

Moving on from emergency-remote-teaching: university teachers' perceived challenges of networked learning[☆]

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ABSTRACT

This paper presents part of the findings of a phenomenographically-informed investigation into higher education (HE) teachers' perceptions of personal learning networks in the context of the recent COVID-19 emergency-remote-teaching (ERT) period, with a specific targeting of perceived challenges. This ERT period has magnified teachers' use of personal learning networks with an absence of a coherent institutionalized approach to ERT, which has presented itself as a unique opportunity through which to explore how Networked Learning (NL) can be incorporated to help teachers manage the longer term shift towards the technologization of HE. The research therefore aims to explore the perceptions of 18 Academic English teachers at a leading English-instruction university in Kazakhstan that was forced to move online at the beginning of COVID-19. The chapter reports the teachers' perceived challenges of using their networks for online teaching and learning—particularly for connecting to people and resources online. The results suggest that teachers perceive the challenges of network use in at least five different ways: i) technological tools, ii) technological skills (training), iii) fractious group communication, iv) subdued communicative spontaneity and v) a sense of isolation. The paper concludes by discussing the implications of the results for teachers and how the challenges can be overcome.

1.0. Research background

As highlighted in the full doctoral thesis (anonymized) and recent book chapter (anonymized) that this investigation branches out from, HE has long been experiencing a general trend towards digitalization as technology has continued penetrating university campuses across the globe [1,2]. This trend has often manifested itself in university teachers' pedagogical contexts, as the promotion of technology-enhanced learning (TEL) [3]. For example, teachers are encouraged to enrich their face-to-face classroom experience by incorporating tools like interactive whiteboards or game-based platforms such as "Kahoot" [4]. This digitalizing effort in HE has also produced an increasing variety of course delivery modes, such as blended learning (BL) [5], whereby teachers are asked to engage with students across a combination of both online and offline spaces on a single programme. Despite this trend towards a more technologically enhanced environment, not all teachers have embraced the paradigm shift; some have resisted [1,2,6]. This resistance to technology integration is often born out of low levels of digital competence, as teachers feel under-equipped to follow this trend [6]; but sometimes it is a more attitudinal challenge for teachers who

fundamentally disagree with imposing technology on their pedagogical practice [7,8].

University administrators have responded to teacher resistance by increasingly adapting their institutions' professional development (PD) programmes to include a greater focus on technology [9,10]. This includes practical workshops or presentations that center on the use of digital platforms for instance, such as Moodle. In parallel with such formal training activities, the practice of NL, whereby teachers develop professionally through informal interactions with colleagues and online resources [11], has also taken place to one [12]. Nevertheless, the impacts of teachers' NL on the changes in their pedagogical beliefs and practices related to technology have remained relatively under-researched due to its informal (and often private and personal) nature that contrast with the "the 'sit-and-get' style of traditional PD ([7], p.57; [13]). Thus, it can be argued that despite the great potential for teacher changes, particularly in technological settings, NL has been under-represented and under-prioritized as a PD mechanism across universities in comparison with more overt traditional PD methods [13].

The challenges mentioned above continued until the spread of the COVID-19 virus worldwide, creating a global pandemic that interrupted

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all forms of face-to-face human activities, including teaching and learning [14,15]. The early part of 2020 delivered an unexpected blow to HE's regular operation [16,17]. This led to many universities being forced to abruptly suspend their operations in the physical classroom and swiftly adapt to the online medium to meet the newly introduced social-distancing regulations. Many faculty-related challenges arose, ranging from their inadequate pedagogical preparation for operating online at such short notice [8,18] to the mental health strain caused by the physical isolation and stress that many of these teachers suddenly found themselves living under [19,20]. Despite these hurdles, the wide consensus is that most universities successfully continued operating in this relatively under-explored online environment throughout this ERT period. In other words, teachers may not have all been perfect "swimmers", but few seem to have "sunk."

Questions remain about how the same faculty who long resisted technological integration had suddenly managed to "stay afloat" during this ERT event. Many would argue that their learning networks, both in connection to other people and online resources, played a significant role during this disruptive event [12], since institutional support was deemed minimal given that universities were caught off guard [21,22]. The notion that teachers were able to continue operating in this online environment that they were unexpectedly thrust into, with little guidance from their institution, suggests that these teachers relied on NL in the absence of more traditional forms of university support and PD [23]. It is argued that lessons can be learnt from this tumultuous period, in relation to how NL can be developed as a dominant PD platform to help teachers with the continuing transition to digitalization. This calls for greater exploration into the challenges associated with the use of personal learning networks during the ERT period to better understand how this NL-inspired PD platform can be exploited in the longer-term future [12]. By informing university administrators, as well as teachers, of how to promote and support NL practices among their faculty by avoiding commonly perceived challenges, this investigation ultimately seeks to facilitate teachers' effective transitions into an increasingly technologically enhanced HE environment [24].

2.0. Research problems and question

Three interrelated research problems have directly emerged from the above teacher NL scenario during the ERT period. Firstly, the practical, and individual level, problems include the notion that university teachers may not fully realize the crucial roles that online forms of collegial collaboration and resource utilization have played in their day-to-day pedagogical practice. This means that they are less likely to proactively tap into their network connections for support and thus may feel more isolated as a result; especially as HE's broader paradigm shift towards technologization continues. Secondly, there is a gap in the theoretical understanding of university teachers' learning practice, since a significant weight of existing PD literature focuses on NL from a student perspective [8,25–27], as opposed to a faculty one in an ERT context. This partly neglects university teachers who find themselves in this online environment, either gradually as technology seeps into HE campuses or abruptly as a result of future COVID-19-like ERT scenarios [9]. Finally, at the institutional level, universities often prioritize formal and one-size-fits-all PD practices, such as certificated courses or documented observations, at the expense of dismissing more personalized [7], though less visible practices, such as collegial collaboration or the use of online resources. Teachers are thus less likely to put sustainable effort into using and developing their networks without the approval and support of their institution as the ERT fades into the rear-view mirror. This risks failure to carry lessons forward as digitalization continues. The specific focus of this paper is therefore on the challenges that teachers experience in their network interaction, in order to mitigate these in future.

The study's aim is to unveil eighteen Academic English teachers' perceived challenges of using their networks for adopting, and coping

with, the ERT during COVID-19. Using NL as a theoretical lens and phenomenography as inspiration for the methodological approach, this study aims to uncover variation across individual teachers' perceptions and experiences with NL during COVID-19, in a bid to use this unique experience to help teachers better-cope with HE's ongoing transition towards digitization. Even though the investigation was conducted in an ERT setting, the focus is therefore on its implications for the gradual long-term digitalization of HE [8,28].

3.0. Emergency-remote-teaching

Hodges et al. [21] and Cramarenco et al. [9] claim that ERT was born out of necessity at the beginning of COVID-19 in order to differentiate between the hurried struggle to rapidly shift courses that were originally intended for face-to-face delivery to an online format, from the carefully designed courses that are delivered by teachers experienced in online pedagogy. That is to say, ERT is reactionary and improvisational in nature [29], whereas other forms of online teaching are generally planned ahead for [30]. Hence, for the purposes of this investigation, ERT is defined as "the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses, and that will return to that format once the crisis or emergency has been abated" ([21], p.7).

HE programmes that are originally intended for online delivery of some kind, whether this is entirely remotely, using a combination of face-to-face and online delivery as BL suggests [5,7], or by using technology in the classroom to improve elements of a face-to-face course as TEL implies [3], undergo rigorous preparation before the start date [30]. Means et al. [31] describe the range of moderating variables that are considered when designing an online course, including the synchrony of the program (asynchronous vs synchronous) and the pacing (self-paced vs class-paced). The "emergency" part of the acronym, on the other hand, highlights that, in many ways, it is the very opposite of a conscientiously designed course intended for delivery in an online space, since there is little time to consider these variables in advance [22,32]. The rapid and unforeseen shift from physical to virtual learning spaces during the initial COVID-19 period [23], meant that teachers with little experience in online pedagogy were left to deliver improvised versions of their courses online [12,18], that were originally intended for face-to-face settings, using little more than their support networks. It could thus be argued that this recent ERT period produced a stressful scenario whereby teachers were "building the plane while they fly it" ([33], p.193).

Planned online courses in various forms, whether they adopt a BL, completely online or any other format, have existed since the early 1990s [30]. This means that these courses have benefitted from multiple rounds of feedback over the years [34]. They are, therefore, continually adapted and improved [35], and a common understanding among the stakeholders is that the programmes are there to stay in the long term. In contrast, ERT is seen as a temporary measure adopted by institutions to help them cope with an unforeseen event disrupting face-to-face courses [21,36]. The mutual understanding among students, faculty and other stakeholders is that ERT will be used as a crutch, enabling programmes to continue, albeit under a new reality that is assumably less than optimum [9]. The inferior experiences for students and teachers compared to those under the usual physical settings, is often excused by the collective assumption that ERT is a short interim band-aid before returning to "normal."

4.0. Networked Learning

NL exists in an educational context in which different technologies are embedded in HE [37,38] to create a learning space that is flexible [39] and non-binary. Face-to-face course participants are just as likely to collaborate in the virtual world via social media outside the classroom [16] as online course participants are to arrange physical meetups in

today's hybrid HE [7,8]. With this in mind, NL is defined as "Learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources" ([11], p. 1). It is acknowledged that in the last twenty years, "the world has radically changed" (NLEC, p.327, [40]) and that it is therefore important to reflect on the potential evolution of this seminal definition.

A prime reflection is Goodyear's own considerations regarding the inclusion of collaboration and cooperation into the redefinition of NL, as groups of individuals use technology to unite behind challenges [41]. The long-term benefits of technology-mediated teamwork extend beyond merely adding connections to one's list; thus, the new considerations emphasize technology-mediated human relationships more than the connection to online resources. Another important development is the understanding that there may not always be a binary "yes/no" answer as to whether something can be constituted as NL. Instead, Bali, Gachago and Pallitt argue that NL can take various shapes and thus be measured according to different dimensions [38]. A NL experience can be structured or unstructured (facilitated or unfacilitated), but it can be defined as NL in either case. Therefore, rather than questioning the dichotomy of whether a particular interaction might fit neatly under the definition, it can instead be measured against a selection of elements which characterize NL perceptions [38]. In this sense, one can also reflect on Bayne's views on the potential constraint that an over-focus on defining NL can place on researchers as they attempt to pin-down and pick the term apart [40]. Therefore, the simplicity of the adopted definition and subsequently its applicability to this study's PD and HE focal areas [42], is the primary rationale for its adoption.

It is also worth remembering that the focus of this study is not on the technology itself but rather on the way in which it is used to bridge connections [38] and with a focus on the challenges that teachers associate with these interactions. This web of connections is unarguably central to NL [43]; the connections link between an individual and resources as well as an individual and other people; one is not enough to constitute NL [44]. More precisely, technological affordances, such as enabling individuals to quickly share resources through social networked sites like X (formerly Twitter), have already shifted the focus of the connections away from content and pushed it towards connecting like-minded individuals who are likely to share resources and expertise [45]. In this sense, NL emphasizes social learning and dialogue [46] and the complexity of these relationships justifies this paper's specific targeting of teachers' perceived NL challenges.

NL can manifest itself in different forms according to different scenarios and purposes for which individual learners tap into their personal networks. For instance, Lave and Wenger's [47] Communities of Practice (CoPs) concept revolves around the close collaboration of individuals on a common task [48]. Interactions observed in CoPs can look similar to NL, as some can be mediated by technology, especially in the current digitalized society [38]. However, this relatively narrow conceptualization of CoPs, often setting up boundaries around a single intimate learning community, does not embrace NL's broader idea of networked individualism [39,49] that is at the heart of this investigation. This latter concept portrays a different use of networks, whereby an individual dips in and out of a range of wider webs [39]. Technology's penetration into HE [37] means that the use of personal learning networks is likely to take place both online and offline, as technology has now become omnipresent across many university campuses [7,8] and "The differentiation of hybrid versus blended approaches to professional learning can also be considered under a larger umbrella concept of networked learning" ([7], p.57). This research aims to shed light on how the challenges associated with this set of micro-interactions with a wide variety of people and resources over the ERT period [12] have been perceived and approached by teachers, in order to better-comprehend how it can be applied long-after this particular ERT period.

5.0. Methodological framework

Phenomenography is a research approach that seeks to unveil a plurality of ways in which a single phenomenon can be perceived [37, 50]. The methodological focus is on the participants' self-articulation of how they themselves view the subject in focus at that particular time, usually through the channel of a semi-structured interview [51]. While this perception is likely to differ from one participant to the next, some individuals tend to share certain perceptions with others. This results in a finite number of differentiable themes, known as categories of description [52], representing the variation of the participants' perceptions. At the end of a phenomenographic investigation, the structural relationships between these categories are established in the form of visual representations known as outcome spaces [53].

The multi-shaped outcome space in Fig. 1 encapsulates the five description categories derived from the collected data and represents the understanding of how these challenges can be understood through a NL lens. This outcome space does not offer a rigidly linear representation of how every teacher is expected to perceive the challenges associated with NL, nor is its aim to prescribe a precise one-size-fits-all linear roadmap. What the figure below does provide, is a NL-informed visual representation of how individual teachers may perceive the challenges associated with the target phenomenon, depending on their own values and local contextual settings.

While this investigation is heavily based on phenomenography, it cannot be described as purely phenomenographic in the sense that the paper focuses on the variation of the individual experiences of participants, rather than across the interviewees as a group. Also, the emphasis is not on each participant's overall perceptions of the target phenomenon of NL, but specifically on its challenges. Despite these subtle differences, the main reason for adopting a phenomenographically-informed inquiry method for this investigation is not to unveil a single narrative about the NL phenomenon shared among the teacher participants, but instead to uncover a variety of different ways in which these interviewees perceive the same phenomenon [54,55]. It is grounded in the belief that the NL phenomenon has been experienced by individual participants rather differently during COVID-19, when they were physically separated and isolated [9], thus consequently, there should be great diversity across their perceived challenges associated with the phenomenon.

Phenomenography is a non-dualist method [53], which is well-aligned with the constructivist and interpretivist research paradigm employed in this study. A plurality of different "truths" is accepted according to each individual's beliefs, rather than a dichotomy between "good" and "bad" versions. Even for those who reject these ontological and epistemological assumptions by believing that there is only one objective truth, it is difficult to deny the value of having insight into an array of different interpretations. By reviewing alternative perspectives to one's own belief, one may eventually change their own stance [52].

5.1. Data collection

The qualitative data was collected from eighteen full-time Academic English (EAP) instructors at a Kazakh university, all working within a single foundation programme, using a purposive sampling strategy [56], which meant that not all instructors were invited for interview. This is a common approach to participant selection in qualitative investigations, where each interviewee can yield rich information [51,57]. While these local contextual factors may seem niche, the data is widely applicable to other contexts since the purposively sampled participants represent a wide spectrum of different nationalities, experience-levels, qualifications and teaching philosophies (appendix 2). Most important of all, is a reminder that the focus of the investigation is not Kazakhstan, EAP or COVID-19, but on how this specific set of factors can be combined to produce lessons that apply to HE stakeholders grappling with the technologization of HE more widely across a range of local scenarios.

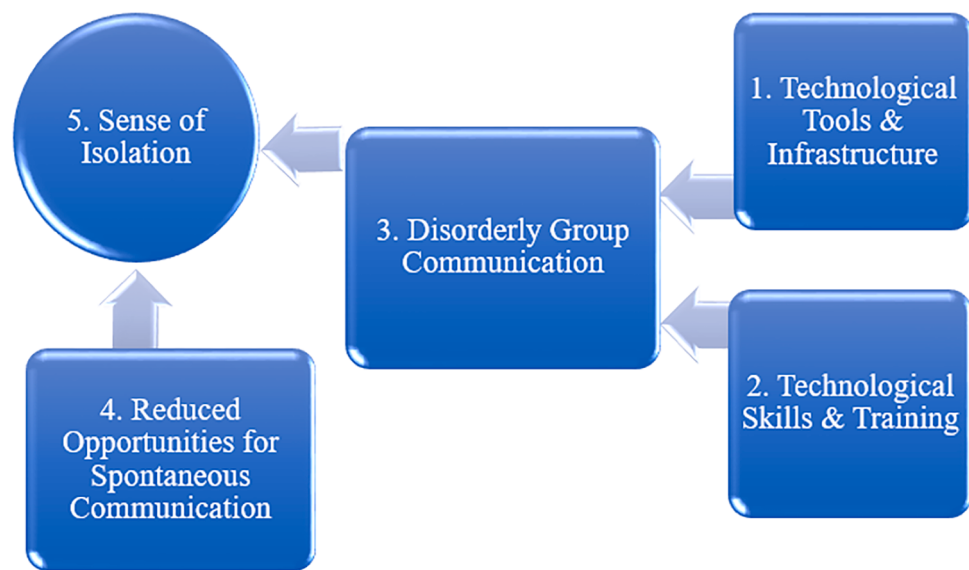


Fig. 1. Description categories

The eighteen teachers, which fits within the recommended 15 to 20 range for phenomenography [58], voluntarily agreed participation in response to an email invitation. After conducting eighteen interviews (Appendix 1), most of which lasted around 45 minutes, data saturation seemed likely as the repetition of themes emerged and thus began the data analysis process.

5.2. Data analysis

Phenomenographic analysis requires the researcher to engage multiple times with transcriptions and produce “qualitatively different conceptions of the phenomenon of interest” ([59], p1). This iterative process [60] means that phenomenographers have to stand back and analyze each participant’s perceptions both individually within the confinements of each separate interview and collectively in relation to the perceptions of the other participants’ interviews [61]. This latter collective interpretation of data is particularly important [37] as similarities and differences in the perception of the phenomenon cannot be identified by merely analyzing each participant’s transcript individually in disconnection from the others. With this in mind, the steps presented in Table 1 do not represent a rigid and linear process. Instead, they highlight a “circular and iterative” process ([62], p.77) in an attempt to be led by the data without relying on pre-existing assumptions.

6.0. Findings

The five themes seen in Fig. 1 represent the relationship in which the obstacles depicted in the first four categories, seen in square shapes, collectively contribute towards the most significant difficulty, which is displayed in the circular shape in the top left hand-side. More specifically, the first two categories do not themselves directly lead to a sense of isolation, but rather combine to cause awkward and disruptive group interactions. This third category of inharmonious online group collaboration, in fusion with the fourth category which depicts the lack of spontaneity in online interactions, combine to cause the most significant perceived challenge of isolation that is presented in the fifth and final description category.

6.1. Category 1: technological tools & infrastructure

The main features of this first description category center on the interviewees’ perceptions that the instruments used for online teaching

Table 1
Data analysis

Step 1. Transcript RQ Summarizing Excerpts	This involved skim-reading each transcript with the target RQs of perceived uses in focus.
Step 2. Tabled RQ Excerpt Comparison	Still within the context of their respective transcripts, summative RQ excerpts were selected from the color-coded data and tabled (appendix 3)
Step 3. Generating Initial Categories of Description	Through the combination of reviewing the excerpts in the tables mentioned above and re-visiting the individual transcripts, preliminary categories of description to represent qualitatively different ways in which the participants could experience the target phenomena were produced.
Step 4. Refining Categories of Description	The preliminary description categories were cross-checked against the information from each transcript, both coded and uncoded [63], in case elements had been missed during the initial coding.
Step 5. Determining Outcome Spaces & Step 6. Determining Structural Relationships	The outcome space (Fig. 1) uses visual cues, such as arrows and shapes, to present how categories are interconnected.
Step 7. Review	This final step involved the revisiting of the transcripts and the tables generated in the previous steps to ensure that the categories and structural relationships were constructed as accurately as possible.

are inadequate in facilitating the recreation of the face-to-face experience that they were accustomed to pre-ERT. This refers to hardware components, such as a laptop or webcam, but also incorporates software programmes, such as Moodle or Zoom. Putting those elements to one side, the most significant contribution to this challenge seems to come from the connectivity, or lack thereof. The interviewed educators perceive that, regardless of the physical and software tools at a teacher’s disposal, they are constrained by the speed and availability of the internet connection that they themselves, as well as the other parties involved in the interaction, have access to. In essence, the teachers believe that they are limited by the tools required for online contact.

I was stressed out in the beginning and... Then I guess that was replaced by frustration... Things like one class might be slow Internet

you know students dropping in and out [of a Zoom meeting] (Participant 4).

That little message I can't connect you know... So we had a... Blank screen, so the disconnection and I don't believe it was always you know intentional, there were very big problems with connections, so you lose students, they miss part of it or they're in and out [of the Zoom meetings] (Participant 9).

6.2. Category 2: technological skills & training

This second description category is related to some of the participants' perceptions that, rather than the physical technology and connectivity itself being the challenge, it is often the teachers' and even the students' lack of training and thus limited understanding as to how these tools can be used optimally that poses the primary challenge. The increasingly growing number of applications with which teachers have to familiarize, and then re-familiarize, themselves with as they are updated is a notable example. This rapid development of technology results in a feeling of never-ending catching up, whereby some educators perceive that as soon as they feel confident with one tool, they will be required to start the process all over again with a new or updated one. Added to this is the perceived concern that there is a significant difference between the roles of professional teachers and online material developers, which means that not all teachers feel comfortable stretching to both roles during the ERT. Lastly, the increased cognitive load on teachers, as they are forced to learn and remember new elements of online technology use, results in the perception that there is an increased likelihood that they make relatively simple mistakes in their day-to-day tasks.

There was some pressure would have come from the technology, especially at the beginning and I'm still working at mastering some of these apps to my satisfaction (Participant 3).

The thing that was most difficult was for me, handling the bulk of digital information... Especially the newer organizational issues, the Google folders [cloud software storage] somehow completely blew my mind (Participant 14).

We had so many technology issues of signals dropping out left, right and centre freezing... People logging on with you know their other email, so their names [on Zoom] were not matched to any names that I knew (Participant 16).

Aside from the technology itself and the training of users, some interviewees perceive challenges associated with the scapegoating of the use of these instruments. Examples of this include more passive students who may find that a "connectivity problem" can serve as a convenient excuse for lack of participation, or technology-resistant teachers who may use the "keeping it simple for my students/colleagues" defense to justify their lack of technology integration.

Face-to-face I think they would have been forced to speak more because they are in class, you know they cannot hide away... or blame technology (Participant 13).

It was quite clear that, there are several limitations, I mean firstly students technology skills, the number of students who actually take part... And what became very clear quite quickly was that the more ambitious, you are with your tech, the less likely, it was that the lesson will succeed, to some extent because... I think the students would just be overwhelmed (Participant 17).

6.3. Category 3: disorderly group communication

This third description category encompasses the participants' perceived challenge in relation to the hosting of synchronous larger

multi-party internet-mediated communication during ERT. Unlike one-to-one encounters, sizeable online meetings are perceived by teachers as being difficult to manage both with students, as well as with colleagues. This category is born out of the culmination of both previous technology-related categories combined. Part of the problem is connected to the notion that attendees cannot simultaneously mingle in a smooth capacity synchronously, which places pressure on the meeting's host to play the role of main actor while others passively listen. This category can be connected to the first description category, in that technological limitations associated with hosting large-scale meetings, which can experience lag as bandwidth struggles to support so many users or are constrained by underwhelming interactive features such as a virtual 'thumbs up.' It can also be linked to the second description category in that there is a perceived lack of expertise and training that some teachers have when it comes to managing numerous synchronous group participants online simultaneously.

Just learning how to run a session with 16 people in the zoom totally I mean remember the first few weeks was rough and this is just this is hard it's hard to coordinate everything (Participant 1).

You can't do that in an open zoom, you can look at a particular person, you can call them by name but that's somehow not enough, I think perhaps you need that actual physical face to face to face eye contact (Participant 15).

The opportunities for interaction and monitoring on the part of the teacher... were probably the biggest challenges and then so yeah just trying to find a way to overcome that and to perhaps apply different types of comprehension checking instruction checking (Participant 17).

A common response in tackling the issue of passive attendance during larger online interactions is for the host to divide participants into smaller sub-rooms within the original meeting; known on the Zoom platform as 'breakout rooms.' However, many interviewees express the perceived challenges that they encounter when trying to manage these awkward virtual spaces. A frustrating sense of tunnel vision is perceived, as teachers temporarily lose complete contact with students or colleagues outside of the particular breakout room that they are in. This is perceived as challenging, in that it makes online interactions feel fractured and disorientating for some teachers, as they struggle to engage with multiple parties simultaneously. Again, this can be related back to the first description category of technological tool limitations, as a teacher's laptop may not have the necessary hardware to enable rapid movement in between virtual rooms. This could also be perceived as skill-related, in connection with the second description category, in that educators may not be up to date with the latest features of the particular programme they are using.

... sometimes doesn't feel the same... And also usually, when they're chatting to you privately, you have to like stop talking and then start writing on the chat in the breakout rooms... let's say we were doing breakout rooms... you can walk from table to table, and you can you can kind of also hear... In the breakout room, you have to purposely go into each one and you can't monitor what's happening outside (Participant 6).

You weren't 100% sure that they were fully engaged, they drop in and out of the zoom... the ability to manage and control the class is a little bit more difficult... the idea of going into a breakout room then you're obscured from all the other students who are in other breakout rooms... you're unable to monitor them, whereas, even if you join a group, a small group in a classroom and you're able to monitor what's going on around you (Participant 11).

Some of the participants express that the challenges they associate with larger online meetings are not necessarily a result of inactive participation, but rather on account of the over-active participation of

some attendees. They perceive that ICT-mediated group interactions during the ERT period have generally been more time consuming, which is partly attributed to the trial-and-error approach to technology, but also to 'platform-hogging' by some individuals looking to vent in front of an audience. This results in an increasing level of resistance to group online interactions by faculty members who perceive this as not being the most productive use of their time. Aside from software interactivity limitations that require users to simply sit and watch, rather than enabling additional forms of active engagement while an individual is speaking for an extended period, this could also be perceived as (lack of) training-related, in that not all teachers may be aware of concepts such as "Zoom fatigue." Hence this can also be connected back to the first two description categories.

The meetings which I'm obliged to attend and I find that... I don't like them, because I find that some people have to boast they think out loud they don't express their ideas clearly they intrude on other people's time unnecessarily (Participant 2).

During our large meetings I feel like a lot of time is wasted, you know, on first of all, the small chitchat at the beginning... You know people kind of talking about not always relevant things in and I felt like you know you could email each other and talk about that privately... whereas in a small group like... fewer questions you know quick answers and off we go (Participant 13).

6.4. Category 4: reduced opportunities for spontaneous interaction

This fourth description category is based on the interviewees' perceptions that their engagement with others, be it colleagues or students, has become overly planned and rigid. The need for an agreement on a time and date, along with the laborious process of scheduling an online meeting contrast starkly with the informal micro-conversations that take place in an offline environment, whether it be in the office, staff room or corridor. The challenge perceived by the participants is thus partly to do with the inability to replicate these spontaneous "water-cooler" interactions in the online medium during ERT.

When you're in your offices there is more of... instances where you would run into different colleagues, you see them, you have small talk so that obviously did not happen at all now, I mean I'm in a room all by myself (Participant 1).

Physical human interaction, as you know, I go out for walks every day and then bumping into people as... You know I haven't seen you since last summer... and I just found it kind of disturbing, I'm not seeing people (Participant 4).

I think the missing informal element that you would have... if you pop in to see someone in their office or you meet them in the corridor is certainly missing (Participant 11).

When walking into work when I don't know grabbing a cup of coffee just meet in the hallway so like people come into the office or we go into other people's offices... So I don't think that we have that (Participant 12).

Some teachers express the difficulty they associate with the newly added burden of having to initiate informal conversations with others during the ERT period. Through their eyes, something that used to be relatively effortless, such as touching base with a colleague over a coffee in the staff room or enquiring about a student's welfare as they pass by in the corridor, has now become a comparatively arduous task that not only involves multiple programmes such as Zoom and Google Calendar, but also the confidence to initiate what now feels like a much more formal encounter. This appears to have resulted in some of the less confident teachers simply having to make do without this phatic talk that they relied on for bonding in the pre-ERT period.

It's harder to quickly contact co-workers for a question you know when we're in the online space, you can't just turn to somebody and ask (Participant 6).

If you're on your own... yeah you'd have to make a real effort to keep in touch to bounce ideas it's that informality of the office chat... You know those informal little interactions with officemates are invaluable to building your own confidence and making sure everyone's doing the same thing... And that's missing, and I think you're on your own (Participant 9).

You would regularly meet for coffee and a chat and so on, but unless you go out of your way to initiate that it doesn't sort of happen regularly and that can be quite difficult... this online thing can be difficult to which can create pressures which spill over into your professional life (Participant 15).

Some of the interviewees go as far as distinguishing between 'colleagues' and 'friends' when elaborating on who they have stayed in contact with informally whilst working from home. They perceive that the lack of spontaneity in engaging with others that is associated with online teaching has had more of an impact on reducing communication between more distant colleagues. However, interaction between colleagues who share a closer personal friendship seems to have been less affected. This means that teachers perceive that they have magnified contact with close connections, but reduced contact with distant ones during ERT in comparison to during face-to-face operations.

Being in the office there were there was a certain amount of support involved that wasn't quite replicated online in part, because the communication through social media was based more on friend groups than officemates... colleague chat was more beneficial to keeping track of information different attitudes towards approaching things organizing things... Whereas a friend group we're sort of like minded and an equally faulty in the way we handle details (Participant 14).

6.5. Category 5: Sense of Isolation

This fifth and final description category represents the most significant challenge perceived by teachers in their use of networks during the ERT period. This takes into account the culmination of the comparatively minor stand-alone challenges represented in the previous four categories. When combined, these difficulties ultimately lead to a perceived sense of disconnection between teachers and both their colleagues as well as their students. It is important to note that, while the first two technology-related categories do not themselves directly lead to this sense of diminished bonding with others, their negative impact on the disrupted virtual group communication, described in the third description category, does. Therefore, it is this third category, combined with the previously described theme of diminished spontaneous communication, that directly lead to this ultimate sense of isolation that is perceived by teachers. Despite not all participants being able to pinpoint precisely what caused this lack of connection, the consensus remains that person-to-person bonding has been a prominent challenge throughout ERT.

The gallery view [on Zoom] isn't much different to that, quite honestly, and of course they can talk and see each other, but it just doesn't work the same, the human contact was missing (Participant 2).

The physical proximity there is something existential there in a way, I think it's something to do with our nature, we are, we are creatures of flesh and blood (Participant 3).

Often you can't even see what they're really thinking you can't see if they've got what you're saying... it's just very hard to create those bonds (Participant 7).

It just felt like it was all online and yeah I got I felt very frustrated I didn't have like any motivation, or like willingness to do anything else online... I thought online courses for me it feels isolated (Participant 18).

Other teachers are more specific in attributing the causes of their feeling of disconnection from others. On the surface, it appears that teachers are quick to blame technology and connectivity limitations for this lack of cohesion between themselves and others. They perceive that individuals are generally less willing to actively participate online and thus less likely to form and maintain bonds with others.

I don't know the classroom you know they [students] hadn't gelled properly there wasn't a classroom dynamics really because few students turned on their cameras (Participant 8).

I don't get to know them that well I don't know their personalities that well or, for example, some students I don't see that often... face to face I think they would have been forced to speak more because they are in class, you know they cannot hide away or switch off the camera you know or blame technology (Participant 13).

Reviewing the transcripts more closely, factors outside of the technological limitations can be noted. For instance, some teachers perceive the lack of back-channeling feedback, such as a nod or eye contact, to be important when establishing rapport. These cues are clearly perceived to be more challenging to replicate in a larger group meeting online.

I missed that eye contact, because sometimes I'm in the classroom we can even get someone's attention that way, maybe they're kind of zoning out... You can you can check comprehension that way you can see some light in their eyes... But when you're in a zoom just go dead face when you're listening... you just don't know that anybody's looking at you (Participant 6).

Lastly, the lack of regular, informal contact between teachers and others was noted as a significant cause of this state of diminished rapport with others. A notable example of this arises from teachers' perceptions that they barely know some of their teaching groups. Pre-ERT, they may have met some of these students in the corridor or elsewhere around campus. However, during the online teaching period, their synchronous contact is limited to short weekly Zoom meetings.

It was definitely different with the with the listening and speaking [a class taught within the EAP course] because we only met with our listening speaking class... One time a week or 30 minutes honestly I can't even tell you one student name (Participant 1).

You didn't get to know the second group [listening/speaking class]... But you know you just get a half an hour a week in which other world would you have a class of 16 students for half an hour a week, it makes no sense at all (Participant 2).

7.0. Conclusions

This research tackles the practical, theoretical and institutional challenges outlined at the beginning of the paper. Provided that the challenges described in the previous section can be overcome, or at least mitigated, a range of benefits stand to be reaped from NL as HE continues its shift towards technologization [24]. Firstly, digitally-facilitated networks enable university teachers to better utilize online connections and can notably enhance their own learning and teaching. Such networked interaction can mitigate immediate challenges teachers encounter in unexpected calamities such as COVID-19. More importantly in the longer term, such networks can help teachers adjust to the gradual slide towards increasingly digitized HE contexts. From a theoretical stance, this research has spotlighted how NL has been perceived particularly by teachers who could not (did not) adopt a paradigm shift towards technology-enhanced teaching and learning

before the ERT period, when they were suddenly pushed into the unfamiliar online space by the abrupt event and the challenges they faced. Lastly, this research steers institutions towards adapting their overall approach and attitude towards PD, in order to exploit the NL opportunities that have come to surface throughout the ERT period in question.

One key take-away that can be extrapolated from the aforementioned themes is that, in parallel with the evolving definition of NL, the process of digitally-mediated collaboration is often motivated by a shared sense of challenge [38]. Obstacles ranging from inadequate communication tools to a more abstract sense of disconnect are not experienced on a purely individual level by university teachers, but can instead be perceived as a collective challenge that motivates individuals to engage in NL to help overcome these challenges as an entire faculty unit. This notion of communal challenge is less applicable to the first three themes described above, since new tools can be acquired and training can be arranged at individual level to ultimately improve the quality of larger group interaction. Individual teachers have a sense of agency over these tools and training. However, the lack of spontaneity and sense of separation from others that is characteristic of an online medium [64] is experienced as a notably more shared challenge that requires group coordination. The tackling of increasingly complex obstacles such as this [65] is therefore more dependent on what Cutajar describes as the communal act of "trying to build the aspired trustful interhuman relationships" ([38], p.347). Again, the complexity of these challenges [65], most notably lack of online spontaneity and an ultimate sense of separation from others, call for reciprocity between colleagues as the shared sense of challenge that can only be tackled at the collective, rather than individual, level. A teacher is unlikely to overcome the rigidity of the online space and the sense of isolation this can bring by merely upgrading their equipment or partaking in an online conference, but is instead more likely to find a solution by building collaborative bridges to networked communities.

As far back as 2021 when HE gradually began to leave COVID-19 in the rear-view mirror, educators have been working hard "to transform an emergency response into a cohesive and planned learning experience" ([38], p.354). This means that, looking forward, teachers should continue to shift their focus away from NL in an ERT context [9] and further towards a "new normal" that once again draws its strength from planning and preparation. This transition should not result in a mere reversion back to the pre-ERT status quo, but should instead aim to carry forward important lessons learnt throughout this online period [12,28] as to the challenges that teachers associate with NL and how these can be overcome. Teachers should therefore utilize their personal networks proactively in planning ahead for future challenges, rather than simply leaning on NL reactively as a temporary crutch during ERT periods such as COVID-19. NL's steadily growing recognition as a valuable form of PD [12], albeit still slowly, should facilitate teachers' digital collaboration and thus help to minimize the challenges outlined in this paper. The higher order challenges of isolation and reduction in spontaneous interactions in particular are hurdles that teachers can begin tackling today, as this will not only strengthen their position in the next ERT period but also enrich their performance as educators in an increasingly technologized environment [28]. Therefore, the stronger a teacher's personal networks are today, both in terms of number of connections as well as the familiarity with these nodes, the better prepared they will be proactively for tomorrow's challenges.

Finally, it is pertinent to note that, despite the wealth of themes explored in this study, there are notable limitations. The investigation was constrained by the fact that it was conducted throughout the COVID-19 ERT period, which has limited face-to-face contact with participants and thus made the extraction of the themes more challenging than would have been the case under ordinary circumstances. In addition, the investigation was subject to temporal restrictions attributed to there being a single investigator, which means that it was limited to 18 participants in terms of the amount of data that could realistically have been analyzed during the timeframe of the investigation. Lastly,

the credibility and trustworthiness of the results could arguably be vulnerable to researcher bias, given the qualitative nature of the data collection. These limitations are qualified firstly by the availability of reasonably dependable conference software, such as Zoom or Skype, that facilitated both the interviews themselves as well as the general coordination with participants. Secondly, the investigator benefitted from the support network of his recently completed doctorate, including his thesis supervisor, as well as that of his work colleagues. This significantly alleviated the temporal challenges, such as sampling, since the author was able to consult this network to help overcome hurdles in a more time efficient manner. Lastly, the researcher's data analysis precautions, including the blind peer review of data analysis segments by a colleague, have helped to strengthen the reliability of the findings. These qualitative themes can also be tested against future quantitative investigations that focus on the longer term implications of ERT and NL

using larger samples.

CRediT authorship contribution statement

Alejandro Acuyo Cespedes: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix 1. - Interview protocol

Questions	Notes
1. Overall, how has the recent ERT period been for you? Would you describe it as a positive/negative/mixed experience? Why?	1. This is an easy to answer lead-in question to put the participant at ease, but also to activate their schemata with regards to ERT and NL.
2. How did you go about learning and teaching during the ERT period? Can you provide an example as to how this has differed from the face-to-face learning and teaching that you experienced before the recent Covid lockdown?	2. This is a deliberately broad question that gives the participant freedom to discuss any aspect(s) of their learning/teaching practice during the ERT period that they deem prominent.
3. Can you tell me more about your interaction with other people during this period? Have you collaborated much with others?	3. This targets the participant's connections to other people within their networks (RQ3).
4. Can you tell me more about your use of online resources during this period? Have you used much online material?	4. This targets the participant's connections to online resources within their networks (RQ4).
5. Reflecting on your engagement with other people and with online resources throughout this ERT period, what do you perceive as having been most useful or helpful for your learning and teaching?	5. This specifically focuses on network practice(s) that the participant feels have helped their learning and teaching in some way (RQ1).
6. Thinking about the other side of the coin now, could you describe any challenges or obstacles that you have encountered in your engagement with other people and online resources? Anything that hasn't really helped your learning and teaching?	6. This specifically focuses on network practice(s) that the participant feels have not helped their learning and teaching in any particular way; or have perhaps even hindered it (RQ2).
7. Before we conclude the interview, is there anything else that you would like to add about what we have discussed?	7. This is a wrap-up question to ensure a smooth closing of the interview, that also acts as a final opportunity for the participant to add anything else related to the topic.

Appendix 2. - Participant spread

Participant	Gender	Age Category	Experience
P1	M	32 to 45 years	5 to 10 years
P2	M	46+ years	10+ years
P3	M	46+ years	10+ years
P4	M	46+ years	10+ years
P5	F	32 to 45 years	Less than 5 years
P6	F	Less than 32 years	Less than 5 years
P7	M	Less than 32 years	5 to 10 years
P8	F	32 to 45 years	5 to 10 years
P9	F	46+ years	10+ years
P10	F	32 to 45 years	5 to 10 years
P11	M	46+ years	10+ years
P12	F	Less than 32 years	5 to 10 years
P13	F	32 to 45 years	10+ years
P14	F	46+ years	10+ years
P15	M	46+ years	10+ years
P16	F	32 to 45 years	10+ years
P17	M	32 to 45 years	10+ years
P18	F	Less than 32 years	Less than 5 years

Appendix 3. - Data analysis coding sample

transcript

RQ1 - Perceived benefits - Blue
 RQ2 - Perceived challenges - Red
 RQ3 - Connections to other people - Green
 RQ4 - Connection online resources - Orange

1
 00:00:05.400 → 00:00:14.519
 Interviewer: alrighty so thank you for agreeing to take part in this optional interview about network learning during this recent covert ERT [Emergency Remote Teaching] period.

...
 2
 00:00:14.969 → 00:00:24.480
 Interviewer: And I'd like to know more about your teaching and learning activities throughout this period in terms of how you may have engaged with other people, as well as with online resources.

...
 182
 00:23:04.230 → 00:23:11.430
 Participant: So so just I guess just to give some examples

Participant: So so just I guess just to give some examples Padlet I use Padlet a lot of course I learned that from the course so.

so.
 183
 00:23:13.200 → 00:23:20.700
 Participant: I

Participant: i've been using some corpus basic corporate sketch engine more or learn about it than i'm used to.

more to learn about it.
 ...
 184
 00:23:22.710 → 00:23:39.150
 Participant: I think in oh yeah then of course

Participant: I think in oh yeah then of course feedback was a big thing, so I have an audio feedback to be asked, I can't remember what it's called then i'm screen castify if I use it for video feedback on what what what I have used that if I was.

[on my students' online written assignments]

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