Peerless? How students' experience of synchronous online teaching can disrupt the development of relationships to peers, teachers, subject and self

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Abstract

Learning is socially constructed, influenced by the norms of the learning environment as well as the relationships within it. As higher education students continue to access their learning through online platforms during the pandemic, some find the experience stressful and intimidating. Higher education students develop four key relationships during their studies: to self, to teachers, to peers and to subject. Might the shift to online learning have impacted the development of these key relationships? And if so, could adjustments to the design of online learning help? Thematic analysis of student feedback about online learning provision (n=496) indicates peer relationships are disrupted by limited interactional opportunity during some online learning formats, and that the peer relationship plays a mediating role in the development of other key relationships. Problematic synchronous teaching formats are identified and mitigations suggested. These findings are of interest to all seeking to optimise the design and delivery of online learning.

Keywords: Peer relationships, Online learning, Key relationships in higher education

Introduction

The role of social interaction and relationships in learning

A sociocultural view of learning assumes a socially constructed process that is influenced by the learning environment and its associated norms, as well as by the interactions between the learner(s) and others within it (Littleton & Mercer, 2013; Wertsch, 1991). Thus, learning is not only socially constructed but relational in nature (Quinlan, 2016).

The relationships that students form with their peers are of great importance; indeed, they can be preoccupied at the beginning of their studies with establishing them (Beard et al., 2007). But the role of peer relationships extends beyond friendships; studies have shown that peer interaction is related to engagement with learning and outcomes (Moran & Gonyea, 2003); social embeddedness can positively influence learning and attainment (Thiele et al., 2018); and forming strong relationships with subject peers can encourage, challenge and support students to meet learning goals (Stavely, 2015). These peer relationships can be incorporated into effective teaching methods too; collaborative learning activities can help students develop the social skills required to complete them, while also enhancing peer relationships and increasing students' engagement with the subject (Zepke & Leach, 2010).

When considering the relational nature of learning, we must also think about teaching staff. How students relate to their teachers can influence whether they take a surface or deep approach to learning (Trigwell et al., 1999), their willingness to express their opinion during teaching activities (Mearns et al., 2007) and whether they will ask questions to clarify their understanding (Micari & Calkins, 2021). Student perceptions of the relationship between themselves and their teachers can also affect the emotions they experience; students report feeling motivation, engagement and enjoyment when they perceive high levels of non-verbal immediacy from their teachers (Titsworth et al., 2010) and boredom, hopelessness, shame and anxiety when the inverse is true (Mazer et al., 2014). Thus, the relationship between teacher and student has an emotional dimension which can encourage or discourage engagement with the subject (Pekrun et al., 2011; Quinlan, 2019). The relational nature of higher education students' learning is therefore of interest, because the social, emotional and intellectual climate of a programme of study will impact upon a student's experience of, and engagement with, it (Ambrose et al., 2007).

Learning in the online sphere

The delivery of effective teaching in higher education is an evolving art, shaped by both internal and external pressures (Devlin & Samarawickrema, 2010). When the pandemic prompted a rapid pivot to online learning, a generous and collegiate response from more experienced higher education institutions helped faculty staff rapidly adapt course content while keeping the basic principles of effective teaching, assessment and feedback in mind (Carless, 2020; Wong & Kwong, 2020). It was acknowledged that simply transferring content online was not sufficient; for learning to be optimised in this new learning environment, content needed to be adapted to fit the constraints and advantages of the medium (White, 2020; Yang & Huang, 2021).

Creating an ideal online learning environment within the constraints of an immediate and unplanned shift to different platforms is challenging. Some of the issues impeding efforts

to teach effectively online have related to technical or infrastructural issues beyond the control of faculty staff (Romero-Hall & Jaramillo Cherrez, 2022). But with thoughtful adaptation of content, delivery and communication methods, it is possible to establish teacher presence online asynchronously (Borup et al., 2012), engage students at a social and emotional level as well as cognitive (Pi et al., 2022) and create thriving, supportive learning communities (Nordmann et al., 2020; Ross & Bain, 2016). As well as uncovering aspects of good online teaching practice, emerging research in this field has identified issues with student participation and emotional stress (Hopwood, 2021; Lapitan Jr. et al., 2020; Tinsley, 2020). Could this reluctance to engage with learning in the online environment be relational and emotional in nature, and if so, how might we understand and address it?

Advancing the research agenda

According to Quinlan (2016), 'emotion matters in higher education because education is relational, and emotions are central to relationships' (p. 102). She posited four key relationships which higher education students develop: to peers, to teachers, to subject and to self, and suggested that the emotions which arise in those relationships influence the extent to which they flourish or dwindle.

At the time of writing, reflective and instructive accounts of how the pivot to online has impacted access to learning are available (see Ndzinisa & Dlamini, 2022). But the ways in which our students experience online learning and the ways in which this might impact the development of their four key relationships has received little analytical focus. An investigation of how the relational nature of student learning in higher education may have been impacted by students' experience of the pivot to online is therefore of interest, as it may help faculty staff understand some of the issues with student engagement that they have encountered. And given that the global goal of achieving control of the coronavirus through vaccination is some way off, this is particularly pertinent.

This paper extends the knowledge in this area by using Quinlan's four key relationships in higher education as an analytical framework to explore which dimensions have been impacted by students' experience of online learning opportunities. It identifies problematic online learning formats and suggests adjustments to foster the development of students' key relationships online. The findings of this study are of interest to faculty staff and leadership wishing to inform or improve the design and delivery of online learning.

Method

Survey design, sampling and ethics

A brief survey about online learning (included in the Appendix) was disseminated to all undergraduate and postgraduate students at a Russell Group university between the dates of 28th October to 9th November 2020. Participation was voluntary and over two thousand students chose to complete it. All questions had closed responses on a four point Likert scale apart from the final question, which provided a free text box for students to type an answer to the following: *If you haven't been participating much in online learning opportunities, would you like to tell us why?* Participant responses ranged in length from 7 to 761 characters. Responses were entered by students across undergraduate and postgraduate years of study and from all faculties (Arts, Engineering, Health Sciences, Life Sciences, Sciences, Social Sciences and Law). The analysis that follows focuses exclusively on the free text responses of students who answered that question (n=496).

Coding procedure

Quinlan's (2016) paper on the four key relationships in higher education was used as the basis for a coding frame, which was derived by identifying activities and behaviours in Quinlan's description of each relationship. These activities and behaviours were listed as key relationship dimensions, then rationalised to group similar items as one activity, e.g., "group work" and "shared tasks" became "group work/shared tasks". The codes and dimensions derived from Quinlan's paper can be found in Table 1. A dual approach to handling the data was taken, comprising a two-step thematic analysis within a framework for conducting a robust thematic analysis (Braun & Clarke, 2006; Watts, 2014). Each participant comment was coded for the relationship dimension(s) being referred to and the way(s) in which that dimension was being discussed. Many participant comments contained references to more than one relationship dimension, and each was coded separately so that all the data was captured. Each of these coded extracts was assigned an alphanumerical identifier and logged against the relevant key relationship and dimension. The data extracts within each key relationship were then grouped thematically.

Analysis

The textual data were analysed to explore how online learning might have impacted the development of students' developing relationships to Teachers, Peers, Subject and Self. Table 1 shows the frequency with which relationship dimensions were referenced within the student comments, against the coding frame.

Table 1 Frequency of relationship dimensions, as derived from Quinlan (2016) found in the data

Key relationship dimension	Frequency	
TO SUBJECT		
Perceived relevance	11	
Perceived value	25	
Feeling(s) toward subject	15	
Teacher's attitude to subject	2	
Connection to subject	28	
Making connections	10	
Exploring / discussing perspectives	11	
Developing contextual understanding	6	
Contributing to debate	22	
Authentic inquiry opportunities	5	
Range of media	0	
TO TEACHERS		
Nature of communication	24	
Interest in supporting/understanding student	23	
Clearness and consistency of communication	9	
Communicating expectations	4	
Student provides teacher with feedback	13	
Teacher enthusiasm/warmth	4	(3 negative, one positive)
Teacher shares experience	0	
Teacher emotionally expressive	4	
TO PEERS		
Opportunities to get to know peers / familiarity with peers	93	
Group work / shared tasks	32	
Sense of belonging (subject)	28	
Informal discussion opportunities	7	
Sense of community (learning)	19	
TO SELF		
Opportunities to test oneself	2	
Authentic learning opportunities	5	
Reflective learning	3	
Accepting discomfort/developing resilience	0	
Real life questions	5	
Belonging to learning community	15	
Deconstructing old thinking	0	
Tolerating ambiguity	0	
Experiencing transformative learning	0	
Critical reflection	1	
Service learning (on the job)	0	

Excepting one positive comment, all references to the relationship dimensions found in the data were negative. In the analysis below, a précis of each key relationship is given before the associated relationship dimensions found in the data are summarised.

Relationship to teachers

Quinlan (2016) maintains that the way in which teachers communicate with students influences how the students feel. The nature, consistency and clarity of that communication

therefore affects the developing student-teacher relationship, as do the student's perceptions of the teacher's warmth, enthusiasm and emotional expressiveness.

These students' experience of synchronous learning negatively impacted the quantity and quality of communication between teacher and student, which was described as 'awkward [054]' and 'laborious [151]'. Some had to communicate exclusively through the Chat function, which felt disjointed and discouraging:

> The disconnect between students and teachers (due to communicating only via message during live sessions) makes participation during live sessions feel worthless – the delay between composing a message and the teacher interpreting it just slows the session down and disables any feeling of true discussion[T120].

Some found that they were unable to communicate with their teacher at all, either because the Chat was disabled or because the teacher 'refused[T111]' to review the questions students had posted. This missing feedback loop during online teaching meant some students felt there was 'little opportunity to connect, we're just being spoken at[T067]'. Another characterised the lack of student-teacher interaction as 'just listening to the information[T160]'.

Where verbal interjection was possible, some students felt discouraged by teachers who responded in a 'defensive and angry[T244]' or 'blunt, abrupt and combative[T009]' manner. Perhaps for this reason, one avoided interaction with their teacher altogether: 'I'm too ashamed and afraid to make a mistake[T119]'. Others expressed reservations about the quality of their contribution: 'if I am going to say an idea it needs to be good enough to warrant turning my mic on, so I rarely do[T493]'.

In addition to anxieties about the teacher's response, some students struggled with the very public nature of student-teacher interaction online:

> I'm very much someone who used to spend a lot of time asking questions. The new [online] setting that forces you to ask questions in front of an audience has somewhat deterred me… In live Q and A sessions with lecturers I find myself hesitant again to ask questions in front of 130+ students[T030].

This reluctance to expose their possible ignorance was not exclusive to new students; a continuing student noted that:

> The main benefit of workshops before Covid was that they were a 'safe space' to work through questions and solutions. Now you have to explain what you're stuck with to

a group, as opposed to one individual, which can seem intimidating / embarrassing[T151].

Both of these quotes indicate an underlying preoccupation with what the rest of the group might think of their interactions, in addition to their anxiety about how their teacher judges their intelligence.

Some students perceived the online learning environment as 'shambolic… chaotic[T070]' and 'disorganised[T111]'. This communicated minimal effort or valuing of their time and provoked an angry response:

> It seems that our education is not being taken as seriously as expected… If lecturers and the department aren't putting that much effort into our education it makes me even less compelled to participate in this broken system[T260].

One student compared the lack of interactivity for some online learning sessions with one teacher's attitude and demeanour, which transformed their learning experience:

> Some of my online live classes feel very awkward. Certain seminars often just feel like lectures because students aren't encouraged to interact. This isn't the case for all of them- I have one seminar which I love even though it's online; the seminar leader is so lovely, bubbly, interactive, asks how we are from the very beginning, uses our individual names and it feels like we're in an actual in person classroom- I always learn so much more in these ones[T075].

Overall, these students' experience of synchronous online teaching has given them few opportunities to interact meaningfully with their teachers, even though the opportunity to do so is valued and conducive to learning. There is little or no opportunity for dialogue, which is sometimes actively discouraged by the lesson design or teacher's demeanour. Their confidence to engage with the taught content seems inhibited by anxiety about the quality of their thinking and how their teachers might react. They also seem preoccupied by how their peers might perceive them.

Relationship to subject

In Quinlan's (2016) view, a student's developing relationship to subject is shaped by their perceptions of its relevance and value, as well as the opportunities they receive to explore its content, make connections, contribute to debate and engage in authentic, meaningful tasks. These in turn shape the student's feelings toward the subject and their sense of belonging or connection to the subject community.

As might be expected from their lack of previous experience, new students expressed more concern about being 'under-prepared[Su044]' for the subject content, feeling 'overwhelmed[Su362]' and 'out my depth[Su086]'. However, new and continuing students alike described a disconnect to their subject through their experience of synchronous teaching as 'disheartening and dry[Su398]', 'demotivating and depressing[Su424]'and 'a very cold, clinical, demoralising way to learn[Su342]'.

A perceived lack of responsiveness on the part of the teacher, whether that manifested as waiting several days for email responses or the difficulty of sharing work online, created barriers to obtaining clarification: 'it can be hard to explain what you're asking without writing it down or showing exactly where you're stuck with a question[Su253]'.

For others, the lack of immediacy was technical:

> I don't see the point in live lectures when both my and my lecturer's wifi frequently cuts out. It's more effective to watch the recording alongside the Powerpoint and take detailed notes[Su109].

While this student found a way to mitigate the technical issues by accessing content asynchronously, doing so after the event meant that they missed any opportunities for enriching their understanding through discussion or interaction with their teacher or peers.

A lack of clarity around how, and what, to study clouded students' perceptions of their subject's perceived relevance and value: 'it's very unclear what we're supposed to know and what to make notes on. It's also unclear what we're meant to be doing in our own time[Su154]'. Again, the one-way flow of teacher-student communication inhibited some respondents' developing understanding: 'the online sessions have often been unclear since we can't ask any questions, so we have all felt fairly confused[Su392]'. For some, there was a sense of the subject moving away from them: 'there's too much content in each unit, we're moving way too fast, my stress levels are making this impossible and I'm getting really behind[Su242]'.

As described previously, opportunities to explore different perspectives and make connections within their subject were hindered by the limited opportunities to interact with teachers, but also by respondents' unwillingness to volunteer opinions in front of peers who remained unfamiliar to them: 'I feel very self-conscious about speaking about a topic I'm not 100% confident on in front of a group of people I've never met[Su073]'.

This analysis does not indicate that these students were developing a growing understanding or appreciation for their subject area, or a sense of belonging to their subject's discourse and knowledge community. Instead, there is evidence of respondents' struggles to engage with their subject through synchronous learning leaving them feeling inadequate to the task of studying it.

Relationship to self

Quinlan (2016) suggests that students develop a relationship to self through engaging in authentic and reflective learning, deconstructing old thinking and developing an intellectual resilience and tolerance of ambiguity. As part of a burgeoning learning community, they can tackle real life questions and test their limits through learning experiences that have the potential to be transformative.

Opportunities to test or extend oneself are not evident in these students' experience of synchronous teaching; instead, they report 'repetitive' sessions which are 'fairly useless … time is wasted on basic content already covered in the reading[Se306]'.

While evidence was found of students experiencing some intellectual discomfort, this did not appear to stem from a carefully scaffolded process of transformational learning, whereby existing knowledge and assumptions were challenged. Instead, there was some overlap with the disconnect students felt in their relationship to Subject; instead of identifying as part of their subject community, respondents' experience of online learning left them feeling 'isolated and distant[Se494]'. As one pointed out, 'it's hard to feel part of a class when we're just bobbing heads on a screen[Se470]'.

Some continuing students indicated a developing resilience and autonomy as they adapted their study habits to what they considered the shortcomings of synchronous teaching:

> I have found live online sessions harder to engage with as I like to pause lecturers and cannot do this… whereas the recorded lectures are much easier as I can pause and get a better understanding while researching the concepts mentioned, before progressing to the next section[Se180].

The few comments relating to opportunities for authentic learning demonstrated the challenge of providing this without facilities or access to live settings. One student felt that the online substitute for a design unit was 'extremely dissatisfactory and difficult to complete[Se130]' with another adding that they 'cannot not learn well[Se360]' from online lab and practical sessions. More generally, there was a sense of purposelessness and isolation: 'going from bed to a desk doesn't have the same vibe as going to a classroom and meeting people to do something [Se398]'.

The shift to online learning has provided an opportunity for students to exploit, in terms of self-directed learning and deeper engagement with their subject. However, these students seem to lack the scaffolding relationships with teachers and peers to experience this opportunity as transformational; instead it has been experienced as isolating, excluding and dull.

Relationship to peers

The development of the peer relationship centres on building familiarity between students following the same programme of study. This can be achieved through small group work, meaningful shared tasks, opportunities to approach and get to know subject peers and informal discussion opportunities. A sense of belonging to both subject and peer learning community also forms part of the developing peer relationship (Quinlan, 2016).

Students frequently referred to the absence of peer relationships in their reasons for avoiding online learning opportunities, with the lack of peer familiarity cited most often. In essence, these students felt that their online learning provision gave them little chance to get to know each other in the context of studying their subject: 'the session ends abruptly and there's no equivalent of having a chat with each other on the way out of the lecture room[P066]'. Given that all students were learning remotely when this study was conducted, this meant that 'you miss out on that friendly familiarity that would make you feel more comfortable[P493]'.

Interacting online therefore, with peers who remained 'strangers[P156]' was 'awkward, uncomfortable[P203]' and 'very stressful[P106]'. This sense of being among a group of people 'who I do not know, who I haven't met in person yet[P107]' meant some students felt 'really anxious about seeming stupid[P417]'. Some avoided interacting during online learning altogether: 'I'm so nervous. I don't want to be judged[P274]'.

The inability to read social cues and body language in online learning fora led to 'embarrassing encounters with people talking over each other and interrupting[P036]' or an 'awkward silence when no one speaks[P066]'. Randomly assigned discussion groups in breakout rooms, with no opportunity to get to know the same group of peers, compounded students' anxieties and sometimes resulted in situations where, 'no one talks. When we go into a breakout room it is silent ... The other day we got put in a breakout room, I started talking and no one replied[P483]'.

Many noted an unwillingness amongst their peers to switch cameras and microphones on, meaning that they could not see the faces of their classmates. When reasons were given, they related to avoiding being singled by the teacher ('it's uncomfortable to be the only one as you're targeted for questions[P037]') or judged by their peers ('it's intimidating and no one else seems to be, so it would be odd to step out of the crowd[P193]').

This sense of being among strangers also affected those who regularly engaged with learning activities offline:

> I have always felt confident making contributions in person but I am struggling immensely with anxiety online. I find it hard to talk for an extended period to a large group of people who I have never physically met. My anxiety is exacerbated by the

fact that no one has their cameras on. I find myself stuttering and going round in circles which is something I never experienced during in-person sessions[P052].

Overall, these respondents experienced the online learning environment, as shared with their unknown peers, as intimidating and hostile. As one respondent summed up:

Online teaching doesn't compare to in-person teaching. You can't see anyone and you don't recognise anyone and it doesn't feel like a comfortable environment because you feel as though you don't know anyone[P235].

These comments indicate that students' lack of opportunity to get to know one another within the context of studying their subject has made it harder for them to interact within the context of learning, entrenching the sense of unfamiliarity and increasing fears of being judged. It has also impacted negatively on their willingness to interact with their teachers and ability to engage deeply with subject content.

Discussion

A disrupted peer relationship online mediates the development of other key relationships

These findings extend Quinlan's (2016) work by showing that dimensions of the four key relationships were disrupted through these students' experience of online teaching and learning. Furthermore, it indicates that the disruption to the peer relationship seemed to mediate the development of the other key relationships.

The students in this study found it hard to develop peer relationships through the limited opportunities available in their online learning environment. Missing out on the serendipitous, spontaneous chances to get to know each other while moving around campus (Jung et al., 2021), the mounting unease that these students felt inhibited the extent to which they interacted with one another during online learning opportunities which were sometimes designed in a way that exacerbated this anxiety.

A pervading sense of peer unfamiliarity affected the depth to which they engaged with their subject during whole group teaching, as fear of attracting the opprobrium of unknown peers led many to refrain from asking questions, debating publicly or revealing gaps in their understanding. Such inhibited interactions with their teachers did not provide them with sufficient opportunity to develop a learning dialogue or to build trust and familiarity, although this analysis has shown that some teachers' deployment of suppressing behaviours towards those seeking help also played a role (Micari & Calkins, 2021).

The reluctance of the students in this study to engage would provide teachers with a limited understanding of their students' opinions and areas for development, making it harder to scaffold their learning appropriately. This is particularly important when new online assessment formats introduced during the pandemic may require additional guidance to complete successfully (Stoakes, 2020), and when issues of digital and temporal equity can affect students' ability to access and complete required tasks (Ndzinisa & Dlamini, 2022). This analysis therefore indicates that weak peer relationships impair student interaction, which in turn inhibits engagement with teachers and subject. It is hard to see how a student's developing relationship to self would remain unaffected, as the learning, communication and support networks between themselves, their peers and their teachers have not developed to support the intellectual challenge and discomfort of transformative learning.

This study therefore provides an update to the view that peer relationships in higher education are important to learning (Beard et al., 2007; Pascarella & Terenzini, 2005) by not only reconfirming their importance in the online sphere (Salmon, 2011), but also underscoring their heightened importance to isolated students who could only interact with each other socially during online learning activities. This study also indicates that disruption to the developing peer relationship negatively impacts these students' developing relationships to teachers, subject and self by inhibiting the dialogues necessary to develop these.

Learning online can be anti-socially constructed

The students in this study frequently attended large online lectures where they felt distant from their subject matter, unknown to their peers and unwelcomed by their teachers; it should also be noted that these students' motivation to learn online was necessity rather than choice (McPartlan et al., 2021). Perhaps with the intent of providing a group size more conducive to debate, students were regularly put in smaller breakout groups. But working with randomly assigned students each time made it impossible to build the peer familiarity required to feel comfortable discussing new ideas, instead encouraging a bystander tendency (Yang et al., 2022) and creating an inhibited, intimidating learning environment. Discussion is an integral part of learning (see Mezirow & Taylor, 2009; Zepke & Leach, 2010), yet this analysis indicates that such online learning formats limit the learning benefit to that discussion by creating an intimidating and repressive atmosphere.

This study also extends the finding that some students leave their mics and cameras off during online learning (Jung et al., 2021; Lapitan Jr. et al., 2020) by providing evidence of a different motivation; namely, to avoid being singled out by teachers or judged negatively by their peers for engaging. In demonstrating these students' desire to avoid drawing attention to themselves, these findings hint at a darker side to peer accountability. Instead

of being encouraged by the behaviour of their fellow students to contribute and engage the social norms within this online learning environment encourage students to refrain and disconnect, ironically contributing to the 'disembodiment and loss of community' (Eringfeld, 2021, p.155) that some higher education students and teachers fear could result from the pivot to online.

Inexpert experts

The pivot to online has not impacted students alone; higher education teachers have had to manage the work and homelife stresses incurred by a sudden switch to remote teaching while attempting to master unfamiliar technologies and platforms (Watermeyer et al., 2020). But they have also had to swiftly adapt their pedagogical practice to the limitations and affordances of the online environment. Video teaching formats limit our ability to read each other's non-verbal cues, facial expressions or use eye contact (Leh, 2001), yet these ways of communicating comprise a teacher's non-verbal immediacy and communication competence (Mazer et al., 2014; Titsworth et al., 2010). These students reported negative emotional responses to online learning opportunities suggest that some teachers, perhaps unaware of the limitations of non-verbal communication through online video teaching, are unknowingly displaying poor levels of communication competence (Hopwood, 2021).

These findings could also indicate a lack of understanding with regard to the need to engage students emotionally and socially as well as cognitively online, or to map what Tualaulelei et al. (2021) call pedagogical touchpoints across online curricula, in order to optimise student engagement across the period of study. As such, and as some survey respondents pointed out, it is not the medium which is problematic here, but the method. These findings can thus be seen as supporting the call for focused training in the effective use of online teaching and learning formats (Romero-Hall & Jaramillo Cherrez, 2022), rather than evidence of their failure. They can also be read as an endorsement of Devlin and Samarawickrema's (2010) assertion that effective teaching in higher education has evolved over time, and evidence that effective teaching within online delivery formats should be incorporated into relevant practice evaluation frameworks.

Facilitating key relationship development through online teaching design

As Adedoyin and Soykan (2020) suggest, online and hybrid teaching is likely to remain a feature of higher education delivery as we adapt to living within a pandemic. This discussion therefore concludes with the following empirically derived suggestions for facilitating the development of students' peer and teacher relationships through the design of online learning opportunities.

An immediate adaptation to enable peer relationship development in online learning would be assigning students to small, regularly convened breakout groups of five to ten

students, with fixed membership for the duration of the unit of study. The smaller numbers and fixed group membership would help them get to know each other quicker and build the familiarity they seek to participate more fully; there is also evidence that smaller groups discourage lurking or bystander tendencies among participants (Yang et al., 2022). Requesting that students switch their cameras on during breakout group work and dropping in to ensure the task is fully understood could also facilitate peer interaction (Lapitan Jr. et al., 2020). Another strategy for increasing opportunities for students to get to know one another would be to include regular and meaningful pair work or small group tasks (3-4 students), which could be incorporated in the lesson plan or completed outside the online session (Quinlan, 2016).

   Teachers can improve teacher-student communication by clearly stating how students can ask questions at the beginning of each session. This may depend on the number of students being taught and the teaching format, e.g., mass lecture or group tutorial, but setting expectations clearly and consistently will reduce anxiety by providing an agreed mechanism for communicating. More importantly, being seen to respond to students' queries, whether through periodically answering questions posted in the Chat or taking questions during a scheduled break will explicitly demonstrate the teacher's interest and responsiveness. If possible, staying on the video call for ten minutes afterwards can provide an online equivalent of students approaching the teacher with questions after a lecture; additionally, setting up optional question and answer sessions for students to attend and help each other have been shown to be beneficial (Jansson et al., 2021).

Limitations to this study

This paper is based on perceptual data collected during a pandemic; therefore the emotional strain of living through such worrying times may be reflected in some of the views expressed. It is possible that issues caused by an initial lack of teacher expertise might have since been addressed, and initial student expectations for online learning might since have been recalibrated. But even if these findings are an artefact of unusual times, they should not be disregarded. The impact of Covid19 is global and ongoing, making blended and online content delivery a likely feature of higher education for some time to come (Hill et al., 2021). The features of online learning design that foster the development of students' key relationships will remain important, and further scholarship to identify enabling pedagogical approaches would be of great value.

Conclusion

This study used Quinlan's four key relationships in higher education as an analytical frame for exploring why some students find online learning environments stressful and discouraging. The issues uncovered in this analysis do not prove that online learning is

inherently damaging to students' developing key relationships, however. Instead, they highlight aspects of the online learning environment which can inhibit the social interaction necessary for enabling the development of peer relationships between students, and the mediating role that peer relationships could play in the development of the other key relationships. These findings can be used to evaluate the design of blended and online curricula. The suggestions for enabling peer and teacher relationship development can be deployed to improve or optimise existing online teaching.

Appendix: Online questionnaire

1a. Level of study

1b. Year of study

2. School / department

3. I am learning a lot about my subject through online teaching (Not at all / not much / to some extent / very much)

4. I feel motivated to complete asynchronous online activities (Not at all / not much / to some extent / very much)

5. I am motivated to study through synchronous live teaching sessions (Not at all / not much / to some extent / very much)

6. I have participated / interacted during synchronous online teaching sessions (Not at all / not much / to some extent / very much)

7. I have been encouraged to participate during synchronous online teaching sessions (Not at all / not much / to some extent / very much)

7a. If you haven't participated much in online sessions would you like to tell us why?

Author's contributions
Isabel Hopwood is the sole author of this research article.

Author's information
Dr. Isabel Hopwood is an academic developer and senior researcher at the Bristol Institute for Learning and Teaching.

Availability of data and materials
Not applicable.

Declarations

Competing interests
The author declares that she has no competing interests.

References

Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*. https://doi.org/10.1080/10494820.2020.1813180

Ambrose, S., Bridges, W., DiPietro, M., Lovett, M., & Norman, M. (2007). *How learning works: 7 research-based principles for smart teaching*. Jossey Bass.

Beard, C., Clegg, S., & Smith, K. (2007). Acknowledging the affective in higher education. *British Educational Research Journal*, *33*(2), 235–252. https://doi.org/10.1080/01411920701208415

Borup, J., West, R., & Graham, C. (2012). Improving online social presence through asynchronous video. *The Internet and Higher Education, 15*(3), 195–203. https://doi.org/10.1016/j.iheduc.2011.11.001

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Carless, D. (2020). Feedback in online learning environments. In *Moving assessment online: Key principles for inclusion, pedagogy and practice*, Advance HE webinar, broadcast on April 9, 2020.

Devlin, M., & Samarawickrema, G. (2010). The criteria of effective teaching in a changing higher education context. *Higher Education Research & Development, 29*(2), 111–124. https://doi.org/10.1080/07294360903244398

Eringfeld, S. (2021). Higher education and its post-coronial future: Utopian hopes and dystopian fears at Cambridge University during Covid-19. *Studies in Higher Education*, *46*(1), 146–157. https://doi.org/10.1080/03075079.2020.1859681

Hill, G., Mason, J., & Dunn, A. (2021) Contract cheating: An increasing challenge for global academic community arising from COVID-19. *Research and Practice in Technology Enhanced Learning*, *16*, 26. https://doi.org/10.1186/s41039-021-00173-9

Hopwood, I. (2021). How online learning can disrupt the development of students' key relationships in higher education. In *International Conference on Open and Innovative Learning: 2021*, Open University of Hong Kong, Hong Kong, 5-7 July 2021.

Jansson, M., Hrastinski, S., Stenbom, S., & Enoksson, F. (2021). Online question and answer sessions: How students support their own and other students' processes of inquiry in a text-based learning environment. *The Internet and Higher Education*, *51*, 100817. https://doi.org/10.1016/j.iheduc.2021.100817

Jung, J., Horta, H., & Postiglione, G. (2021). Living in uncertainty: The COVID-19 pandemic and higher education in Hong Kong. *Studies in Higher Education*, *46*(1), 107–120. https://doi.org/10.1080/03075079.2020.1859685

Lapitan Jr., L., Tiangco, C., Sumalinog, D., Sabarillo, N., & Diaz, J. (2020). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Education for Chemical Engineers, 2021*(35), 116–131.

Leh, A. (2001). Computer-mediated communication and social presence in a distance learning environment. *International Journal of Educational Telecommunications, 7*(2), 109–128. Retrieved May 9, 2020, from https://www.researchgate.net/publication/245749974_Computer-Mediated_Communication_and_Social_Presence_in_a_Distance_Learning_Environment

Littleton, K., & Mercer, N. (2013). *Interthinking: Putting talk to work*. Routledge.

Mazer, J., McKenna-Buchanan, T., Quinlan, M., & Titsworth, S. (2014). The dark side of emotion in the classroom: Emotional processes as mediators of teacher communication behaviors and student negative emotions. *Communication Education*, *63*, 149–168.

McPartlan, P., Rutherford, T., Rodriguez, F., Shaffer, J., & Holton, A. (2021). Modality motivation: Selection effects and motivational differences in students who choose to take courses online. *The Internet and Higher Education*, *49*, 100793. https://doi.org/10.1016/j.iheduc.2021.100793

Mearns, K., Meyer, J., & Bharadwaj, A. (2007). Student engagement in human biology practical sessions. *Proceedings of the 16th Annual Teaching Learning Forum, 30-31 January 2007*. Perth: The University of Western Australia.

Mezirow, J., & Taylor, E. (2009). *Transformative learning in practice: Insights from community, workplace and higher education*. Jossey Bass.

Micari, M., & Calkins, S. (2021). Is it OK to ask? The impact of instructor openness to questions on student help-seeking and academic outcomes. *Active Learning in Higher Education, 22*(2), 143–157. https://doi.org/10.1177/1469787419846620

Moran, E., & Gonyea, T. (2003) *The influence of academically focused peer interaction on college students' development*. Retrieved April 4, 2020, from http://www.eric.ed.gov/PDFS/ED478773.pdf

Ndzinisa, N., & Dlamini, R. (2022). Responsiveness vs. accessibility: Pandemic-driven shift to remote teaching and online learning. *Higher Education Research & Development*. https://doi.org/10.1080/07294360.2021.2019199

Nordmann, E., Horlin, C., Hutchison, J., Murray, J., Robson, L., Seery, M., & MacKay, J. (2020). *10 simple rules for supporting a temporary pivot to online education*. Retrieved May 9, 2020, from https://psyarxiv.com/qdh25

Pascarella, E., & Terenzini, P. (2005). *How college affects students: A third decade of research.* Volume 2. Jossey-Bass.

Pekrun, R., Goetz, T., Frenzel, A., Barchfield, P., & Perry, R. (2011). Measuring emotions in students' learning and performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology*, *36*, 36–48.

Pi, Z., Chen, M., Zhu, F., Yang, J., & Hu, W. (2022). Modulation of instructor's eye gaze by facial expression in video lectures. *Innovations in Education and Teaching International*, *59*(1), 15–23. https://doi.org/10.1080/14703297.2020.1788410

Quinlan, K. (2016). How emotion matters in four key relationships in teaching and learning in higher education. *College Teaching*, *64*(3), 101–111. https://doi.org/10.1080/87567555.2015.1088818

Quinlan, K. (2019). What triggers students' interest during higher education lectures? Personal and situational variables associated with situational interest. *Studies in Higher Education*, *44*(10), 1781–1792. https://doi.org/10.1080/03075079.2019.1665325

Romero-Hall, E., & Jaramillo Cherrez, N. (2022). Teaching in times of disruption: Faculty digital literacy in higher education during the COVID-19 pandemic. *Innovations in Education and Teaching International*. https://doi.org/10.1080/14703297.2022.2030782

Ross, R., & Bayne, S. (2016). *Online Teaching and Learning Manifesto*. Research in Digital Education: University of Edinburgh. Retrieved May 10, 2020, from http://onlineteachingmanifesto.wordpress.com/

Salmon, J. (2011). *E-Moderating: The key to online teaching and learning* (3rd edition). Routledge.

Stavely, Z. (2015). *Can peer accountability groups help students achieve their goals?* Stanford Center for Opportunity Policy in Education (SCOPE). Retrieved May 13, 2020, from https://edpolicy.stanford.edu/news/articles/1368

Stoakes, G. (2020). Issues in managing quality and standards in online assessment. In *Moving assessment online: Key principles for inclusion, pedagogy and practice*. Advance HE webinar, broadcast on April 9, 2020.

Thiele, L., Sauer, N. C., & Kauffeld, S. (2018). Why extraversion is not enough: The mediating role of initial peer network centrality linking personality to long-term academic performance. *High Education, 76*, 789–805. https://doi.org/10.1007/s10734-018-0242-5

Tinsley, B. (2020). *Coronavirus and the impact on students in higher education in England: September to December 2020.* Office for National Statistics: London.

Titsworth, S., Quinlan, M., & Mazer, J. (2010) Emotion in teaching and learning: Development and validation of the classroom emotions scale. *Communication Education*, *59*, 431–452.

Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education*, *37*, 57–70. https://doi.org/10.1023/A:1003548313194

Tualaulelei, E., Burke, K., Fanshawe, M., & Cameron, C. (2021). Mapping pedagogical touchpoints: Exploring online student engagement and course design. *Active Learning in Higher Education*. https://doi.org/10.1177/1469787421990847

Watermeyer, R., Crick, T., & Knight, C. (2021). COVID-19 and digital disruption in UK universities: Afflictions and affordances of emergency online migration. *Higher Education, 81*, 623–641. https://doi.org/10.1007/s10734-020-00561-y

Watts, S. (2014). User skills for qualitative analysis: Perspective, interpretation and the delivery of impact. *Qualitative Research in Psychology*, *11*, 1–14. https://doi.org/10.1080/14780887.2013.776156

Wertsch, J. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Harvard University Press.

White, D. (2020). The need for social presence, not contact hours. *David White Digital Learning Culture*. Retrieved May 10, 2020, from http://daveowhite.com/presence/

Wong, E., & Kwong, T. (2020). HKBU's eLearning and eAssessment. In *Emergency remote teaching – What have we learned?*, Advance HE webinar, broadcast on April 21, 2020.

Yang, B., & Huang, C. (2021). Turn crisis into opportunity in response to COVID-19: Experience from a Chinese University and future prospects. *Studies in Higher Education*, *46*(1), 121–132. https://doi.org/10.1080/03075079.2020.1859687

Yang, T., Luo, H., & Sun, D. (2022). Investigating the combined effects of group size and group composition in online discussion. *Active Learning in Higher Education, 23*(2), 115–128. https://doi.org/10.1177/1469787420938524

Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education, 11*(3), 167–177.

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