The COOL e-Research and Researcher Development Experiences: A Mentor and Mentee Perspective

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Abstract: As information and communication technologies (ICTs) continue to advance, research projects and processes increasingly adopt ICTs, and terms like 'e-research' gain popularity. However, disparities in access to ICTs and users' technology proficiency affect the adoption of e-research technologies. Despite these constraints, the COVID-19 pandemic forced many researchers (including postgraduate students), in diverse and unequal contexts, to take their research activities online. This paper reports on the 'e-research' experiences of the principal investigator, a research mentor and a researcher after the adoption of ICTs during the pandemic. This research took place in the context of the Cases on Open Learning (COOL) research project, commissioned by, and conducted jointly with, the Department of Higher Education (DHET) in South Africa. This was a multi-researcher (10 researchers located across the country, with varying degrees of research experience), multi-site qualitative social science research that took the form of 15 case studies, conducted across seven technical and vocational education and training colleges, six universities, two DHET sites, and a desktop study. The national lockdowns that were announced shortly after our first and only face-to-face project meeting forced us to conduct all aspects of the project entirely online. We used the Google suite for collaboration and Zoom for COOL team building, researcher knowledge and skills development sessions, and online interviews conducted by the researchers. WhatsApp played a dual role – supporting ongoing communication within the research group, and as a data collection tool. The paper highlights our experiences on what it meant to be part of a research team, as well as the opportunities and challenges of conducting research of this nature. It shed light on the COOL team building and researcher development strategies. Drawing on insights from our experiences, we recommend that higher education institutions (HEIs) develop both technical and human-oriented guidelines for conducting e-research. This paper could provide insights for independent researchers, postgraduate students, principal investigators, and supervisors considering a cohort-supervision model, comprising diverse students, who may be in dispersed geographical locations.

Keywords: Covid-19 pandemic, e-Research, Information and communication technologies, Mentoring, researcher development

1. Introduction

There is an increasing interest in how to conduct research across geographically distant spaces with research teams with a diversity of experience and skill. This paper draws on the experiences of three participants from the Centre for Innovation in Learning and Teaching (CILT) at the University of Cape Town (UCT) in the Cases on Open Learning (COOL) project, commissioned by the Department of Higher Education and Training (DHET). The COOL project was a multi-researcher, multi-site collaborative research project, conducted fully online during the COVID 19 pandemic. One of the project aims was capacity development for young and emerging researchers, many of whom faced challenges relating to connectivity, access to software, and conducive work contexts, challenges heightened by their standing as contract employees. Furthermore, as the project adopted a social justice framework for analysis, we were determined to design a collaborative research project that, in addition to reaching a successful completion, would function in socially just ways.

This paper describes the entanglement of the research process, practices and technologies in response to the challenge of completing the COOL project during the pandemic, as an illustrative case. Drawing on research process models from the literature, we present a description of the e-research process undertaken by the COOL project, based on the experiences of the principal investigator, a research mentor and a researcher.

2. The Story of the COOL Case

The COOL project was commissioned by DHET in March 2019, initially scheduled for completion in December 2020. The project, as conceptualised by DHET, required the successful achievement of two outcomes: (1) the development and dissemination of case studies to demonstrate the uptake of open learning in the Post Secondary Education and Training (PSET) sector, and (2) the strengthening of the capacity to research open learning through the development of a cadre of emerging researchers.

Successful achievement of the first outcome required that we describe the extent to which the notion of 'open learning', as defined by DHET in the draft Open Learning Policy Framework (2017), was being taken up by various

PSET institutions. DHET nominated a selection of topics and sites, allowing the core research team some leeway in identifying additional sites and topics of interest. The project culminated in the study of seven TVET sites, six university sites, two DHET sites and one desktop. A broad range of topics including leadership, online assessment, blended and online learning, student support, fundraising and staff development were nominated as areas of interest.

In order to address the second outcome, we were required to hire a representative and diverse group of researchers, taking into consideration geographical location, institutional affiliations, race, gender, age, and home language. The final research team for the project was composed of ten researchers: nine of whom were early-career or newly established researchers, with one highly experienced researcher being brought in later in the project. The research team comprised Masters and doctoral students, post-doctoral researchers, and two staff members from other institutions. Team members came from a variety of human and social science backgrounds, including education, law and urban planning. The research team was based across five provinces, in urban and semi-urban locations, lived in varying circumstances – alone, with family, in residences and had different levels of access to internet connectivity. Furthermore, many of our researchers experienced some degree of financial insecurity or uncertainty, as they were either on limited student-funding or self-employed and the project remunerated them on a paid-on claim basis.

Given the scattered location of the sites, the research team and the financial limitations of the project, the COOL project had, from the outset, been designed to draw on digital resources, tools and platforms, as well as strategic face-to-face activities such as three whole team meetings and site visits to successfully complete the project. However, even with the comprehensive risk analysis conducted at the beginning of the COOL project, no-one anticipated a pandemic. As the project was funded through DHET and European Union grants, cancelling or suspending the project would have required the return of funds. Furthermore, as was the case with other research projects at the time (see, for example, Yan, 2020 and Buckle, 2021), cancelling or postponing the COOL project would have compromised our researchers' already precarious living arrangements, expected knowledge contributions and research careers. Taking this into consideration, the project team redesigned research and support activities to accommodate lockdowns and to take advantage of the affordances of digital tools and the project deadline was extended to December 2021.

In the next section, we draw on literature that explores researching with technology and developing researchers at a distance, to contextualise our experiences and practices during the COOL project.

2.1 Researching With Technology and in Digital Spaces

The terms 'e-science', 'cyberinfrastructure' and 'e-research' represent three key traditions in researching with technology and digital spaces. While initially emerging from different geographical and disciplinary contexts, overtime, these traditions have converged, broadening their scope beyond their original focuses (Koschtial, 2021; Jankoswki, 2009).

'E-science', commonly used in the United Kingdom (UK) and Germany, was introduced by John Taylor, the then Director General of the UK's Office of Science and Technology, in 1999 in a bid to obtain funding for e-infrastructure developments, which later give rise to the UK's e-science programme. 'Cyberinfrastructure', commonly used in the United States, emerged from a 2003 commission report funded by the National Science Foundation (NSF). Jankowksi (2009) observes that within the e-science tradition, Internet and computer technology is seen as a key tool to transforming the scientific enterprise, while within the cyberinfrastructure tradition, "the development is seen as parallel to the infrastructure already integral to modern societies".

'E-research', more commonly used in Europe and Australia, emerged in 2005 through an initiative of the Australian Research Council. Research within this tradition sees a disciplinary shift towards the social sciences and humanities (Jankowski, 2009) and a focus on the use of computing infrastructures within the academic domain (Schroeder, 2007). Unlike e-science, which prioritises high-speed computing for large datasets, e-research "places weight on incorporation of a wide variety of new media and electronic networks in the research process" (Jankowksi, 2009). The tradition has tended to focus on e-collaborations (Mohamed et al, 2013) and open initiatives (Schroeder, 2007).

The relevance of e-research became apparent during the COVID-19 pandemic, where lockdowns substantially interrupted traditional research approaches. Field- and lab-based research was interrupted (see, for example, DeMatthews et al, 2020 and Kroenke et al, 2021). Due to lockdowns, even desktop researchers were unable to access libraries (see, for example, Alam et al, 2021). Contract researchers were plunged into conditions of financial precarity (see for example, Park, 2020 and Yan, 2020). Under a range of pressures, scholars turned to

a range of technological solutions to continue their research. For example, video conferencing platforms were used for qualitative data generation (Lobe et al, 2020; Roberts et al, 2021; Shepperd et al, 2021). Virtual methods are noted to produce data comparable in quality to in-person interactions (Shepperd et al, 2021), while offering logistical benefits, such as, recruiting geographically distant populations (Roberts et al, 2021) and facilitating the ease of managing and conducting telephone interviews (Buckle, 2021).

2.2 Developing Researchers in a Distance Context

The scholarship of researcher development beyond the formal postgraduate supervision space only surfaced over a decade ago. Evans (2011) defines researcher development as "the process whereby people's capacity and willingness to carry out the research components of their work or studies may be considered to be enhanced, with a degree of permanence that exceeds transitoriness". She intentionally uses the term "people" rather than "researchers" to include anyone who could be transformed into a researcher in the process of development (Evans, 2011, p. 82). For instance, Nguyen (2012) noted that "there has been lack of focus on the development of other sub-groups such as practitioner-researchers, research staff, academics, early career researchers, and other constituencies contributing to the development of people as or into researchers". From a postgraduate supervision context, Albertyn, van Coller-Peter and Morrison (2018) explore the three perspectives of researcher development: research education, relational support and personal engagement. Research education involves the acquisition of research-related knowledge, skills, and competencies, where the most appropriate pedagogy embraces learning by doing research. With respect to relational support, they emphasise the need for researcher support as they internalise and assimilate research-related knowledge. These authors acknowledge that "the adult learning process is enhanced when it moves to a participatory one, where change is fostered in the company of others" thereby drawing on the notion of situated learning and communities of practice (Albertyn et al, 2018). Furthermore, personal engagement is about how one's perceptions about, or attitude towards research (Evans 2011) and their agency could potentially enhance change and development (Albertyn et al, 2018).

Developing early career researchers can pose challenges when research teams are geographically dispersed (Mbuagbaw and Thabane, 2013). The use of independent, contract researchers can exacerbate an already complicated situation.

3. Method and the Authors

In writing this paper, we drew on the experiences of three members of the COOL team who were involved in the COOL research project in three different roles (PI, mentor, mentee) and are now all employees of CILT at UCT. When we initially started writing the paper, we engaged in a collective remembering and reflection process – reviewing a range of artefacts created during the project. Examples of artefacts included are recordings of training sessions, weekly research team, and core team meetings, outlines of protocols, document templates, emails capturing group decisions, researcher-generated texts, voice, and text messages via Whatsapp, slides and drawings.

Initially, we engaged directly with these artefacts to reinvigorate our memories of the project and the circumstances surrounding it. On an examination of the literature, we encountered the notion of collective memory, described as a multidisciplinary research method integrating insights from psychology, sociology and cultural studies (Orianne and Eustache, 2023). Our ground up practice, of collectively engaging with artefacts such as emails, and sharing our individual memories, echoed the intentional methods of collective remembering. According to Orianne and Eustache (2023), collective memory "is not the memory of the collective, but that of its individual members, as either members of social groups (shared memory) or as participants in social interactions (collaborative memory)".

As we worked through our recollections of the project and engaged in an informal process of remembering together, we realised our choices were being directed by methodologies we had used in other contexts. We were strongly influenced by some of the concepts underpinning ethnographic research. Ethnography provides a powerful approach to learning about complex social phenomena (O'Reilly, 2021), such as the undertaking of research, while providing useful tools for thinking about the relationship of researchers to the field of study. Through our varied participation in the COOL project, we had had a range of opportunities to participate in the research life of the project "for an extended period of time, watching what happens, listening to what is said, and/or asking questions through informal and formal interviews, collecting documents and artefacts - in fact, gathering whatever data are available to throw light on the issues that are the emerging focus of inquiry" (Hammersley and Atkinson, 2019). Through a redefining of the notions of 'insiderness' and 'outsiderness', we

drew on the work of McNess et al. (2015) to understand how, as COOL researcher team members, we might move between various insider roles, and as authors of this chapter, outsider roles. Additionally, we drew on concepts, such as, that of the "interpretive bricoleur" (Kincheloe, 2011) and "patchwork ethnography" (Günel et al, 2023) used in ethnographic ways of working, as we worked iteratively with this range of data and each other, to make sense of our experiences.

3.1 Towards an e-Research Framework: Mapping the COOL Research Process

While there are substantial differences in researchers' practices, including varying positions on questions of ontology, epistemology and methodology, a common research process may be identified. Multiple authors including, Lê and Schmid (2022), Jankowski (2009), and Bordens and Abbott (2002) disaggregate the research process in varying ways. Our work closely aligns with that of Jankowski (2009), Herrington et al (2007), Bordens and Abbott (2002), who link practices and tools to research phases and activities. By consolidating these models in the context of qualitative social science research, we understand our experiences through a five-phase model, underpinned by communication, team building and administrative activities. Phase one outlines the focus of the study, develops research questions, locates the researcher, plans the research process, considers ethical concerns, and gains the necessary institutional approvals for access. The second phase takes the researcher into the field of study either through actual field work, desktop studies or data generating activities in a controlled or semi-controlled environment. This data phase is often followed by, but may also exist simultaneously, in online versions of certain traditions such as ethnography, with the phases of analysis, representation and dissemination. Figure 1 illustrates our research phases.

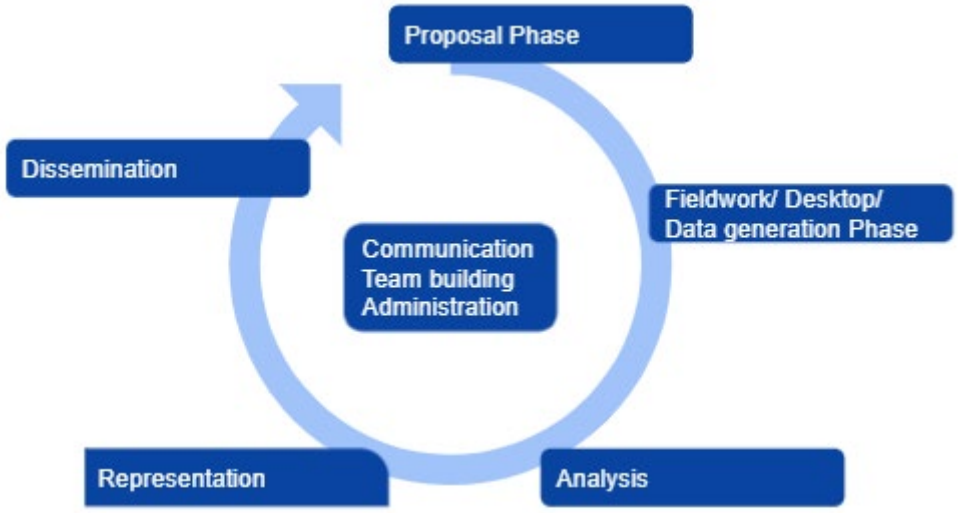

Figure 1: COOL Research Phases

In the context of the COOL project, having a strong focus on communication, team building, and administration was crucial. Furthermore, we located some elements of the research processes differently to the models - such as foregrounding ethical choices and researcher positionality as key elements of the proposal process. Finally, language such as reporting in the models tends to have positivist connotations, so we have used 'representation', drawing on the work of a tradition of sociologists and ethnographers (e.g. Adler and Adler, 2008), allowing for more partial, contingent and emergent writing about the research experience.

4. Practices and Tools

The next section explicates the five phases, highlighting the practices that developed in the project over time, and connecting these to the tools that enabled us to engage in these ways.

4.1 Research Proposal and Design Phase: Research Conceptualisation, and Scoping

Between March and September 2019, the project team at UCT developed a research proposal, consulted the DHET Open Learning Directorate on the identification of research sites, and subsequently, conducted scoping interviews to elicit whether there was reasonable substance to research at the various sites. The project PI and an experienced researcher conducted site visits (in Cape Town), recruiting phone calls and e-mails, and visited institutional websites. The contract researchers were recruited in September 2019 and, drawing on the initial

scoping process above, each developed a research proposal for their case studies. To support this, we paired researchers with a mentor, tasked to develop a relationship with their individual mentees. The proposal development process was supported by project mentors, and the PI and project team through individual consultations and group online research training session. Researchers subsequently wrote their proposals in Google Docs and received feedback from their mentors and the PI via Google Docs and verbally.

4.2 Research Team Building

Team building, defined as the drawing together of "a disparate group of people united by certain objectives, cohesive and effective team working" (Nikitenko et al, 2017), is widely viewed as a necessary activity. The COOL project extended its understanding of team building beyond simply cohesive and effective team working to the development of a research community and of researcher positionality around two issues: open learning and social justice in the PSET sector.

Initially we had planned to meet three times in Cape Town for team building and project activities and had expected that our contract researchers would be able to work from their affiliate institutions, accessing stable internet and conducive working conditions. In the end, we were only able to host one meeting before the Covid pandemic required a national and extended shutdown; at which point, some of the contract researchers who were also students in residences were sent home. This posed substantial challenges for team building, which we viewed as essential to the success of the project.

In order to meet weekly on Zoom, we had to address a number of operational and learning needs. We provided our researchers with portable modems and a monthly data allowance to support internet connectivity. Many of the required online activities required stable internet connectivity - permitting the simultaneous use of Zoom with collaborative software such as Google docs or web-based participation software such as *Mentimeter*. However, we quickly discovered that many of our team members would join the weekly meetings via their phones rather than computers, making engagement via alternate browser-based activities unstable, and challenging for team members with limited digital literacy to navigate. The live sessions became more like presentations, with interaction being limited to voice or chat, and other research and team building tasks happening before or after the session.

Whatsapp became a key tool for social support and communication, strengthening team cohesion. Most mobile operators in the South African context offer preferential data access bundles for social media platforms, making Whatsapp a cheap and popular choice of tool for 'light' communications. Reminders of meetings, links to additional resources, birthday greetings, condolences and wishes for speedy recovery, all made their way onto the Whatsapp group, which became a key site for mutual support and affirmation.

4.3 Fieldwork: Data Generation During COOL

Initially, we planned to elicit student quantitative data through questionnaires and visit the research sites to elicit qualitative data in the form of one-on-one interviews with staff research participants and focus groups with students. However, the national lockdown and social distancing requirement meant that residences were vacated, and in-person research could no longer be conducted, making the likelihood of the successful use of student questionnaires unlikely. In the end, the questionnaires were eliminated, and all the studies became qualitative in nature, instead of the initially planned mixed-methods approach. Once ethical clearance was granted, gatekeeper permission was sought to conduct research at the universities, while DHET granted this for the TVET colleges.

The data was generated between July and December 2020. Some rapport with the participants had already been built through scoping and contact with the research sites before the pandemic. The PI and the project manager sent emails, made phone calls and even WhatsApped potential participants, located in different provinces, to invite them to participate in the research. Administrative personnel were very helpful, for instance where the principal or contact person had retired (between the scoping and data collection stages). All the researchers used Zoom for staff interviews and the three researchers who conducted focus groups with students used WhatsApp in addition to Zoom. During the interviews, Zoom's video conferencing capacity enabled researchers to build rapport through being able to maintain eye contact, and display encouraging and attentive body language as they would do in a face-to-face interview. This enabled discussions similar to what one might expect in an in-person interview. Additionally, the use of digital technology for data generation enabled us to interview geographically distant participants. For example, one researcher was able to interview three international participants through Zoom.

As has been found by other researchers (see for example Shepperd et al, 2021, Lobe and Morgan, 2021 and Roberts et al, 2021), lack of access to devices and varying levels of digital literacy impacted on our project. In the COOL project, a Zoom account was created for all the researchers. Most of the researchers were able to manage their Zoom accounts, setting up interviews on their own; however, there were instances where a researcher lacked the required level of digital literacy to set up and manage settings during the interviews. In such instances, the project manager set up the interviews on the researcher's behalf and joined the interviews to assist with technical issues that could arise.

We anticipated our student interviewees would require support with data and hence provided them with data for the interview. We initially debated whether to offer them WhatsApp bundles or data, but ultimately gave them data so they could be reachable in case a researcher had to WhatsApp call them. This worked smoothly except for one case, where the student used up the data before the focus group took place and we had to top it up.

Consent is commonly obtained via email prior to conducting virtual research (Lobe et al, 2020). However, like Sy et al (2020) and Robert et al (2021), we realised that our participants had varied levels of technological proficiency. Hence, we allowed for different approaches to obtaining consent. For instance, some participants could not append their digital signature on the electronic consent form we sent, so in some cases, participants printed, signed and emailed us the consent form. In one instance, the researcher adapted the Word document into a Google form and asked the participants to give consent to participate by checking a box. In cases where the engagement with the participants were done through Whatsapp, the consent form was sent as screenshots. Through the edit mode in picture settings, the participants ticked and filled in the consent form accordingly. For participants who did not know how to access the edit mode, we allowed for the participants to respond through a message text detailing that they consent to the research.

Traceability is a key concern as "digital data holds the possibility of locating and identifying participants, sites, social interactions and the ethnographer herself, and makes particular issues such as anonymity, visibility, exposure, ownership and authorship especially prominent" (Beaulieu and Estalella, 2012). For example, at two researcher sites, to the surprise of the researchers concerned, a senior manager brought along a colleague to the Zoom interview – these raised concerns about traceability as multiple interviewees were now exposed to each other's comments. We opted to treat these interviews as interview couplets, being careful about what questions we could ask under the circumstances. In another case, with student Whatsapp focus groups, student participants were requested to treat the focus group as confidential and were alerted that full anonymity was not possible in such a context. Another risky context for traceability concerns was transcription. We sent the Zoom audio recording for transcription to two reputable transcription companies, with clear memoranda of understanding regarding confidentiality. Some researchers opted to transcribe very sensitive interviews themselves.

4.4 Data Analysis

The researchers were prepared for the data analysis process by being briefed on the analytical framework and software (Google Sheets) that would be used to code and analyse the data. In our initial project plan, we had a planned face-to-face workshop for this analysis phase. While the use of Nvivo or Atlas or similar software would have led to a smoother process, as many members of the research team were on short-term contracts at UCT, they could not access proprietary, collaborative software licenced to the university for data analysis. As an alternative, the COOL project provided a Google Sheets template on which they could input and categorise the data. After coding, the researchers presented their spreadsheets to the team who provided feedback and input. Individualised feedback was also provided by mentors to their mentees.

4.5 Representation: Sharing a Writing Process

The writing process in the COOL project, a key opportunity for capacity building, was envisaged as a strongly collaborative, mutually supportive and fundamentally open process. In both the proposal and the writing stages, researchers were encouraged to place their drafts in the Google Drive Folder that had been created for their case studies. By maintaining a single document, Google Docs reduces discrepancies in document versioning. At the same time, anyone with access to the document has access to the work in progress. Mentors could see the work, as it developed, and the researchers could see suggestions left by their mentors in real time. In feedback sessions, researchers and mentors could work synchronously to make changes on the document. All researchers in the project also had access to each other's Google Drive Folder. This meant that individual researchers were

also able to consult fellow researchers' work, and, in this way, provide feedback and receive inspiration from each other's writing.

Despite envisaging a collaborative, supportive and open process, many researchers preferred writing more privately and shared texts in more 'complete' forms. While some researchers worked on their drafts using Google Docs, as suggested, others opted to write in Microsoft Word, and either upload their documents to Google Drive or send documents to their mentors via email. For some writers, this was a consequence of internet connectivity issues as accessing Google drive documents with unstable internet proved challenging. But others, even relatively experienced and confident writers, expressed discomfort at the possibility of being 'watched' while they wrote, suggesting that our goals of open and collaborative writing processes required more community building efforts to undo existing practices and patterns of behaviour.

With the aim of creating an open-source bibliography that could possibly serve as a resource for others doing similar work, a bibliography system that served as a bank of reading resources was created using Google Sheets during the literature review phase. For easy access to the reading, other than the reference details, hyperlinks to the resources were also made available where possible. During the write up phase, researchers had the resources handy and could easily generate their reference lists.

4.6 Dissemination

In the dissemination phase, we turned to practices such as open publication and participated in a live, online colloquium hosted by DHET, where all the researchers presented their findings and insights emanating from the research. With respect to sharing the 16 case studies produced from this research, each case study makes up a chapter of the COOL edited volume. In addition to these theory-oriented book chapters, an accessible abridged booklet (one for each of the 16 case studies) directed at practitioners, including lecturers, people to be introduced to open learning, institutional planners, managers and administrators, was published as part of the Open Learning Knowledge Series. Both products were published through an open access publisher, under the CC-BY Creative Commons licence. The book is downloadable as a complete digital book and as individual chapters from a publicly accessible site, and the book and the booklets are also hosted on the DHET's in-house National Open Learning System (NOLS).

5. Closing Thoughts

The COOL project, a multi-researcher, multi-site, commissioned research project, provided an opportunity to explore practices contributing to the capacity building of young and emerging researchers. In addition to conducting and disseminating research on the uptake of open learning in the South African PSET sector, the project sought to conduct research in socially just ways. As a result of the COVID 19 pandemic, we had to restructure our research process and transfer, translate and transform events and activities for an online space. We drew heavily on technological solutions such as the Google Drive suite, video conferencing tools such as Zoom, instant messaging, voice and video calling tools such as Whatsapp, and e-research tools such as curation sites and transcription services.

In addition to these technological solutions, we developed a range of contextually embedded practices that strongly influenced the success and completion of the project. Firstly, as a result of an initial plan that was already geographically-distributed, relatively low-tech, and relationally driven in response to our commitment to a socially just approach to research and research team design, transitioning to an online space, while challenging was not impossible. Secondly, we had a number of commitments and processes to maximise opportunities for participation and access in place. Thirdly, despite the inclusivity of the initial design, the change in landscape created by the COVID 19 pandemic required that we pay particular attention to the ways in which our researchers, as individuals, needed support or opportunities to participate or contribute to activities.

Through the experiences in the COOL project, it became clear to us that conducting research at a distance, in online spaces, required more than simply teaching people to use digital tools. It involved navigating existing practices and developing new ones, which took into consideration the diverse contexts in which our researchers worked and lived, in order to best support the successful completion of the project. While this paper has focused on the practices developed in the project, we would like to note that there remains a great deal to be explored around the experiences of mentoring in online spaces, focusing particularly on dimensions of difference and how these can be equitably addressed.

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