and "Monitoring online chat while also trying to lecture at the same time" (L51). One respondent felt "It damaged my focus as a lecturer and managing various technology around making sure the student remained engaged distracted my train of delivery somewhat" (L44).

> "One of the biggest challenges of HyFlex is the high cognitive load. As a lecturer I had to be aware of my content, engaging students in the room and those online, and deal with the technology. I found it challenging to ensure equivalence for all learners. To do this I used breakout rooms, the chat box, online tools and modified activities. This is a whole new way of teaching that is rewarding but does require re-thinking about every element of the session."

Mini Vignette 3 Lecturer B Perspective

Lecturer feedback about the support received from the HyFlex CoP was positive, with specific reference to the guest speakers and the practical presentations from community members. In general, they found the overall lack of resources (technology, personnel, training, and time) a barrier to fully engaging with the HyFlex approach and really embracing its potential benefits. For example, one person observed "I think if the technology was there, and the training was given to staff more people would embrace it. People are afraid of it and are hesitant to change to this mode of delivery". (L10). Another commented "The preparation and thinking time required for the technology set up for this approach" (L42).

The need to have colleagues, particularly IT support staff, on hand to help was also noted: "Have equipment in working order and IT support available to call from classroom in case of any issues. If we are to be a well-regarded technological university, we need to be supported appropriately" (L35). Lecturers also found the creation of meaningful interaction with, and engagement among, the online cohort challenging.

Nevertheless, while 77% (n=33) of lecturers felt that using a HyFlex approach is a practical necessity right now, 23% (n=10) indicated that it enhanced teaching and learning and was

well received by students. "It has been a huge winner with the students who have asked for it to be practised elsewhere" (L29, also see Mini Vignette 4). One lecturer felt "As an alternative to fully remote teaching, HyFlex recreates the classroom environment which energises both me and the students, and encourages more participation engagement" (L9). Another commented "It has provided addition channels of learning allowing for greater student diversity. I can now offer programmes to those not able to physically attend each week. Potentially the best of both worlds" (L23) and a further lecturer noted "It forced me to plan out the structure of the lessons more carefully…" (L44).

> "I was motivated to offer Hyflex by a reluctance to revert completely to the pre-Covid approach to lectures and lose all the new knowledge acquired during the year of online delivery. Also, as a programme chair, I was cognisant of cases where students might be excluded from lectures due to Covid or other health concerns. The main challenges for me were technical, a lack of sound and the updating of the firewall which prevented access, but I liaised with computer services to resolve these problems. Anonymous feedback was sought mid-way and at the end of each semester. In the main this student feedback was positive. I was conscious that my use of HyFlex motivated students to request other lecturers to adopt this approach. I was mindful that some lecturers felt pressurised and did not feel comfortable or agree with the use of HyFlex."

Mini Vignette 4 Lecturer C Perspective

Perceived Rigour and Quality of Modules

18% (n=6) of lecturers indicated that they had made no change to their teaching approach while others adopted new strategies to engage their students. Just over half of the respondents (54% (n=23)) thought that the academic rigour and quality of their module was equal to face-to-face delivery with comments ranging from the positive "I would not have continued with it if I felt the rigour and quality was lower using HyFlex!" (L13), "the quality of my teaching in a Hy-flex setting was better than the quality of my teaching from home", to the neutral "The mode of delivery doesn't impact the rigour and quality of the modules" (L49) to the negative "On-line students sometimes feel ignored (delay in reading text chat)" (L52). Sometimes a

caveat clause was included such as "There was no reduction to the rigour but more work was required on the side of the lecturer... and that with appropriate technology and technical support, it is a viable alternative" (L52). The majority of students (77%) believed that the rigour and quality of the HyFlex modules equated that of the face-to-face delivery as demonstrated in Figure 4.
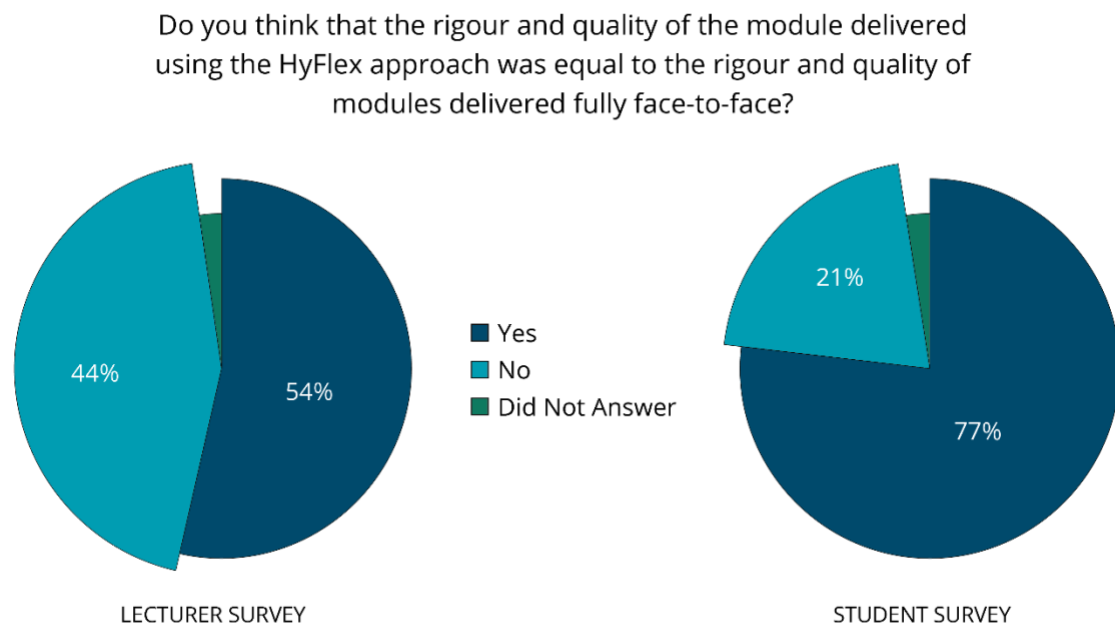

**Figure 4** Perceived Rigour and Quality of HyFlex modules

Student Feedback

Student feedback was positive with 83% of respondents feeling that the HyFlex experience was 'Good' (35%) or 'Excellent' (48%), and as shown in Figure 6, there are no significant differences across most cohorts, although it is notable that the apprenticeship and Springboard respondents have a greater divergence of views. It should be noted that, as shown in Figure 5, these cohorts had a low representation in the survey (i.e. 2-3 responses). 73% said that they attended in both a face-to-face and online setting during the semester. Only 7% said they only attended face-to-face classes. While the impact of Covid-19 and quarantine will have affected the uptake of online classes, such a positive uptake would

suggest students want an option to attend class online or face-to-face independently of Covid or Covid restrictions. One student commented, "At this point I wouldn't even consider going back into the campus, wild horses couldn't return me to that way of life. It's had a profound positive effect on my mental health" (student 2).
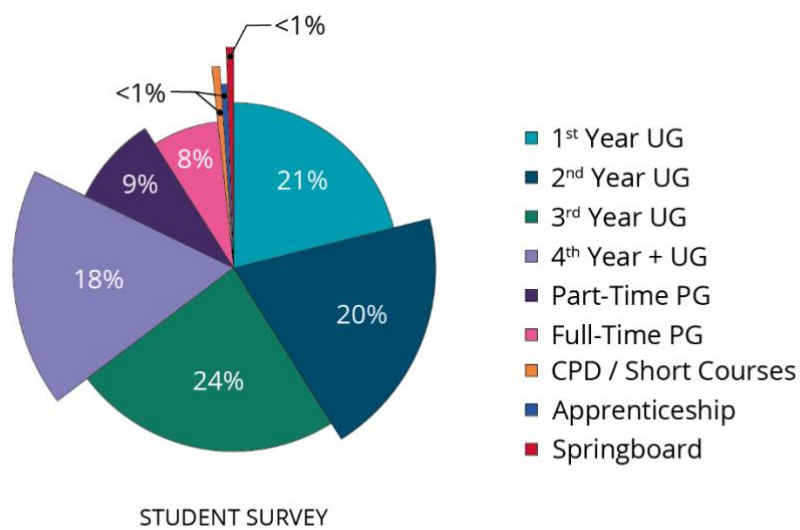

Figure 5 Cohorts and years of student respondents who attended HyFlex classes

How would you rate your experience of the HyFlex approach to class delivery?
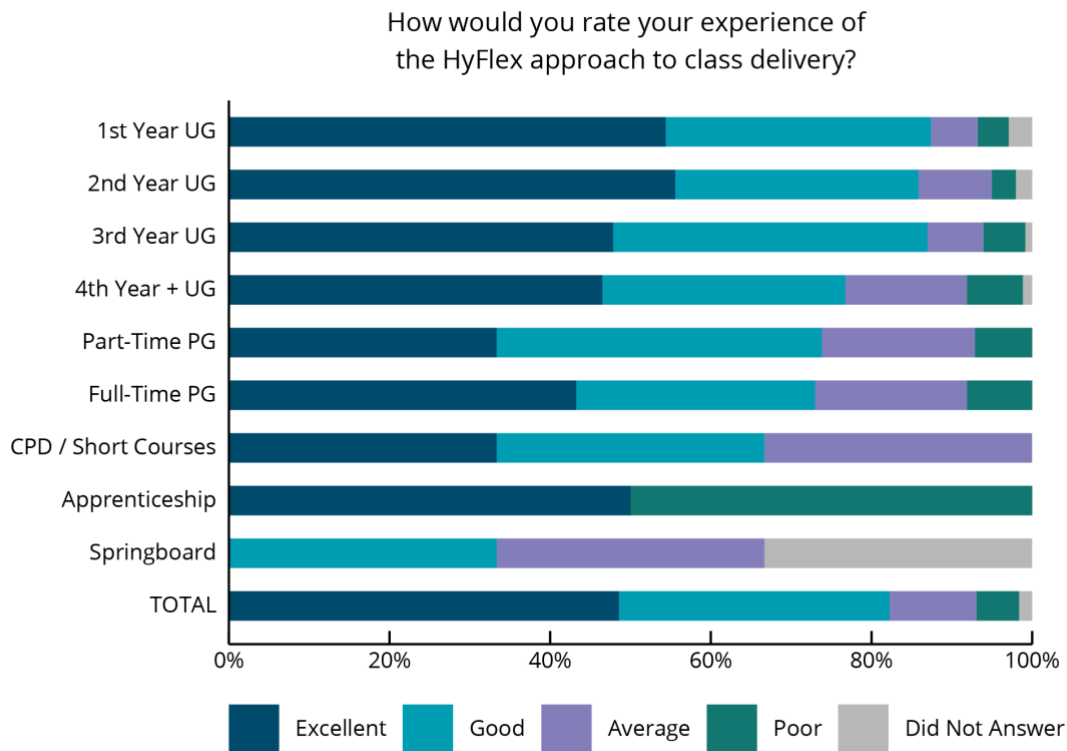
Figure 6 Student HyFlex Experience Ratings

While 92% of students would recommend a flexible attendance model to other students (Figure 7), the narrative from the survey would suggest that living a distance from the campus, travel costs, health, general flexibility and inclusiveness are all factors in support of flexible attendance, such as that offered by the HyFlex model. Flexibility and long commutes were the more frequently recurring themes, and one student also mentioned that they became more tech savvy while participating online, which was an unexpected, but welcome, consequence. There were also impacts upon mental wellbeing: for example, "The remote learning has improved my grades, I used to be exhausted after work, trek to college, sometimes fell asleep in class, I wasn't alone!" (S2) and from another student "HyFlex allows for a better work life balance by cutting the commute time and lets me deal with my personal responsibilities...in a better way." (S493). It is notable that those completing Apprenticeships were more reluctant, as a cohort, to recommend HyFlex.
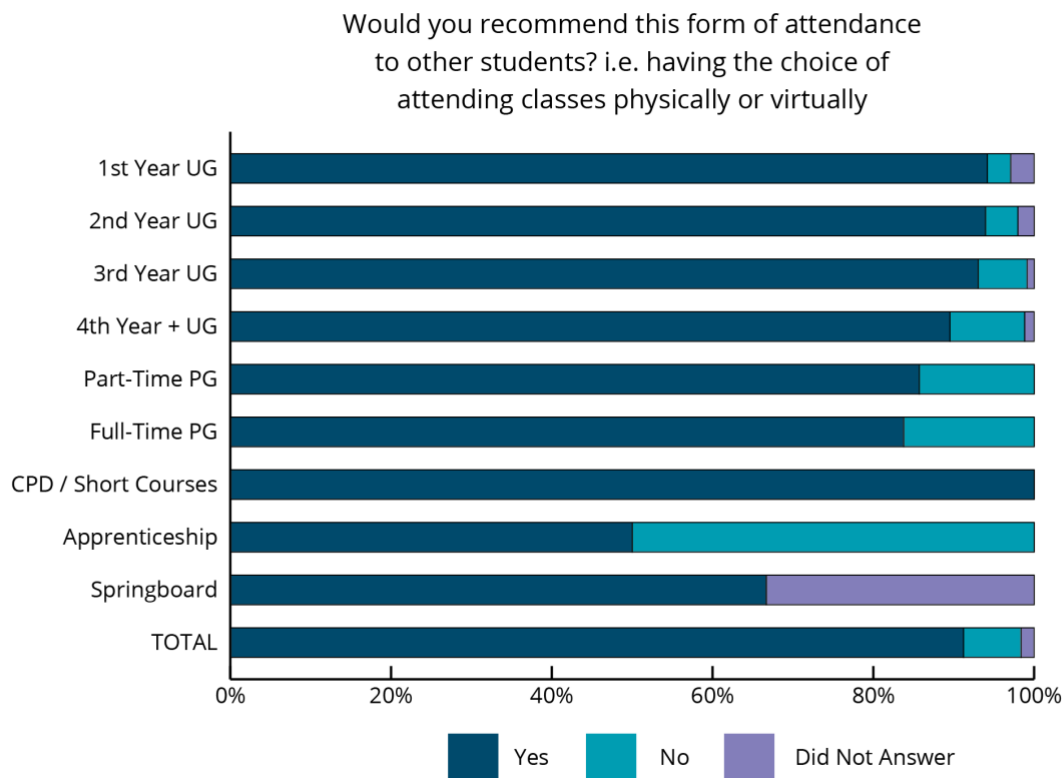
Figure 7 Students recommend HyFlex

Students who self-reported disabilities also recommended the HyFlex approach saying it had provided them with equal opportunities and enhanced their overall learning experience: "As someone who has loved academia and learning, who also suffers with "ADD" ... nothing has been more empowering than having an environment in which I can self-supervise" (S6), and "I have ADHD and, in my experience, people with neurodiverse brains learn better in their own pace, in their own safe environment …. (Hybrid teaching) is a sudden equal opportunity that allowed me to have distinction in all my classes but one" (S493). These views are echoed in Mini Vignette 5 below contributed by a Learning Support Officer who works with students registered with Disability Support Services at TU Dublin, City Campus.

"We are a HEI with a high number of students, supporting students with disabilities with an increase in neurodiversity and sensory disabilities alongside a variety of other disabilities. In anticipation of the return to campus, some students have asked if it would be possible for them to attend the on-campus lectures virtually. The reason being, their disability may impact upon attendance to College but they are able to attend online. Also, some of our students are hospitalised during the semester and as lectures were delivered online for the last two years, they have been able to watch the recorded classes without falling behind too much.

In view of these situations, the shift to online learning for the last couple of years seemed to have worked well for some of our service's students as it has offered flexibility of accessing the curriculum as outlined. Furthermore, neurodiverse students including those with AD(H)D reported being able to remain focused during online lectures as they moved around their room at home. They are unable to do this during on-campus lectures as the teaching / learning environment does not facilitate movement during a lecture. The learning environment is key and in this sense, some students created their own study rooms at home which provide a conducive sensory environment for learning whilst studying and attending online lectures, etc."

Mini Vignette 5 Learning Support Officer Insight

While there is clear support from students for the continuation of a HyFlex model, key issues were raised. The first being 'technology' with students concerned about their broadband, especially those living outside urban areas. There were also mixed observations regarding the 'effectiveness' of online teaching and learning with some students stating that they lost focus when they were not in a physical classroom and who felt they did not have the same level of 'interaction' with their lecturers when online. Equally, others felt that being online meant they had fewer distractions. Further development of the HyFlex model is needed to ensure online students are engaged in the class and maintain their focus.

Online Versus Face-to-Face Learning
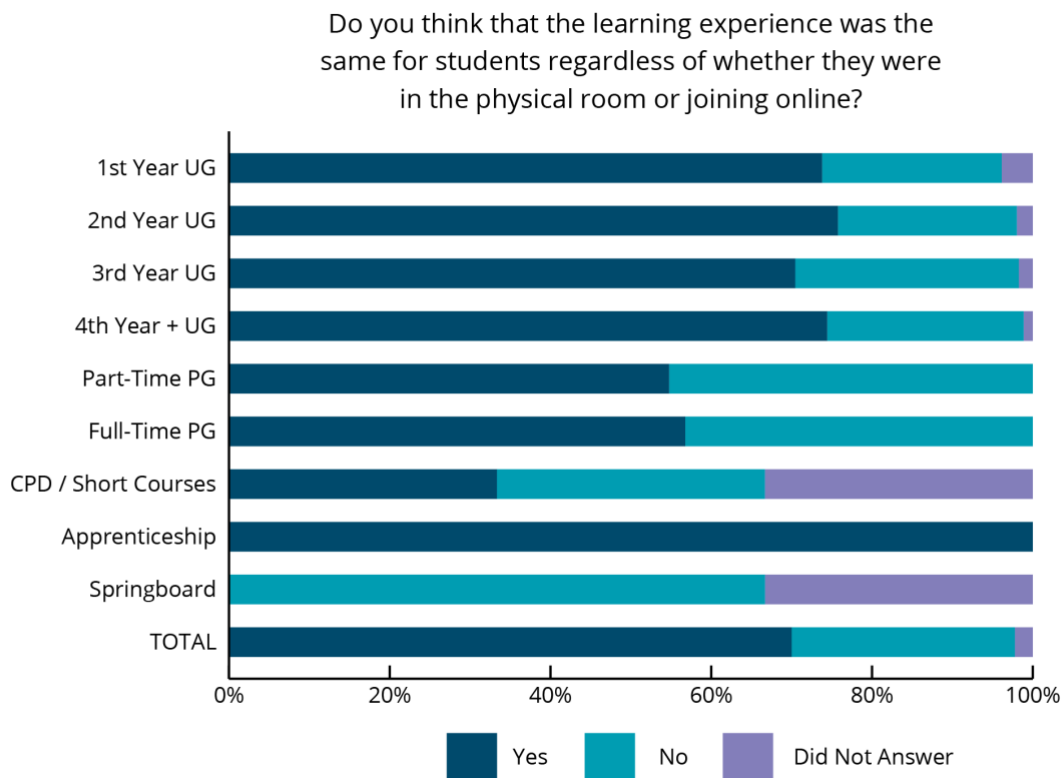
Figure 8 Online Versus Face-to-Face Learning (student perspective)

As shown in Figure 8, overall, 70% of students believed that the mode of delivery did not impact upon their experience. However, postgraduates expressed a wider range of opinions with 44% percent feeling the online experience was different to that of being face-to-face (as compared to just 24% of undergraduates). One student suggested "the best solution is having theory classes online in some shape or form and practical labs on campus" (S931). Effective strategies were important in ensuring the equality of the experience, as one respondent said "the lecturer I had was good at keeping the online students just as engaged as the students attending in person. It didn't feel like you were less a part of the class compared to the students in the physical rooms" (S1126). Mini Vignette 6 below shows the focus on this issue by some lecturers.

> "It is mandatory that the students on my module attend peer delivered workshops. HyFlex was used to facilitate students who could not attend due to illness. The use of a variety of apps allowed students off-site to join in, present and engage via their phones and laptops. The only challenge was the difficulty in providing the opportunity to engage with some in-class activities/exercises. It was found that the class were supportive that their peers were included and got the best possible chance of being part of the workshops."

Mini Vignette 6 Lecturer D Perspective

Discussion and Conclusion

This paper details the extensive evaluation of a trial of HyFlex delivery which took place in TU Dublin during Semester One of the academic year 2021/22. The impetus for this trial was the then ongoing Covid-19 restrictions in the country which impacted delivery to students in higher education. Academics used HyFlex to facilitate students' learning, reflecting Beatty's (2019, unit 1.2) assertion that lecturers use HyFlex to "better support students". However, as evidenced by the data and mini vignettes, presented earlier in this paper, several different variants of HyFlex were offered during this trial with varying levels of student choice provided. This echoes Ramann et al.'s (2021) and Keshishi's (2021) observations that this form of emergency response HyFlex was quite different to traditional HyFlex. Albeit these findings are related to a particular point in time, they are important as the teaching and learning landscape has changed significantly, and perhaps irreversibly. The learning from this experience is invaluable as individual lecturers, programmes and institutions make decisions about future modes of delivery.

From a TU Dublin perspective, Hyflex may be a key element in the achievement of the strategic intent of the university (which is underpinned by the 2015 UN Sustainable Development goals) by providing inclusive and equitable high-quality education and promoting lifelong learning opportunities and a transformative education experience.

Furthermore, the new University Educational Model proposes a multi-modal approach to learning (see Mini Vignette 7). Thus, the undertaking of this trial and analysis of the experiences from different perspectives is highly informative and timely. It is notable that several students, who are in receipt of additional learning support, found that the HyFlex experience better suited their learning needs and as such provided what they termed a more equitable educational experience. Similarly, some students who were juggling home, work and study acknowledged the immense benefits of Hyflex. This aforementioned student feedback reiterates the findings of Heilporn and Lakhal (2021). Another key element in this discussion is that of equal opportunity and the ability of HyFlex to allow a diverse student body to address their own learning needs (Pathek & Palvia, 2021). Covid-19 has broadened the discussion of inclusivity, equal opportunity of access to, and the student experience of, education, and the HyFlex approach can contribute to the realisation of these aspirations. This is illustrated in the following mini vignette, drafted by a member of the University Educational Model Team, and delineates the University's view on the potential of HyFlex.

> "Multi-modality, often referred to as 'Hyflex' will be required to enhance the learner experience and brings many benefits for individuals, HEIs and wider society, particularly in terms of equity, employability, and efficiency in the management of resources. This approach will engage learners from across society to deliver skills, knowledge, and sustainability competencies through a human-centred, digitally supported infrastructure which transforms learning and teaching."

Mini Vignette 7 University Educational Model Team Perspective

It is important to note that there is not conformity of experience among students. While Heliporn and Lackhal (2021) identified the potential of HyFlex for postgraduate students, it is notable that in this study postgraduate students believed that the student experience was different depending on their chosen mode of attendance. It is also evident that respondents

completing apprenticeship programmes were more reluctant to recommend HyFlex than other student cohorts.

Overall, students conveyed a very positive response to the HyFlex experience, with 92% recommending this choice of attendance going forward. There was a more cautious response among lecturers, 47% said that they would continue to employ HyFlex delivery in the aftermath of Covid-19 restrictions and a further 47% said that they *may* continue to use HyFlex.

Despite the generally positive evaluation of the experience, several challenges were mentioned by lecturers with 'student engagement', 'dealing with the technology', and 'high cognitive load' being specifically highlighted. From a lecturer perspective, it is apparent that the continued use of HyFlex requires investment on the part of the university, including IT resources and support, time allowances, training (technical and pedagogical), and the possible availability of Teaching Assistants echoing Romero-Ripine's (2021) observation that resources are necessary for the creation of a HyFlex quality learning experience.

Based on the findings, there is a justification to interrogate the academic rigour and quality associated with HyFlex delivery. Prior to Covid-19, online delivery was perceived by many to be less rigorous than traditional face-to-face courses (Lanier, 2006; King & Case, 2014; Ciabocchi, Ginsberg & Piacciano, 2016). In terms of delivery during this trial, 82% of the lecturers indicated that they adopted new strategies to engage students. It is key that academic rigour and quality is maintained despite changes made. It should be noted that although 54% of the lecturer respondents thought that the academic rigour and quality was equal to that of face-to-face delivery, 44% of lecturers indicated that it was less. A high majority (77%) of the students surveyed thought that the academic rigour and quality was equal to that of face-

to-face delivery, which is higher than the findings (61%) from a smaller cohort evaluated by Malczyk (2019).

The recording of lectures is an area considered for future research, as this is a critical component of true HyFlex delivery allowing for both asynchronous and supplementary student learning (Clemmer & Vale, 2021). Access, or indeed limiting choice of access to the lecture by not recording is indicated by Mini Vignette 2. McKay (2019) refers to unique cultures and contexts associated with higher learning and the transformed learning spaces provided by digital technology, thus eliciting a discourse which could provide the direction for further research including such issues as recording and on HyFlex delivery in TU Dublin.

Covid-19 created a scenario where many new teaching and learning tools have been trialled and HyFlex is a perfect example of this. The experience of this in TU Dublin indicates further opportunities to offer programmes and modules using this mode of delivery. However, it is clear that there is a need for an institutional policy to guide and support the development of HyFlex and to build on the work commenced by the individual lecturers or early adopters in this trial. Key to this will be the need for appropriate and adequate supports to address the aforementioned concerns about academic rigour and quality of the teaching and learning experience.

Beyond TU Dublin this research is valuable as it incorporates the voices of key stakeholders and discusses their experiences of HyFlex. This paper includes extensive data relating to both student and lecturer experiences of the positives and challenges of teaching and learning in a HyFlex environment. As the educational landscape has changed, and mode of delivery in higher education has become a topic of debate internationally, it is imperative that studies like this inform policy formation and ensure lived experiences are incorporated into the discussion.

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