Remote learning in the context of COVID-19: reviewing the effectiveness of synchronous online delivery

Gavin Baxter and Thomas Hainey
*Department of Computing, Engineering and Physical Sciences,
University of the West of Scotland–Paisley Campus, Paisley, UK*

Abstract

Purpose – This article aims to explore student views from a UK higher educational institution about the concept of remote online higher educational delivery. Students were asked about opinions towards working remotely and the psychological impact this had upon students and students' studies. The research provided students with the opportunity to reflect upon whether the practice of delivering education remotely continues to provide students with a beneficial student learning experience.

Design/methodology/approach – The research adopted a case study methodology utilising a mixed methods approach via questionnaire-based research. In total, 894 students completed the questionnaire. The aim of the research was to obtain a wide breadth of student opinion from multidisciplinary backgrounds to ascertain whether students' learning experience differed per subject area.

Findings – The research identified some interesting findings, namely that certain participants considered that learning remotely online was beneficial for instant feedback, supported motivation and fostered communities of practice. Negative perspectives related to feeling isolated, unmotivated and a preference towards face-to-face (F2F) delivery. One of the main areas of conflict identified from this study is that the aspect of engagement can impact students' online learning both positively and negatively.

Originality/value – The study provides an in-depth multidisciplinary student tertiary perspective relating to online remote learning. The findings from this study can be useful for educators to reflect upon and inform educational policy in relation to how best to facilitate and support the student learning experience off-campus.

Keywords COVID-19, Remote teaching, Hybrid delivery, Synchronous learning, Asynchronous learning, Blended learning, Higher education

Paper type Research paper

Introduction

In the UK and globally, within the domain of primary, secondary and higher education there has been an abrupt shift from F2F classroom delivery to remote online teaching. There has also been a rapid change to the way in which how education is being delivered but also how it is being received and digested by students where the "new norm" has become learning and studying from home. Many academic institutions were not initially prepared to make the transition to full online educational delivery (Daniel, 2020). During the pandemic, the primary approach towards remote delivery was fully online with the main aim focussed upon a continuity of educational delivery and limiting the disruption to students' studies (Quezada *et al.*, 2020).

Despite adapting towards delivering education fully online during the pandemic, this has been a challenging time for students across the globe with many having to adjust to learning remotely online in the context of the restrictions that the pandemic enforced upon society. For many students, the pandemic and learning from home without any F2F interaction brought additional stress and anxiety (Kee, 2021). A principal challenge for educators has been to try to maintain a sustained level of engagement amongst students when delivering courses online (Trinidad, 2021). For many students trying to deal with the "new norm" of educational delivery, the aspect of social isolation was challenging (Shin and Hickey, 2021). This coincided with the fact that many academic establishments globally radically had to readdress how they would revamp academic provision for their students in addition to supporting student mental well-being (Sahu, 2020).

Coronavirus disease 2019 (COVID-19) also accentuated several additional issues for students such as highlighting digital inequalities with some not having access to computers, laptops or tablets with poor Wi-Fi infrastructure exacerbating the problem of learning remotely (Oyedotun, 2020). Traditional F2F delivery was no longer the norm and educational buzzwords such as e-learning, distance learning, synchronous and asynchronous learning and flipped classrooms were immersed into the shifting pedagogical landscape. Despite these educational concepts being in existence for a relative period, educators had to accommodate and integrate them into the curriculum where relevant. The flip side of this pedagogical coin was that students had to acclimatise themselves to these modes of academic delivery in a remote learning environment.

The aim of this paper is to revaluate and reflect upon the benefits and drawbacks of online delivery in the context of remote educational online delivery. This is achieved via engagement with the academic literature to identify generic commonalities and preconditions to initiate and successfully deliver remote online learning. This paper further presents empirical findings from a case study on students' views about online remote learning during the pandemic in addition to the impact this has had on their health and well-being.

Educational online delivery
The onset of the global pandemic accentuated the relevancy of online learning and distance learning though it should be acknowledged that these educational delivery practices have been around for quite some time (Lynch, 2020). Difficulties abound in trying to define the concept of e-learning, as it can be viewed from diverging perspectives such as technology driven, delivery-system orientated, communication orientated and educational-paradigm orientated (Sangra et al., 2012). Advances in technology through developments in smart phones, tablets, laptops, virtual and augmented reality capabilities mean distance learning can be delivered through multiple devices. From an educational delivery perspective, the utilisation of technology when applied to distance learning has the potential to make the teaching-learning process more "student-centred, more innovative, and even more flexible" (Dhawan, 2020, p. 7). Distance learning is primarily initiated in educational institutions when students are separated geographically from their campus, teachers and institution's services (Lentel, 2012).

The use of video communication apps such as Microsoft Teams have provided educators with an opportunity to bridge the "distance and time" gap when delivering education remotely (Martin and Tapp, 2019). The plethora of instant messaging and communication apps now available, such as Zoom, Discord, Google Meet and Google Hangouts, can facilitate and support the distance learning process for staff and teachers. COVID-19 and remote learning has accentuated the use of communication apps to support synchronous and asynchronous online distance learning. However, in the context of the "new norm" when delivering education, even more consideration needs to be given to the "pedagogical fit" of online platforms towards supporting distance learning.

Pedagogy of online learning

Synchronous online learning, which is learning that is delivered by the teacher in real-time and during the same time to the students, accommodates the pedagogy of collaborative learning (CL) or communities of practice (COP). COPs are perceived as being "social groups that share common interests and goals in a particular field and interact to build relevant knowledge and expertise" (Mavri *et al.*, 2021, p. 1). Synchronous online learning, if implemented correctly, has the potential to make students feel engaged and to have a sense of connectivity and belonging with their teacher and other students (Francescucci and Rohani, 2019). Synchronous learning, via the use of online communication apps, when applied collaboratively and interactively, can also support the learning theory of social constructivism. Social constructivists contend that learning occurs socially through interaction and collaboration (Finnegan and Ginty, 2019). The use of synchronous chat facilities on video communication app platforms such as Microsoft Teams and Discord can allow students to communicate and share tacit knowledge with their peers and teacher.

Synchronous and asynchronous online learning, when applied collectively, can support the process of reflection, transforming reflection into an "active shared process", thereby empowering the "constructivist method of reflective knowledge acquisition" (Bye *et al.*, 2009, p. 843). Online communication and video apps can sustain the concept of dialogic feedback and feed-forward. Through online discussion, "meaning and understanding" can be shared in a timely fashion between lecturer and student regarding feedback for current and forthcoming coursework (Hill and West, 2020, p. 83). Online remote learning, dependent upon its application, can also accommodate the process of online scaffolding. Through online synchronous communication and feedback, teachers can assist students in relation to learning and problem solving within their zones of proximal development with the intention of developing "self-regulated students" (Brauer *et al.*, 2019, p. 55).

Benefits of remote online learning

The advantages of delivering education online have been well documented in the academic literature. Online delivery of classes can provide students with a degree of flexibility and self-motivation through self-directed learning (Davis *et al.*, 2019). Remote online learning, delivered synchronously or asynchronously, can provide students with educational accessibility geographically, delivering a more "inclusive and equitable learning experience" (Bower *et al.*, 2015, p. 2). The distance aspect, which is associated with learning remotely, can provide students with a plethora of choice in how they access course material. Through the concept of mobile learning, accessibility of course material can be retrieved through smart devices such as phones and tablets. Furthermore, whilst there are acknowledged challenges pedagogically in their application of distance learning, the onset of immersive technologies such as virtual and augmented reality have enhanced the way distance education can be delivered and accessed by students (Ntaba and Jantjies, 2021). When learning remotely online, especially asynchronously, students can become members of a virtual community through engagement and constructively influencing other students and feeling immersed in the experience (Lin and Gao, 2020).

Challenges associated with remote online learning

Student motivation, or lack of it, can sometimes be perceived as being a barrier towards online learning, especially when delivered remotely. Reasons attributed to this can sometimes be factors relating to lack of F2F communication and a lack of student familiarity and accessibility to certain types of technology required to engage in remote online learning (Shin and Hickey, 2021). COVID-19, in the context of remote online learning, intensified the debate

surrounding the notion of digital inequalities in relation to students who might be socially or economically disadvantaged towards obtaining devices to engage with remote learning (Beaunoyer *et al.*, 2020). Student unfamiliarity on how to use certain online resources can also be a stumbling block towards successful online delivery of courses. Furthermore, students who have a preference towards F2F delivery as opposed to learning online may find the transition towards digitisation of learning more difficult or stressful (Oyedotun, 2020). Dependent upon how courses are delivered online, lack of interaction can make students feel disassociated from other another and that they are not part of a community. General apathy with online learning compounded by technical problems and a lack of being unable to understand course work instructions through remote learning can present significant challenges to both teacher and student (Dhawan, 2020).

Research design and case study background

A mixed methods design was adopted for the research as opposed to a monomethod design because embedding the incorporation of qualitative and quantitative research would provide the study with a contrast of data with the evaluation of variables and context-dependent knowledge. The data collection tool used for the purposes of the research study was a self-administered web-based questionnaire using the web-based tool SurveyMonkey. The mixed methods methodology approach was embedded into the research design via the incorporation of closed and open questions. The sampling technique employed for this research was a non-probability sampling approach where natural sampling, sometimes also known as convenience or availability sampling, was used. The questionnaire was disseminated across all schools at the university at its main campus, namely Business and Creative Industries, Computing, Engineering and Physical Sciences, Education and Social Sciences and Health and Life Sciences.

The statistical analysis techniques used to evaluate the data gathered from the questionnaires included descriptive statistics (N, mean and standard deviation) and non-parametric inferential statistics including Mann–Whitney U tests and Wilcoxon-matched pairs signs rank tests. The qualitative data were examined to identify any specific themes that related to the literature in addition to identifying any new themes yet unreported in the literature. Prior to the study commencing, ethical approval was sought and granted from the school's research ethics committee, application 13,663.

The aim of the questionnaire was to ascertain views, perspectives and experiences regarding the changing nature of educational practice and delivery in the context of COVID-19. The questionnaire explored attitudes and perceptions related to the delivery of educational programmes focussing primarily on synchronous remote online delivery. The questionnaire was divided into three sections. The first section contained demographic and general questions. The second part asked participants to reflect upon their experiences and views regarding the impact COVID-19 has had on the delivery of their educational programmes. The third part of the questionnaire asked participants to express their views about the how working and learning from home had an impact on their health and well-being.

Results

In total, 894 participants completed the "Changing nature of educational practice and delivery in the context of COVID-19 Student Perspectives" questionnaire and 299 participants (33.9%) were in Year 1 (L7), 220 (24.7%) were in Year 2 (L8), 218 (24.5%) were in Year 3 (L9) and 154 (17.3%) were in Year 4 (L10).

Of the participants, 211 (23.7%) were from the School of Business and Creative Industries, 153 (17.2%) were from Computing, Engineering and Physical Sciences, 223 (25.1%) were

from Education and Social Sciences and 301 participants (33.9%) were from Health and Life Sciences. Of the participants, 248 (27.7%) were male, 627 (70.1%) were female, 11 (1.2%) were non-binary/third gender, 7 (0.8%) preferred not to say and 1 participant (0.1%) preferred to self-describe. The mean age of participants was 28.5 (standard deviation (SD) = 9.89) with a range of 17–65. A Mann–Whitney U test indicated that there was no significant different between males and females in relation to age ($Z = -1.868$, $p < 0.06$). The majority of participants (366, 40.9%) lived at home with parents, 27 (3%) lived in the student halls of residence, 229 (25.6%) lived in rented accommodation, 246 (27.5) owned their own property and 26 participants (2.9%) selected other such as for example living with a grandparent.

The students were asked whether they were familiar with the concepts of synchronous and asynchronous learning prior to the university shifting to remote online delivery. Of the participants, 251 (28.1) stated that they were not at all familiar, 270 (30.2%) stated that they were not so familiar, 254 (28.4%) stated that they were somewhat familiar, 79 (8.8%) stated they were very familiar and 39 (4.4%) stated that they were extremely familiar. Participants were also asked whether their academic institution appropriately explained the terms synchronous and asynchronous prior to the commencement of classes. The majority of students stated yes (488, 54.7%); however, 369 participants (41.3%) stated "no" potentially indicating the presence of a major communication and understanding issue. In total, 35 participants (3.9%) stated "other" for example that they do not remember or were unsure. Participants were asked to rate if they believed that synchronous online delivery was pedagogically beneficial and whether they believed that asynchronous online delivery was pedagogically beneficial (see Table 1).

A Wilcoxon-matched pairs signed ranks test indicated that synchronous (Mean = 3.84, SD = 1.05) delivery was considered to be significantly more beneficial than asynchronous (Mean = 3.36, SD = 1.19) ($Z = -9.153$, $p < 0.05$).

Mann–Whitney U tests indicated that Year 1 students felt that synchronous delivery was significantly more beneficial than Year 2 ($Z = -2.076$, $p < 0.038$) and Year 3 ($Z = -1.983$, $p < 0.05$) students. There was, however, no statistically significant difference between Year 1 and Year 4 level ($Z = -1.056$, $p < 0.291$). There were no significant difference between Years 2 and 3 in relation to the pedagogical benefits of synchronous delivery ($Z = -0.032$, $p < 0.974$) or Years 2 and 4 ($Z = -0.693$, $p < 0.488$). There were also no significant difference between Year 3 and 4 ($Z = -0.655$, $p < 0.512$).

Mann–Whitney U tests indicated that Year 1 students felt that asynchronous delivery was significantly more beneficial than Year 2 ($Z = -2.300$, $p < 0.021$). There was no significant difference between Years 1- and 3-level ($Z = -1.855$, $p < 0.064$) students. Year 1-level students found asynchronous delivery to be significantly more beneficial than and Year 4 level ($Z = -5.069$, $p < 0.000$).

There were no significant difference between Year 2 and 3 in relation to the pedagogical benefits of asynchronous delivery ($Z = -0.510$, $p < 0.610$). Year 2 students found asynchronous delivery to be significantly more pedagogically beneficial than Year 4

	Delivery approach	
Answer	Synchronous	Asynchronous
Strongly agree	259 (29.1%)	156 (17.5%)
Agree	374 (42%)	310 (34.8%)
Neither agree nor disagree	149 (16.7%)	195 (21.9%)
Disagree	74 (8.3%)	156 (17.5%)
Strongly disagree	34 (3.8%)	75 (8.4%)

Table 1.
Synchronous or
asynchronous delivery
being pedagogically
beneficial

($Z = -2.596, p < 0.009$). Year 3 students found asynchronous delivery to be significantly more beneficial that Year 4 ($Z = -3.200, p < 0.001$). When split by year, a Wilcoxon-matched pairs signs rank tests indicated that all year levels' synchronous delivery as having greater benefits than synchronous delivery (see Table 2).

Participants were asked to rank the following models of educational delivery: synchronous online learning (delivered in real time), asynchronous online learning (not delivered in real time), traditional F2F learning and hybrid learning (F2F and online).

The results indicated that learners preferred traditional F2F, following by a hybrid model, synchronous and asynchronous model. The results are displayed in the following Table 3.

Mann–Whitney U tests indicated that there was no significant difference in delivery model preference in relation to gender in terms of traditional F2F ($Z = -0.613, p < 0.540$), hybrid learning ($Z = -0.291, p < 0.771$), synchronous online learning ($Z = -0.140, p < 0.889$) and asynchronous online learning ($Z = -0.488, p < 0.626$).

Participants were asked to rate the effectiveness of online learning and communication mediums for online course delivery. The results are displayed in Table 4.

The results indicated that Microsoft Teams was the overall preferred online learning and communication medium for online course delivery. This is not a surprising finding as the platform is being used by the institution for remote course delivery. MyUWS, the university's

	Delivery approach		
Year	Synchronous	Asynchronous	Wilcoxon
1	$M = 3.97$ (SD = 0.98)	$M = 3.58$ (SD = 1.10)	$Z = -4.884, p < 0.000$
2	$M = 3.77$ (SD = 1.06)	$M = 3.31$ (SD = 1.27)	$Z = -3.220, p < 0.001$
3	$M = 3.75$ (SD = 1.11)	$M = 3.38$ (SD = 1.17)	$Z = -3.024, p < 0.002$
4	$M = 3.83$ (SD = 1.10)	$M = 2.97$ (SD = 1.21)	$Z = -5.526, p < 0.000$

Table 2.
Preference for synchronous or asynchronous delivery split by academic year

Delivery model	Ranking	Mean	SD
Traditional face to face	1st	1.84	1.13
Hybrid learning	2nd	2.38	0.93
Synchronous online learning	3rd	2.64	0.94
Asynchronous online learning	4th	3.15	1.05

Table 3.
Participant ranking of educational delivery models

Medium	Ranking	Mean	SD
MS teams	1st	3.93	1.04
MyUWS	2nd	3.87	0.99
YouTube	3rd	3.61	1.01
Zoom	4th	3.54	1.05
Aula	5th	3.11	0.97
Discord	6th	2.95	0.91
WebEx	7th	2.86	0.86
Loom	8th	2.82	0.75
Virtual reality	9th	2.80	0.83
Skype	10th	2.74	0.95
Facebook live	11th	2.53	0.94
Instagram	12th	2.50	0.99

Table 4.
Effectiveness of online learning and communication mediums

virtual learning environment (VLE) was ranked second predominantly due to the participants' familiarity with its use. Aula, the learning experience platform, in its initial stages of use by the university to replace myUWS, was ranked fifth potentially due to not all participants having had experience of using it. Of interest is the ranking of virtual reality (VR) in ninth place indicating that some participants are yet not entirely comfortable or familiar with use of immersive technologies for remote learning.

Participants were asked to rate how beneficial they considered the potential benefits of synchronous online learning. The results are displayed in the following Table 5.

What is interesting to note is that despite participants stating that asynchronous online delivery was useful for receiving instant feedback and that being well structured it can prove to be successful to support learning online, it was not acknowledged as being a beneficial pedagogical approach for enhancing the student learning experience.

Participants were asked the same question but in the form of an open-ended response to contextualise participant views and to assess whether any identified themes related to the academic literature. A recurring theme of interest was that synchronous online learning was beneficial for supporting dialogue, for e.g. the ability to ask questions and have real-time conversations with the lecturer. This view is supported in the following statements:

> You are able to ask question as the lesson is taking place. This also allows for conversations between yourself and the lecturer that others are able to intervene if they are struggling to understand or want to question the same thing.

> You are able to ask questions and discuss further on topic, it allows you to have a student teacher relationship and it can help individuals understand or rethink the given information.

An additional prevalent theme identified by participants was that they considered online synchronous learning to be highly beneficial towards fostering and sustaining a supportive online community, akin to a COP:

> Learning together in real time allows you to bounce off your peers and support each other with the materials and to make sure that we are not missing something as can be the case with asynchronous learning. Especially for those returning into education or are not as used to using online platforms.

> There is immediate personal engagement between students and instructors, which may create greater feelings of community.

> It allows you to build a relationship with the people you are learning from and able you to get to know each other without just being a writer on the other end of an email.

Despite the literature stating that an obstacle towards online synchronous learning can sometimes be a lack of student motivation to engage with this style of educational delivery, a vast majority of respondents indicated that synchronous online learning does in fact facilitate student engagement and promotion:

Benefit	Ranking	Mean	SD
Instant feedback	1st	4.31	0.92
Well-structured delivery	2nd	4.19	1.05
Ability to ask questions	3rd	4.19	1.05
Online interaction	4th	3.97	1.08
Supports knowledge construction	5th	3.82	1.02
Independent learning	6th	3.81	1.03
Enhanced learning experience	7th	3.79	1.14

Table 5.
Potential benefits of
online learning

Education is delivered at a specific time–when students are at home–and this encourages students to interact with university learning teams on a regular basis–throughout term time–and learning online.

Motivation to actually be present at that time. Sometimes if it's not in real-time it can be really difficult to motivate yourself to go watch the recorded lectures, do the readings, answer questions etc.

Other themes in relation to the benefits of online synchronous learning identified by the participants were that it (1) supports instant feedback, (2) encourages CL, (3) increases confidence in learning, (4) provides structure towards learning, (5) ease of access and (6) convenient and flexible learning approach.

Participants were also asked for their views about the perceived drawbacks of online synchronous learning. One overriding theme that emerged, which substantiates findings in the literature, was the theme of unreliability of technology. It was felt that if you have a poor or unstable Wi-Fi connection that remote synchronous online learning was ineffective as a teaching and learning approach. The following responses indicate this:

It's not ideal if problems with IT. It relies solely on student having good access, that was not the case when signing up to face-to-face courses.

Broadband speed and Internet connectivity issues can cause major disruptions like preventing people from joining calls, hearing other people, and seeing content being shared.

Poor Internet connection–either mine or lecturers. Certain lecturers struggling with technology causes delays and can become wearing. It feels awkward logging in to a meeting late–things happen–especially when working from home so it can be uncomfortable joining late.

Another overriding theme that emerged was that amongst certain participants there was a preference for F2F delivery over that of asynchronous online delivery. What solidified this viewpoint was that there was a feeling of a lack of connectivity between student, class and lecturer and an absence of socialisation that you obtain through learning in person in a lecture room. The following responses indicate this:

Just is not the same as face to face, if you do not have the motivation/focus to work at home then it is a miserable experience.

Miss the face-to-face interaction with other students, which is important for team-building and camaraderie.

Teaching face to face you take more information in when learning from home I feel unmotivated.

Participants also acknowledged that there were several other limitations towards remote online synchronous delivery that included the following: (1) preference for asynchronous delivery; (2) distractions whilst learning from home; (3) balancing home life commitments and (4) a feeling of being isolated from the rest of the class. One other interesting theme emerged, namely the lack of the student university experience where some students felt that this cannot be replicated via online asynchronous delivery. This is indicated in the following statements:

You are not able to interact with lecturers individually or interact with classmates on a one-to-one basis. You do not get the proper University experience e.g. in person lectures and tutorials, union, gym and all the basic experiences of a student.

It is not the experience a student should be having. It is difficult. There is not much of a class feel.

There is no real-life classmate support or having that "university life".

Doesn't feel like a real lecture.

Participants were asked to rate their preferred pedagogical approach for online course delivery (see Table 6).

Mann–Whitney U tests indicated that females preferred the following pedagogical approaches to a significantly greater degree than males: asynchronous lectures ($Z = -2.590$, $p < 0.010$), individual assignments ($Z = -2.076$, $p < 0.010$), online tutorials ($Z = -2.196$, $p < 0.028$) and online teams meetings ($Z = -2.391$, $p < 0.017$). Males seemed to prefer group-based assignments ($Z = -2.122$, $p < 0.034$) and coding or software demonstrations to a significantly higher degree than females ($Z = -3.185$, $p < 0.001$) (see Table 7).

These results indicate a particular finding in that when undertaking online synchronous learning, participants preferred individual assignments over group assignments. This was elaborated upon in more detail when participants were asked for their views about their experience of group work in the context of working remotely from home. Quite a few themes of interest emerged and one of those was that group work was deemed to be incompatible with being conducted online. This was indicated via the following responses:

> Group work was a waste of precious time and added stress without gaining any new skills from it. I have worked in teams in person before and the skills gained from that were not mimicked doing it online. Under the current circumstances, doing group work just added stress rather than adding value to my learning.

Another interesting theme that was identified from the participants' responses was that it was difficult to feel part of a community when working as a group online which was due to the lack of student engagement and participation with group work online. For example, it appeared to some participants that using the breakout room feature in Zoom or Microsoft Teams became irrelevant due to their peers not engaging or communicating about coursework-related matters. It was also articulated that you could manage group work more

Pedagogical approach	Ranking	Mean	SD
Online teams meetings	1st	4.03	1.03
Individual assignments	2nd	3.99	0.92
Individual online meetings	3rd	3.93	1.07
Synchronous lectures	4th	3.86	1.16
Online tutorials	5th	3.80	1.02
Asynchronous lectures	6th	3.31	1.34
Online lab sessions	7th	3.04	1.04
Coding or software demonstrations	8th	2.98	0.99
Group-based assignments	9th	2.74	1.32

Table 6.
Preferred pedagogical approach for online course delivery

Pedagogical approach	Male			Female		
	Ranking	Mean	SD	Ranking	Mean	SD
Individual assignments	1st	3.89	0.97	2nd	4.04	0.89
Online teams meetings	2nd	3.88	1.12	1st	4.09	0.99
Individual online meetings	3rd	3.85	1.10	3rd	3.97	1.05
Synchronous lectures	4th	3.78	1.19	4th	3.90	1.14
Online tutorials	5th	3.69	1.04	5th	3.84	1.01
Coding or software demonstrations	6th	3.14	1.08	8th	2.91	0.94
Asynchronous lectures	7th	3.13	1.35	6th	3.38	1.33
Online lab sessions	8th	3.11	1.08	7th	3.01	1.02
Group-based assignments	9th	2.91	1.40	9th	2.68	1.29

Table 7.
Pedagogical approaches split by gender

effectively in person as opposed to online with the other issue being that participation in group work online was non-existent from some students.

> It does not feel like traditional group work, it's a little more difficult to meet together at suitable times for everyone via online meetings, some may have technical difficulties etc. it's a lot more time and effort to prepare for meetings than what it was during face-to-face learning previously.

> It is difficult not being face to face for group work. I would rather work alone when not being able to meet in person.

> It's harder to complete good group work when working from home as I prefer to meet up face to face and discuss rather than waiting for an email reply to discuss ideas or find a time that suits everyone to create a call.

Other themes articulated by participants relating to problems associated with conducting group work online were as follows: (1) difficult to coordinate, (2) F2F group work is more effective and (3) the inequality of group work in terms of certain members of the team having to complete all the work.

Participants were asked to rate how much they agreed with the following statements in association with online delivery of classes.

The results in Table 8 represents a few interesting results one of which is slightly contradictory in the sense that 311 (34.83%) participants stated that online synchronous learning facilitates and supports student engagement, whereas 322 (36.51%) asserted that this mode of educational delivery made them less engaged with their studies. It is also significant to note that 364 (40.72%) of participants strongly disagreed that working from home is less effective than F2F campus delivery. Furthermore, 383 (42.79%) participants also strongly disagreed that they preferred their degree programme to remain fully online.

Participants were asked to what extent some of the following conditions denoted in Table 9 had impacted them during the pandemic whilst learning remotely from home. Working from home seemed to cause most participants 363 (41.16%) significant stress, a feeling of being isolated 299 (33.82%) and anxiety 269 (30.57%).

Discussion

The findings presented in this study have substantiated key issues and arguments represented in the academic literature in relation to remote synchronous and asynchronous online educational delivery. One of the fundamental yet slightly contradictory findings is that some participants perceived the aspect of motivation to be a positive feature of remote online synchronous learning. However, the remote aspect of learning and the difficulties associated with learning from home meant that for some participants there are negative connotations associated with this learning approach. What is important to reflect upon as educators is that individuals learn in different ways and via diverging learning styles. Synchronous online learning might be in general a conducive learning style to some students, but it cannot encompass on "one size fits all" way of delivering education remotely. In the context of this study, the participants were more in favour of synchronous delivery as opposed to asynchronous delivery. This provides an interesting finding so far as it can be argued that for synchronous online delivery of courses to be effective there was a perception amongst participants that a sense of structure is required. Trying to provide normality to students when studying remotely is a challenge for educators. A timetabled structured approach towards learning remotely online can provide students with a degree of motivation and routine allowing them to engage with their course materials.

This research study produced some other key findings that whilst not entirely surprising, corroborate a prevalent theme in the academic literature in relation to online synchronous learning, namely the theme of engagement. How to facilitate and enhance student

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Online delivery of classes facilitates and supports student engagement	159 (17.81%)	311 (34.83%)	156 (17.47%)	145 (16.24%)	122 (13.66%)
Online delivery of classes has made my learning more learner-centred	124 (13.95%)	229 (25.76%)	196 (22.05%)	202 (22.72%)	138 (15.52%)
Online delivery of classes makes me feel less engaged with my studies	322 (36.51%)	224 (25.40%)	138 (15.65%)	136 (15.42%)	62 (7.03%)
Individual coursework assignments have made me feel less engaged when working remotely from home	168 (18.81%)	211 (23.63%)	159 (17.81%)	234 (26.20%)	113 (12.65%)
Working and learning remotely from home is more effective than face-to-face campus delivery	67 (7.49%)	86 (9.62%)	167 (18.68%)	210 (23.49%)	364 (40.72%)
I would prefer for the delivery of my degree programme to remain fully online	114 (12.74%)	83 (9.27%)	93 (10.39%)	160 (17.88%)	383 (42.79%)
Working and learning from home during the pandemic has increased my levels of anxiety	342 (38.60%)	257 (29.01%)	119 (13.43%)	103 (11.63%)	65 (7.34%)
Working and learning from home during the pandemic has made me feel depressed	274 (30.93%)	250 (28.22%)	156 (17.61%)	127 (14.33%)	79 (8.92%)
The unreliability of using my equipment and software from home caused me problems during the pandemic	429 (48.47%)	150 (16.95%)	166 (18.76%)	118 (13.33%)	22 (2.49%)
I received financial assistance from my academic institution to help me buy equipment and software to support me learning from home	37 (4.18%)	64 (7.23%)	171 (19.32%)	222 (25.08%)	329 (37.18%)
I had to invest in upgrading equipment and software to support my learning during the pandemic	219 (24.91%)	276 (31.40%)	101 (11.49%)	190 (21.62%)	93 (10.58%)

Table 8.
Participant views
about online delivery of
classes and learning
from home

engagement via remote synchronous online learning is challenging for educators. The concept of student engagement is one which is often perceived to be multifaceted consisting of behavioural, cognitive and affective elements (Alvarez-Huerta *et al.*, 2021). The dilemma for educators is to consider in terms of their subject area what pedagogical approaches provide students with adequate focus and concentration when listening to educational delivery

online. Tackling the issue of student engagement online will prove to be even more difficult to maintain as students participate at home out with the confines of the traditional university lecture room. This means that learning from home will inevitably bring some unwanted home and life distractions for some students.

Though the participants preferred synchronous online delivery as opposed to asynchronous, there was a clear indication that the most preferable mode of educational instruction remains traditional F2F. For some participants, there was an impression that learning online seemed fake or almost phony and did not equate to a proper student orientated university experience.

The study identified further findings that traverse beyond the student learning experience. The experiences identified were of a different kind, namely psychological related since a significant number of participants suffered from increased stress and anxiety whilst working remotely from home. This could be related to the external factor of the pandemic though it raises an important point that delivering education remotely online places an increased responsibility of pastoral care upon educators.

Conclusions and future directions

The results presented in this study indicate that whilst there are several benefits towards remote online educational delivery there are also potential drawbacks associated with its perception amongst students. Though this case study portrays results from one academic institution, the findings have substantiated quite a few themes that are already prevalent in the literature regarding this subject area. As the hybrid delivery model within higher education evolves, educators must embed novel approaches towards enhancing engagement and maintaining the student learning experience online. For synchronous online educational delivery to be successful, then student engagement is the key. How to achieve and sustain online engagement could be accomplished through interactive activities that promote a community spirit that allow students to get to know one another. Examples of interactive activities might include online quizzes, collaborative question and answer sessions, ice breakers and the introduction of discipline-related video content.

To compound matters, students will have a preference towards synchronous and asynchronous online delivery dependent upon their work–life circumstances, learning styles and how much structure and support they require through the learning process. The question remains whether remote online delivery of education can replicate the true essence of the student university experience. Further empirical work is required to investigate innovative pedagogical approaches towards enhancing the student learning experience online. Research into specific online platforms and technologies to support the learning process will help to inform educators with ways to make their teaching more immersive. An area of further investigation can be the role in which immersive technologies such as VR and serious games can play towards making online lessons more engaging for remote learning.

It is evident that in the context of hybrid delivery, getting the educational balance right in terms of synchronous and asynchronous delivery whilst trying to maintain the university

Condition	To a very great extent	To a great extent	Not at all	To some extent	To a small extent
Isolation	299 (33.82%)	236 (26.70%)	127 (14.37%)	177 (20.02%)	45 (5.09%)
Depression	182 (20.63%)	195 (22.11%)	240 (27.21%)	183 (20.75%)	82 (9.30%)
Anxiety	269 (30.57%)	215 (24.43%)	166 (18.86%)	163 (18.52%)	67 (7.61%)
Stress	363 (41.16%)	200 (22.68%)	107 (12.13%)	161 (18.25%)	51 (5.78%)
Insomnia	190 (21.54%)	183 (20.75%)	302 (34.24%)	136 (15.42%)	71 (8.05%)

Table 9.
Conditions impacting on participants working from home

experience for students will be a challenging one for many academic institutions. There are no
real one-size-fits-all approaches towards the universal application of pedagogical
frameworks. The teaching methods adopted by educators will differ and be effective for
some subject areas as opposed to others.

As this style of educational delivery will remain in existence for the foreseeable future,
what would benefit educators and students alike are guidelines based on empirical studies
relating how to engage with it from different sides of the pedagogical fence. Students could be
informed on how to connect and remain motivated in the context of remote online learning.
Educators, on the other hand, can be provided with guidelines on how to make their lessons
more immersive to address the problem area of online student engagement.

Limitations of study

It should be acknowledged that this study is not without limitations due to the nature of the
case study methodology employed. The fact that the results obtained are from one
academic institution cannot and does not make them generalisable. The findings illustrated
in this case study may deviate per academic institution so overall universal conclusions
cannot be drawn in relation to student perceptions about remote educational delivery
online. It is important to conduct further studies not only to advance this area of research,
but to identify key educational components that can help to formulate a uniform approach
to assist academic institutions towards providing education in this specific mode of
delivery.

References

Alvarez-Huerta, P., Muela, A. and Larrea, I. (2021), "Student engagement and creative confidence
beliefs in higher education", *Thinking Skills and Creativity*, Vol. 40, pp. 1-10, doi: 10.1016/j.tsc.
2021.100821.

Beaunoyer, E., Dupere, S. and Guitton, M.J. (2020), "COVID-19 and digital inequalities: reciprocal
impacts and mitigation strategies", *Computers in Human Behavior*, Vol. 111, pp. 1-9, doi: 10.
1016/j.chb.2020.106424.

Bower, M., Dalgarno, B., Kennedy, G.E., Lee, M.J.W. and Kenney, J. (2015), "Design and
implementation factors in blended synchronous learning environments: outcomes from a
cross-case analysis", *Computers and Education*, Vol. 86, pp. 1-17, doi: 10.1016/j.compedu.2015.
03.006.

Brauer, S., Korhonen, A.M. and Siklander, P. (2019), "Online scaffolding in digital open badge-driven
learning", *Educational Research*, Vol. 61 No. 1, pp. 53-69, doi: 10.1080/00131881.2018.1562953.

Bye, L., Smith, S. and Monghan Rallis, H. (2009), "Reflection using an online discussion forum: impact
on student learning and satisfaction", *Social Work Education*, Vol. 28 No. 8, pp. 841-855, doi: 10.
1080/02615470802641322.

Daniel, J. (2020), "Education and the covid-19 pandemic", *Prospects*, Vol. 49, pp. 91-96, doi: 10.1007/
s11125-020-09464-3.

Davis, N.L., Gough, M. and Taylor, L.L. (2019), "Online teaching: advantages, obstacles and tools for
getting it right", *Journal of Teaching in Travel and Tourism*, Vol. 19 No. 3, pp. 256-263, doi: 10.
1080/15313220.2019.1612313.

Dhawan, S. (2020), "Online learning: a Panacea in the time of COVID-19 crisis", *Journal of Educational
Technology*, Vol. 49 No. 1, pp. 5-22, doi: 10.1177/0047239520934018.

Finnegan, M. and Ginty, C. (2019), "Moodle and social constructivism: is moodle being used as
constructed? A case study analysis of Moodle use in teaching and learning in an Irish Higher
Educational Institute", *Journal of Teaching and Learning in Higher Education (AISHE-J)*,
Vol. 11 No. 1, pp. 1-21.

Francescucci, A. and Rohani, L. (2019), "Exclusively synchronous online (VIRI) learning: the impact on student performance and engagement outcomes", *Journal of Marketing Education*, Vol. 41 No. 1, pp. 60-69, doi: 10.1177/0273475318818864.

Hill, J. and West, H. (2020), "Improving the student learning experience through dialogic feed-forward assessment", *Assessment and Evaluation in Higher Education*, Vol. 45 No. 1, pp. 82-97, doi: 10. 1080/02602938.2019.1608908.

Kee, C.E. (2021), "The impact of COVID-19: graduate students' emotional and psychological experiences", *Journal of Human Behavior in the Social Environment*, Vol. 31 Nos 1-4, pp. 1-12, doi: 10.1080/10911359.2020.1855285.

Lentel, H. (2012), "Distance learning in British universities: is it possible?", *Open Learning: The Journal of Open, Distance and E-Learning*, Vol. 27 No. 1, pp. 23-36, doi: 10.1080/02680513.2012. 640782.

Lin, X. and Gao, L. (2020), "Students' sense of community and perspectives of taking synchronous and asynchronous online courses", *Asian Journal of Distance Education*, Vol. 15 No. 1, pp. 169-179.

Lynch, M. (2020), "E-learning during a global pandemic", *Asian Journal of Distance Education*, Vol. 15 No. 1, pp. 189-195.

Martin, L. and Tapp, D. (2019), "Teaching with teams: an introduction to teaching an undergraduate law module using Microsoft Teams", *Innovative Practice in Higher Education*, Vol. 3 No. 3, pp. 58-66.

Mavri, A., Ioannou, A. and Loizides, F. (2021), "Cross-organisational communities of practice: enhancing creativity and epistemic cognition in higher education", *The Internet and Higher Education*, Vol. 49, pp. 1-13, doi: 10.1016/j.iheduc.2021.100792.

Ntaba, A. and Jantjies, M. (2021), "Open distance learning and immersive technologies: a literature analysis", in Ifenthaler, D., Sampson, D.G. and Isaías, P. (Eds), *Balancing the Tension between Digital Technologies and Learning Sciences. Cognition and Exploratory Learning in the Digital Age*, Springer, Cham, doi: 10.1007/978-3-030-65657-7_11.

Oyedotun, T.D. (2020), "Sudden change of pedagogy in education driven by COVID-19: perspectives and evaluation from a developing country", *Research in Globalization*, Vol. 2, pp. 1-5, doi: 10. 1016/j.resglo.2020.100029.

Quezada, R.L., Talbot, C. and Belen Quezada-Parker, K. (2020), "From bricks and mortar to remote teaching: a teacher education program's response to COVID-19", *Journal of Education for Teaching*, Vol. 46 No. 4, pp. 472-483, doi: 10.1080/02607476.2020.1801330.

Sahu, P. (2020), "Closure of universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff", *Cureus*, Vol. 12, p. 4, doi: 10.7759/ cureus.7541.

Sangra, A., Vlachopoulos, D. and Cabrera, N. (2012), "Building an inclusive definition of E-learning: an approach to the conceptual framework", *The International Review of Research in Open and Distance Learning*, Vol. 13 No. 2, pp. 145-159, doi: 10.19173/irrodl.v13i2.1161.

Shin, M. and Hickey, K. (2021), "Needs a little TLC: examining college students' emergency remote teaching and learning experiences during COVID-19", *Journal of Further and Higher Education*, Vol. 45 No. 7, pp. 973-986, doi: 10.1080/0309877X.2020.1847261.

Trinidad, J.E. (2021), "Equity, engagement, and health: school organisational issues and priorities during COVID-19", *Journal of Educational Administration and History*, Vol. 53 No. 1, pp. 67-80, doi: 10.1080/00220620.2020.1858764.

About the authors
Dr Gavin Baxter is a lecturer in the School of Computing, Engineering and Physical Sciences at the University of the West of Scotland. His research interests relate to embedding employability within higher education contexts and investigating the application of blended and hybrid delivery for teaching and learning purposes. Gavin Baxter is the corresponding author and can be contacted at: gavin. baxter@uws.ac.uk

Dr Thomas Hainey is a lecturer in the School of Computing, Engineering and Physical Sciences at the University of the West of Scotland. His research interests are serious games and games-based learning, pedagogical content integration, assessment integration, evaluation of games in various subject areas and industrial settings for the purposes of education and training.