


Resilient Research in the Field: Insights and Lessons From Adapting Qualitative Research Projects During the COVID-19 Pandemic

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Abstract

The onset of the COVID-19 pandemic has seen the implementation of unprecedented social distancing measures, restricting social interaction and with it the possibility for conducting face-to-face qualitative research. This paper provides lessons from a series of qualitative research projects that were adapted during the COVID-19 pandemic to ensure their continuation and completion. By reflecting on our experiences and discussing the opportunities and challenges presented by crises to the use of a number of qualitative research methods, we provide a series of insights and lessons for proactively building resilience into the qualitative research process. We show that reflexivity, responsiveness, adaptability, and flexibility ensured continuity in the research projects and highlighted distinct advantages to using digital methods, providing lessons beyond the COVID-19 context. The paper concludes with reflections on research resilience and adaptation during crises.

Keywords

observational research, case study, methods in qualitative inquiry, qualitative evaluation, focus groups

Introduction

The COVID-19 pandemic has brought in a new reality, prompting a series of significant changes in our day-to-day lives. As the world faces uncertainty amidst the pandemic, academia too has had to adapt to lockdown and mandatory social distancing measures (Teti et al., 2020). Research projects around the world faced unforeseen challenges, with some forced to halt completely. Others could continue, but had to be adapted significantly to the new reality. This required what we term “research resilience” to respond to researching in a crisis. Qualitative research involving data collection through face-to-face interactions has been significantly affected. The need to adhere to the new rules required many of us to work from home and transition to digital work environments, and therefore to digital research methods to ensure the continuation of our research. However, while digitalizing qualitative research methods provided, in most cases, the only feasible resort for continuing the research given the limitations imposed by the pandemic, we need to understand the impact on the qualitative research process and the implications for qualitative researchers.

While significant research has been conducted *on* crises (e.g., Buchanan & Denyer, 2013; Doern et al., 2019); few papers address the issue of conducting research *in* a crisis. Moreover, crisis research provides guidance on conducting research on a crisis often retrospectively (Buchanan & Denyer, 2013), yet few studies focus on the ability of researchers to respond to drastic changes in the context of study which threaten the continuity of research projects. We address this gap through a focus on the impact of the COVID-19 crisis on existing and responsive qualitative research projects. Using critical reflection, we draw on our experience of adapting four qualitative research projects to the realities of the pandemic. We demonstrate how, in response to changes in the field, we were able to maintain

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consistency with the research design and achieve continuity in our research projects during the COVID-19 pandemic. In doing so, we build on previous research (Palys & Atchinson, 2012) and provide key insights into the benefits and challenges of digitalizing qualitative research methods, namely, interviews, observation and participatory methods, as well as lessons on building resilience into the qualitative research process to adapt to crises in the field, exemplified by the COVID-19 pandemic.

Importantly, we acknowledge that the COVID-19 pandemic and subsequent social distancing measures have placed significant stress on individuals' lives, including those of researchers and participants. Our paper does not advocate continuing research during the pandemic or other crises merely for its own sake. Every researcher has to weigh the pros and cons of continuing research in crises, taking note of their physical and mental health as well as that of participants. They too must consider the work-related expectations of their positions as researchers, for example, PhD students or full-time researchers where continuing research is necessitated in their roles and/or expected by their research funders. The aim of the paper is to provide guidelines, reflections, and insights to those who *have* weighed their options and have chosen to continue doing research during a crisis as well as to those looking to build resilience in their research projects and plan for unexpected disruptions. We argue that, where feasible, there is value in continuing research for its positive outcomes to society, and hence advocate for proactively building resilience into qualitative research. For example, many academic research projects have pivoted or emerged during the COVID-19 crisis to address some of the problems of the pandemic.

Drawing on our experience, we highlight the importance of proactively building resilience into the research process itself and provide lessons and considerations on adaptability and flexibility during field research. While our adaption was ad hoc and in response to an unprecedented crisis, our experience holds valuable lessons for improving future qualitative research processes. We argue that, going forward, researchers should explicitly build more reflection and flexibility into their research planning, and suggest that they should consider alternative data collection methods and incorporate these into research plans prior to starting the research. In the case of grant-funded projects, for example, such considerations can be incorporated into research contingency plans.

Our contribution to the literature on qualitative research methods is twofold. Firstly, we contribute to the field of knowledge on flexibility, adaptation, and responsiveness of research methods to the research context (Chenail et al., 2011; Holloway & Todres, 2003; Maxwell, 2009), in particular the impact of crises on qualitative research methods. Here, we add to an emerging literature that discusses the impact of COVID-19 on research projects (e.g., Lourenco & Tasimi, 2020; Marhefka et al., 2020; Sevelius et al., 2020) through a focus on pragmatic considerations for researchers adapting

their methods in the field and for those looking to employ digitally enabled social science research methods. We identify the benefits and challenges of conducting remote, online qualitative research as well as how we adapted our approach to mitigate the latter, showing that not every qualitative research method lends itself to optimal virtual delivery. Moreover, we highlight the importance of contingency plans in building resilience into research projects and enabling researchers to adapt as events unfold, thus ensuring the continuity of research in the event of potential changes in the research environment such as crises of various nature. Second, in critically reflecting on our experiences, we highlight the value of critical reflection in itself, which enabled us to provide important lessons for the development of qualitative research practice. Our experience suggests that integrating resilience into research design, and encouraging reflection on research practices, can improve the qualitative research process, and therefore encourage qualitative researchers to adopt critical reflection in their research practices.

The remainder of the paper is organized as follows: in the second section, we discuss resilience in research methods followed by the implications of crises on data collection; in the third section, we discuss the method of critical reflection, which we applied in order to arrive at our insights and contributions; the fourth section discusses our research experiences through a series of stories which highlight the benefits and challenges of digitalizing qualitative research methods as a means of adapting our research practice during the COVID-19 crisis; finally, we discuss our critical reflections and lessons learned from our experiences in fifth section, before concluding.

Resilience in Research Methods

Outlining a plan to address and answer research questions, the research design is a vital step in the research process (Maxwell, 2009; Robson & McCartan, 2016). For empirical studies, this involves planning ways in which data will be collected, in keeping with the ontological, epistemological, and methodological assumptions. Qualitative research relies on gathering data from human participants in open systems—environments that are outside of the researchers' control and where context often interplays with the field of research (Robson & McCartan, 2016). Open systems are harder to control than laboratory environments where research protocols can be accurately predetermined and "fixed" (Kampenes et al., 2008; Merriam & Tisdell, 2016; Robson & McCartan, 2016). As such, constant change within the open system of study is expected to some degree, but is hard to predict (Robson & McCartan, 2016). This often means that qualitative social science researchers must be able and ready to react to changes in the field and adapt their research design at any time (Edmondson & McManus, 2007).

However, although planning the research design is key to ensuring the robustness of a study, predicting and planning for unexpected crises is challenging, requiring what we frame as research

resilience. To situate the concept of research resilience in discussing the empirical accounts of our research projects, the next sub-section discusses the context of conducting research in crises, specifically reflecting on the current COVID-19 pandemic.

From Research on Crises to Researching in Crises

Crisis research has been growing since the 1980s (Buchanan & Denyer, 2013; Doern et al., 2019), with extant studies focusing largely on the impact of exogenous crises such as natural disasters and economic crises on businesses (Chang & Falit-Baiamonte, 2002; Cowling et al., 2015; Dahles & Susilowati, 2015; Grube & Storr, 2018; Torres et al., 2019). The focus ranges from crisis management (Herbane, 2013; Marshall et al., 2015), the influence of pre-existing conditions, such as age, ethnicity, gender, and social capital on resilience in the aftermath of the crisis (e.g., Marshall et al., 2015; Torres et al., 2019), and response and adaptation to crises (e.g., Dahles & Susilowati, 2015; Hong et al., 2012).

However, methodological developments in this arena have focused on how to conduct research in crises. They seek to clarify concepts in the field and to develop novel methodologies for better researching the impact of crises, whether on businesses (Buchanan & Denyer, 2013), communities (Lund, 2012) or humanitarian responses (Salvadó et al., 2015), as opposed to how the research process may be disrupted by a crisis. The focus of crisis research has also largely been on the ex-post impact of the crisis, with research planned as a response to crises to investigate their aftermath. Furthermore, while the nature of the crises under study is varied, including natural disasters, physical, personnel, external criminal, information, economic, and reputational crises (Herbane, 2019), the nature of the COVID-19 crisis is unparalleled in modern times.

The COVID-19 pandemic is, by definition, a crisis, being a “novel, unpredictable, and [...] chaotic event[] that require[s] deliberate and immediate responses” (Lin et al., 2016, pp. 1–2). While the world has previously been confronted with pandemics, the mandatory lockdown and social distancing measures implemented on a global scale to mitigate the spread of COVID-19 are unprecedented. The COVID-19 crisis has affected multiple facets of daily life, with the full impact still unknown. Importantly, crises of this nature and magnitude pose uncertain outcomes to the routine activities in traditional methods of data collection (Spence et al., 2016). In academia, one way the research process itself was disrupted was by the impossibility of conducting face-to-face research, at least temporarily under lockdown measures. However, we know little about the impact of a crisis on research that had been planned before a crisis and that had to continue throughout it.

Recent studies on the impact of COVID-19 on research have focused on adapting research methods digitally, specifically in the context of healthcare and vulnerable participants (Lourenco & Tasimi, 2020; Marhefka et al., 2020; Sevelius et al., 2020)

and exploring the best videoconferencing software for use in qualitative research (Lobe et al., 2020). These studies have focused on the specific areas identified by Karlan and Appel (2016) and Maxwell (2009) as challenges related to conducting research in the field: partnering/research relationships, execution of research design/data collection, and participation/sampling. Given the wide-scale social distancing measures, it is expected that the COVID-19 pandemic has affected qualitative research on these issues considerably. The studies concerning the impact of COVID-19 on research with vulnerable participants often touch on the ethical dilemmas of pivoting to digital research and we acknowledge that digital methods “present new contexts for ethical dilemmas and ethical choices” (Paulus et al., 2017, p. 753). For example, Marhefka et al. (2020) highlight the ethical issue of being unable to ensure that the space in which data is gathered is private as participants may not be able to control the space which they are using. This is particularly problematic for group research activities where sensitive data is gathered as participants could have housemates or family members overhear sensitive participant information (Marhefka et al., 2020). There is also an extensive catalogue of studies which explore the topic of digital research ethics, covering issues such as informed consent, confidentiality, data security, privacy, anonymity, data storage and processing, and ethical decision making while using digital methods (see, for example, Palys & Atchinson, 2012; Tiidenberg, 2018).

Our paper adds to this fledgling literature through a focus on researchers’ resilience in conducting qualitative research during a crisis. We argue that, given the impact of the COVID-19 crisis, it is critical that not only organizations but also individuals, specifically researchers in this context, are resilient to it. Some definitions of resilience focus on the “ability to maintain “reliable” functioning throughout the disruption” (Doern et al., 2019), while others emphasize the ability “to not only survive but to thrive, both in good times and in the face of adversity” (Vargo & Seville, 2011, p. 5621). In this paper, we define research resilience as the ability to adapt and continue the research throughout a crisis while maintaining consistency with the overall research design to successfully complete a research project.

We build on emerging work through a focus on research projects that involve face-to-face qualitative research and multiple researchers. We provide empirical reflections on our experiences of adapting research projects during the COVID-19 crisis, from March 2020 onwards, when social distancing measures were legislatively imposed. The next section describes our methodology to presenting empirical accounts of research resilience.

Methodology: Critical Reflection

The findings and discussion presented in this paper stem from our use of a critical reflection framework applied to our research practice. Critical reflection is rarely defined, as there is an underlying assumption of shared meaning. However,

Boud et al. (1985, p. 19) define critical reflection as an activity that individuals engage in to “explore their experiences in order to lead to new understandings and appreciation.” Moreover, Mezirow (2000) views critical reflections as an unearthing of deeper assumptions that put forward what had previously been unquestioned cultural norms and practices (Fook & Gardner, 2007). Fook and Askeland (2006) posit that the unearthing of assumptions in critical reflection should have a goal of bringing improvements in professional practices—in our case in research practices.

This way of conducting research has proved useful in qualitative research designs, for example, in phenomenology, ethnography, and feminist studies (Mortari, 2015; Sampson et al., 2008). Researchers using these methodologies are encouraged to continuously and critically reflect on their roles as researchers, specifically on how they are situated in the field and on the relationships and influences they have on participants (Mortari, 2015). More importantly, in these types of studies, learning by experience is an important component of successful analyses. Being critically reflective also allows for adaptability in research practice, which is particularly useful in research fields that are constantly impacted by change, such as crisis research (Spence et al., 2016).

We draw on the framework of critical reflection in research practice by White et al. (2006), who suggest that one should view critical reflection as involving four stages of development: (1) a process of examining assumptions embedded in experiences; (2) linking these assumptions to different sources (whether personal, emotional, social, cultural, historical and/or political); (3) re-evaluating these to relevant objectives for reflecting and lastly, (4) to rework practices and concepts based on this re-evaluation (p. 12). Fook also refers to the process of critical reflection as beginning with the telling of stories, which is the “description of a piece of [. . .] practice experience” to be reflected on (Béres et al., 2011, p. 83).

The critical reflection framework presented by White et al. (2006) assumes that a degree of change is expected in order to learn about and/or improve practice. We employ this framework of critical reflection in this study at a project- and team-level, drawing on our collective experiences of conducting qualitative research during the COVID-19 pandemic, with the aim of generating lessons from our reflections. To carry out the methodology, we firstly identified areas in our research process that we wanted to reflect on. Secondly, using peer discussion, we re-evaluated our research practices and drew out insights and changes to be made in order to adapt our research projects to the new realities imposed by the pandemic.

The four authors of this paper were involved in one or more of the research projects outlined in Appendix A. Responding as a research group to the abrupt changes generated by the COVID-19 pandemic, we made strategic choices that allowed us to pivot the process of data collection to ensure the continuity of our research projects. Appendix A provides an overview of each research project,

outlining their status, the planned methods, and the actual methods applied, alongside the implications of these changes. Three of these (Standards, Regulation and Trust [SRT], Law and Accounting Services [LAS], and Community Business [CB]), have been re-conceived as completely online or digital projects. The group has also been involved in a reactionary project (The impact of COVID-19 on small and medium enterprises (SMEs) [CV19])—a “fully digital” project from the start.

We first identified stories of practices that we want to reflect on. We focused predominantly on the methods that we have employed in our different projects; on how we have adapted these methods in response to the mandatory social distancing measures, the benefits and challenges of each method, and how we countered those challenges. From here, we reflect critically with the aim of answering the question of “how have our practices to adapt our research in the pandemic taught us to ways to become more resilient in our research conduct?” Through our reflections, we develop insights based on practices that we have incorporated in our own research procedures. We begin with the stories of adapting our research methods in COVID-19 in the next section.

Insights From the Ad Hoc Adaptation of Qualitative Research Projects During the COVID-19 Pandemic

This section is the first stage of our critical reflection, focusing on the stories of conducting qualitative research in a pandemic that we wish to learn from. First, we highlight a number of aspects that we considered in making the decision to continue the research projects as opposed to pausing them. We then discuss our experience of adapting our qualitative research projects in relation to the different qualitative research methods employed, the challenges that we encountered in digitalizing qualitative research methods, and how we responded.

Considerations on Continuing Versus Pausing the Research

First, in the case of LAS, there were funder and institutional expectations that the research will continue as well as the need to achieve our key performance indicators. Pausing the project was not feasible given the timeline and funder expectations. We were, however, offered the opportunity to apply for a no-cost extension, which we took, to allow us to make any necessary adaptations and to account for any delays that may arise due to participants being busier than usual. Before deciding to continue the research project and apply for the extension, we considered the feasibility of conducting virtual interviews and workshops and the impact on the quality of data and original research questions, and collectively agreed that, while challenging, digital adaptation is possible and that the latter would not be materially impacted.

In the case of SRT, the process of the data collection was expedited due to participants' responses. As participants became accustomed to working-from-home arrangements, they had agreed to speak to the researcher faster than expected. The observation stage of the data collection was also expedited due to workshops, seminars, and conferences going online. The researcher took this opportunity to carry on with the data collection process, as responses from participants had been positive.

The CV19 project, on the other hand, was specifically born out of the new pandemic context and the opportunity to engage with the small business community to identify the main challenges brought by the pandemic. Our motivation was to provide rapid critical insights to policymakers to support evidence-based policymaking. Importantly, we carefully considered the ethical implications of this research project, including aspects such as the wellbeing of the participants, and took appropriate measures to minimize the potential harm to participants, such as avoiding sensitive questions and highlighting sources of support provided by business support intermediaries. Moreover, for all four research projects, we acknowledged that the pandemic may have caused additional stressors in participants' lives and therefore took extra care in engaging with potential and actual participants. For example, we did not insist on doing follow-up requests on an interview invitation if we received no response and were flexible in our approach, for example, reducing the interview time if participants requested it.

Nevertheless, as we discuss in the sections below, there were method-specific challenges that we did not anticipate. In the subsections below, we reflect on our experience of adapting our research projects and pivoting to online qualitative research methods in response to disruption in research projects in relation to three core components. Firstly, being able to adapt our methods; secondly, being open to and using opportunities presented by the crisis; and thirdly, being able to use digital technologies. Adapting the research methods through digitalization presented a series of benefits, opportunities, and challenges. We discuss each of the core research methods employed across research projects to outline ways in which flexibility and adaptability to the research field have affected the use of the method. Appendix B outlines, in table form, the benefits and challenges of digitalizing qualitative research methods employed as part of each project and the ways in which we have mitigated these challenges.

Interviews

Interviews were a core data collection method in all of our research projects. With face-to-face interviewing no longer feasible, we pivoted and took the opportunity to conduct virtual interviews. Part of the process of digitalizing this process includes a reflection on how virtual interviews affected the quality and continuity of our research and how the shift to digital affected our interviewees.

We encountered a number of challenges associated with conducting virtual interviews. First, we noticed that interviewees were easily distracted (Gilham, 2005). Distractions from home life such as childcare, caring responsibilities, and pets, compounded by work interruptions such as emails, are more common when working from home and can affect the quality of the interview by interrupting the flow. The literature suggests that interviewees can also be distracted or disturbed by seeing themselves on-screen (Deakin & Wakefield, 2014; Mirick & Wladkowski, 2019; Seitz, 2016). This may explain why, where we conducted video interviews, some of our participants chose to switch their video function off for the duration of the interview. However, this made it more difficult for us to engage with them through physical actions such as maintaining eye contact and affected our ability to build rapport. Not being able to see interviewees meant that we could never be sure if the interviewees were engaged in the interview. For example, some interviewees on the CV19 project were multitasking during the interview, responding to interview questions while carrying on with their work. On the one hand, this exemplifies the pressure of the COVID-19 pandemic on interviewees—here, SME owner-managers—to sustain their businesses, while on the other hand highlighting the challenge for researchers to keep interviewees engaged, maintain the flow, and elicit in-depth answers. This could also relate to features of technostress, where people feel they must be available for work at almost all times and cope with multitasking, brought on by the conditions of working from home (De et al., 2020).

Secondly, interviewees were more likely to be late or not show up to scheduled interviews (Deakin & Wakefield, 2014). We noticed that some interviewees perceived video interviews as easier to reschedule (particularly last minute), and therefore conducting the interviews online may have affected participants' commitment to attend on time or show up at all. However, this could have also been caused by the need to respond to other pressing demands and unpredictable events caused by the pandemic. This is likely to have been a particularly acute issue in the context of the pandemic, especially considering that lockdown and social distancing measures have brought a stark change to the lived experiences of interviewees. For example, working-from-home arrangements, the need to tend to the home schooling of children in parents' case, caring for ill relatives, as well as the stressful situation of some individuals living alone, may have created challenging circumstances for interviewees, thus affecting their commitment or ability to participate in the interviews.

Another issue that affected the online interviews in some instances was poor Internet connection, which diminished the quality of the data collected (Archibald et al., 2019; Deakin & Wakefield, 2014; Mirick & Wladkowski, 2019; Opendakker, 2006; Seitz, 2016). As a result, we often had to ask interviewees to repeat their answers or missed parts of their answers altogether. This represents a risk to the quality and robustness of the research and poses a challenge to the

data collection process (Maxwell, 2009) and the execution of research design (Karlan & Appel, 2016). However, this was not a prevalent issue as our studies were conducted in the UK and both the researchers and the interviewees generally had access to good Internet connection. In the few instances, connectivity issues may have been caused by the growth in demand for Internet connectivity, as many people started to work from home. Nevertheless, we acknowledge that there are contexts in which both the researchers and the participants may face acute challenges associated with poor Internet connectivity, which may require researchers to consider alternative data collection approaches such as phone interviews and text interviews.

Importantly, the quality of some interviews was affected by the inability to build rapport with interviewees prior to the interviews, highlighting a challenge to building research relationships (Maxwell, 2009). Researchers were unable to use traditional means of building relationships between researcher and participant, such as shaking hands or sharing food or drinks (Deakin & Wakefield, 2014). This issue was particularly evident in our experience of interviewing experts in the SRT and LAS projects. Experts are considered hard-to-access populations due to the premium they place on time and loss of productivity (Stephens, 2007). This issue was particularly challenging as experts faced greater demands for their time during this crisis, coupled with working from home, which may cause information and emotional overload. To overcome this challenge, we recruited interviewees through “gatekeepers” who facilitated an introduction or even secured the interview (Marland & Esselement, 2019; Sevelius et al., 2020). We also had introductory conversations with all interviewees prior to the interview, which was often facilitated by gatekeepers. This enabled interviewees to get accustomed to the researcher and to better understand the project. These introductory conversations helped clarify expectations between the researchers and the participants as well as easing worries that they might have had about participation. Therefore, our experience highlights introductory conversations as a means to facilitate good research relationships during times of crises (Maxwell, 2009).

Conversely, our experience with the CB project was somewhat different in that this was developed with insights from the other projects, and recruitment of interviewees was planned through gatekeepers, utilizing existing relationships. Here, the researcher was aware of the issues of technostress and multitasking during virtual interviews, and also considered the risks of missing data due to weak internet connections. However, the advantages of being able to collect data outweighed this risk particularly because the researchers were eager to capture some of the impact of the pandemic on this unique business type. The interview transcripts from the project’s previous rounds, which were conducted over the phone, suggested that having video interviews would be advantageous in this case. For example, one interviewee stated:

If we were on Skype, I would show you one of my favourite charts, which is that of the past twelve years, we have had a broadly straight-line growth, in terms of revenue and some costs. (CB Interviewee, 2017)

Thus, the ability of participants to use visual props added an extra level of depth to the conversation that could not be achieved during the phone interviews. As such, rather than following the previous project plan of using phone interviews, the researcher learned from the CV19, LAS and SRT projects and decided to use videoconferencing software to conduct the research, thereby unlocking additional data collection benefits.

Despite the challenges discussed above, there was value in continuing the research projects, both for the participants and the research team. For example, in the case of CV19 and SRT, participants expressed their interest to participate and provide insights and were willing to get involved to help, acknowledging the importance of research under such circumstances and the valuable insights that this can yield.

Observation

Observation relies on immersion in the field and on building rapport with participants (Kawulich, 2005). Virtual observation should be distinguished from digital ethnography in which a researcher immerses themselves in the daily lives of populations existing in the virtual world (for example among users of a forum or a social media website) (Dewalt & Dewalt, 2010). In the SRT project, we employed observation of virtual events, which would have normally happened face-to-face, and identified several benefits and challenges to adapting our research in this way.

Similar to virtual interviews, a considerable amount of time and money was saved by using virtual observation. Originally, the researchers were planning to travel across the UK to physically attend various events, which would have incurred costs from registration, travel, accommodation, and subsistence. However, with many of the events held virtually and for free, this greatly reduced the overall costs of our projects, which was perceived favorably in light of the uncertainty created by the pandemic. Therefore, this proved to be an advantage for overcoming the challenge of executing the research design during a time of crisis (Karlan & Appel, 2016).

Moreover, unlike video interviews, virtual observation was novel territory for the researchers. Observing interactions between participants was a key challenge in shifting from face-to-face to virtual observation, as the former is a key component of participative observation methods (Kawulich, 2005). One of the first events that the SRT researchers virtually observed was a three-part networking event set up by a government body that aimed to attract collaborators from public and private sectors. Each event lasted for 7 hours and was held on a webcast system. The first of these events highlighted the difficulty of observing interactions between

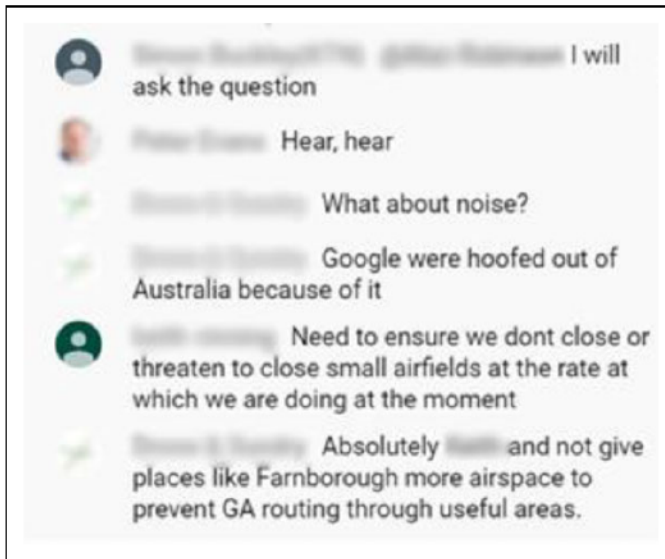


Figure 1. Excerpt from example chat box screen capture. Source: Researcher's data collection.¹

participants; because of the large number of attendees at the event, participants could only interact through the webcast's live chat box. The organizers did not allow participant videos, fearing that this might cause connection issues, and the event did not have separate chat rooms in which participants could go to network in private. Moreover, all participants could see all entries in the chat box, which created a feeling of public exposure. Thus, the first event had minimal interaction from participants. Critically, this limited the opportunity for observation for the researchers and their ability to participate as an observer as well.

However, by the second and third events, the chat box proved to be a great advantage for observation. By the final event, participants greeted everyone, introduced themselves, and spoke about their interests as soon as the event started, without being prompted by the organizers. This shows that persistence at digital events is key to virtual observation. Participants engaged in lively discussions, sometimes even talking to each other through the same chat box (Figure 1). Importantly, the shared chat box made it easier for the researcher to record interactions by screen capture or "copy and paste." This, in turn, enabled easier reflection on the conversations and inclusion in the observation diary. The researchers in this project foregrounded the topic of study rather than being tied to traditional face-to-face observation (Holloway & Todres, 2003), allowing for the method of capturing data to develop as the field changed, showing resilience.

A further challenge associated with virtual observation was the lack of networking opportunities. At face-to-face events, the researcher can speak to all participants while networking with them and potentially recruiting them for formal interviews (Kawulich, 2005). However, the lack of face-to-face interaction meant that this opportunity was lost,

thus posing a challenge to the interview recruitment and data collection process (Maxwell, 2009). Nevertheless, as event organizers began to become more accustomed to running virtual events, networking opportunities were created. In one event, the researchers observed event organizers' hosted networking time prior and post-event. This included matching event participants through request forms, which allowed participants to choose the types of participants (based on the industry they are from, their roles, and/or their reason for participating in the events) they wanted to be connected with. Networking opportunities ranged from allowing participants to message other participants privately through the events' own web messaging services and/or organizing participants in virtual breakout rooms based on their interests. When event organizers did not offer such networking opportunities, the researchers took the initiative to contact the event organizers and asked for their permission to advertise the project to participants through the online event. This enabled the recruitment of participants who otherwise may not have been included.

Upon the completion of online observation, the researcher noted that the overall quality of data collected via online methods is comparable to that of face-to-face observation method. We noted, however, that the *types* of data collected have been slightly different, as there are limitations to data collected via online observation. For example, the researcher was unable to observe data that can only be gathered in a face-to-face context, such as the body language of participants when communicating with each other. However, the data collected online also had unique particularities. For example, participants of face-to-face seminars are less likely to engage in active discussion on the seminar topics compared to participants of online seminars who are able to do so via the chat feature throughout the entire seminar, without worrying that they are interrupting the speakers.

Workshops/Action Research

Perhaps the most challenging adaptation was shifting from in-person to online workshops. Here, our insights draw on our experience of adapting and digitalizing two research projects involving action research, namely LAS and CB. The LAS project was significantly delayed and disrupted by the onset of the COVID-19 pandemic. The project was progressing through its penultimate stage involving engagement with companies via workshops when lockdown abruptly put a stop to this phase. The company workshops are both a dissemination and research method as they involve working with companies to support the adoption of artificial intelligence technologies while researching the process in real-time. Prior to the lockdown measures being imposed, the workshops took place in person, as they required extensive group work and in-person collaboration. They were organized to take place either at companies' premises or in public locations that were accessible to participants. Therefore, the implementation of lockdown and social distancing measures essentially brought the project to a halt, with

some companies withdrawing from the workshops even before these measures were officially announced. The project was further stalled by uncertainty and required numerous talks with the funding body to assess the impact of the pandemic, plan alternative options, and develop mitigating strategies. It was not until the project extension was approved by the funder that we could start rethinking and redesigning our delivery methods to re-engage with businesses and continue our research.

Pivoting from offline to online delivery, in this case, was not as straightforward as with face-to-face interviews. Online workshop delivery required more than identifying appropriate videoconferencing software, namely a substantial rethinking of workshop activities and delivery methods and an overhaul of the workshop format. As Appendix B shows, there are numerous challenges to delivering online workshops, more than with any of the other research methods discussed in this paper. For example, the absence of face-to-face interaction between participants meant that some activities involving this element were simply not possible in an online environment. Therefore, redesigning the workshops required painstaking preparation, numerous team meetings among the members of the research team, and multiple mitigation strategies, including significantly reducing the lengths of the workshops to avoid technostress, creating new digital materials, and rethinking the facilitation of activities.

Importantly, the challenges presented by delivering online workshops highlight that not every qualitative research method lends itself to optimal virtual delivery. Indeed, and despite the numerous challenges, ensuring the continuity of the project under social distancing measures is valuable, yet the results for the research process are less than optimal. As highlighted in Appendix B, some of the key challenges relate to participant access and engagement as well as the quality of outcomes, all of which are negatively impacted by delivery in an online environment. Therefore, our experience brings initial evidence that contrasts with Archibald et al.'s (2019, p. 5) findings showing a positive experience of using Zoom as a videoconferencing tool and with their conclusion that "using Zoom for data collection significantly outweighed the challenges encountered." In our experience, when using videoconferencing for more participatory research methods, the challenges are more numerous and require significant effort to mitigate. As such, while videoconferencing tools such as Zoom may indeed be more advanced than other tools, replicating the features of face-to-face interviews in the case of one-to-one interviews, they present multiple challenges for researchers when the number of participants increases and the nature of the research requires group work and participant interaction. This was a significant challenge to the coherence and consistency of the research project, which had relied on this method (Holloway & Todres, 2003). However, as flexibility had been built into the LAS project, the researchers gathered high-quality data through other virtual qualitative methods, such as follow-up online interviews and post-

event participant feedback, which supplemented the more limited data gathered from the online workshops. The difficulty of running workshops online is reminiscent of challenges faced by many academics who have to conduct online teaching throughout the pandemic. The dramatic transformation of moving from face-to-face to online methods impacts, as we see here, not only teaching practices, but also many kinds of work practices in the pandemic, research included.

Despite these challenges, there was also value in continuing the LAS research project and benefits to participants. While busier than usual, most of the participants accelerated their consideration of adopting new technologies and therefore benefitted from the free participation in the workshops to support their strategic thinking. Their participation not only enabled us to continue the research project, but the positive feedback motivated us to continue to reach out to others.

Finally, despite the challenges of conducting workshops and action research digitally, the CB follow-up project maintained a workshop and action research element. The plan of this part of the data collection was placed towards the end of a yearlong data collection period with the hope that face-to-face interactions could take place. However, the researchers felt reassured that, although digital workshops may not be the ideal data collection, they provide an alternative to canceling workshops.

Critical Reflections and Lessons for Building Research Resilience

Building on the above reflections on our practice, we conducted peer discussions to further critically reflect on the practices that changed during the research process. In doing so, we drew out lessons for how we would change our research practices to proactively increase and embed research resilience in our research projects moving forward. We provided our discussion of research resilience by first acknowledging that increasing pressures of balancing demanding workloads (stemming from prior to the pandemic and only rising since) with home life and other responsibilities has an impact on physical and mental health. Thus, when we discuss research resilience, we are not advocating for a "powering through" approach. Indeed, it is hoped that by encouraging critical reflection, researchers will become more aware of when to adapt and change and when to take a break, pause, and evaluate.

At the beginning of our journey of adapting our research projects ad hoc, in response to the COVID-19 crisis, we too felt the pressure to quickly find ways to continue our research projects. This pressure came from prior experiences with research funders and needing to ensure that projects are completed on time and from our own expectations of ourselves as researchers. We found that at the beginning of this process, we were constantly in communication with each other, more than we had been prior to the pandemic, via online methods. This

resulted in feelings of technostress (De et al., 2020) due to the additional social interactions and the over expectations that we had before easing into the social norms of working from home. Therefore, our first and important lesson is that, in gaining research resilience, we do not encourage academics to simply “carry on” with their research whilst ignoring important aspects of physical and mental health in their lives. As mentioned in the introduction, an important question to consider is whether one should continue the research at all. It is of the utmost importance that every researcher weighs the pros and cons of continuing their research in crises. In relation to the pandemic specifically, researchers need to consider not only their own physical and mental health, but also that of the participants.

Indeed, not every project must, need to, or can go ahead. Researchers also have the option to pause a project until circumstances improve, especially where the crisis affects their own mental health or that of participants, the ability of participants to participate in and focus on the study, and the quality of data collected. The level of uncertainty during the pandemic was rather high, and thus it would have been difficult to anticipate its end (we are still facing the pandemic at the time of writing), but other types of crises may present lower levels of uncertainty, meaning that researchers may be better off pausing their research projects temporarily. While previous research points to the potentially negative impact of digital technology on data quality more generally (Palys & Atchison, 2012), in our specific cases, we did not notice a significant decrease in the quality of the data collected. The digital context imposed some limitations, as highlighted in Appendix B, and while in a small number of cases these were particularly acute, the overall quality of data collected during the pandemic was comparable to that collected pre-pandemic. Nevertheless, researchers need to consider the challenges and the potential negative implications of continuing their research in a crisis on a case-by-case basis. If they decide to continue their research, pilot work can help test the suitability of different methods and surface potential data quality issues early-on so that the researcher can take further precautions or consider alternative research methods, if and where appropriate and feasible.

Our second lesson relates to the need for qualitative researchers to embed flexibility and adaptability in the research procedure in anticipation of crises, which in our case was the COVID-19 pandemic. While our adaption was ad hoc and in response to an unprecedented crisis, our experience holds valuable learning for improving future qualitative research processes and proactively building resilience in the research process. For example, although the original research questions for the SRT and LAS projects have not changed because of the pandemic, the impact of a crisis on research questions, aims, and objectives has to be considered on a case-by-case basis. These might need to be adapted or change depending on the nature of the crisis and how the new circumstances affect the context of the study, the stage of the project (i.e., whether the stage permits a change), as well as

the possibility to conduct/complete the research using pre-crisis or adapted (digital) methods. It is also important to note that the pandemic opened up new research opportunities to build on the current projects and examine related issues to provide new insights in the context of the pandemic. Therefore, crises might lead to changes to research questions, aims, and objectives that might produce new insights, as well as to new research opportunities.

Moreover, while our experience of adapting our qualitative research and experimenting with digital qualitative research methods was ad hoc, in some cases prompted by funding bodies and in others by the new context of the pandemic per se and the opportunity to provide new and unique insights into the impact of the pandemic, we want to highlight that before conducting research in a new medium, it is important that researchers familiarize themselves with its affordances and limitations. This may involve testing the suitability of the new research medium and methods and familiarizing with all technical aspects involved in conducting the research in the new medium. Therefore, we suggest that, before pivoting to digital research methods or to conducting research in a new medium in general, researchers engage in extensive contemplation, preparation, pilot study and reflection in advance of data collection as well as reflection, flexibility and adaptation during data collection and subsequently during knowledge transfer planning.

At the same time, while our experience took place during the COVID-19 pandemic, which created many specific social challenges, our insights and lessons are relevant beyond the context of pandemics. We realize that crises could come in many forms, affecting the continuity of qualitative research data collection. Crises, when understood as any unexpected interruptions to the continuity and successful completion of a research project, can be large or small. Qualitative researchers may face numerous types of research-related crises—unexpected situations that may halt the research procedure temporarily or altogether. From losing potential observation subjects to collecting low-quality data from important interviews, these types of unexpected situations can happen in various qualitative research projects. Therefore, it need not be a pandemic for a researcher to realize the importance of embedding resilience in their research projects for the sustainability of the research project. Resilience here relates to the ability of one to foresee the different challenges that may affect a research project. This is in line with our definition, which highlights resilience as the ability to adapt and continue the research throughout a crisis while maintaining consistency with the overall research design to successfully complete a research project. In our reflection, we thus see value for qualitative researchers to purposefully and proactively embed detailed and robust contingency planning in their research projects in anticipation of potential changes in the field. Adopting a proactive approach to building research resilience, where appropriate and feasible, can obviate many of the challenges that we encountered. It is our hope that the insights and lessons drawn from our experience will be useful to

qualitative researchers in developing a more resilient approach to their research.

When considering resilience, and the continuation of projects, it is important to note that the onus is not exclusively on the individual (or singular teams) to consider the best course of action. It is particularly important for us to acknowledge that structural and systemic inequalities do affect resilience (Hart et al., 2016), and that Higher Education and research institutions must consider these nuanced contexts and adjust their expectations accordingly, providing support where possible to redress these inequalities. The idea of researcher resilience must be set in the context of the difference in the abilities of staff members at different levels, with different experience and different duties to adapt to crises.

Furthermore, critical reflection is crucial when conducting research as it helps researchers legitimize their course of action and validate the research procedures they have employed (Dahlberg et al., 2008). As Mortari (2015, p. 2) highlights, research practice is “enhanced by education” gained from reflection, subsequently forming a part of the researcher’s training and helping them to gain awareness in their inquiry practice. At first glance, it may appear that we are advocating for the employment of a pragmatic philosophy to research design. However, we would argue that encouraging researchers to be more reflective in their research practices can be beneficial across research designs in qualitative research as it allows responsiveness in data collection and can aid in researchers’ personal development (Dewey, 1933; Mortari, 2015).

In addition to the lessons above, our experiences have also highlighted the potential benefits of doing qualitative research remotely, one of which is inclusiveness of some populations. Not only can researchers from different regions, countries, or even continents better collaborate and coordinate via online video conferencing tools, but researchers can individually reach a much wider and diverse population of potential participants from across the globe without the need to physically travel. Indeed, as highlighted in this paper, there are elements of face-to-face, in-person research that will perhaps never be fully replaceable by online tools and there are still significant numbers of people who are not accessible through digital methods, nor do we suggest that remote, online research should become the norm in qualitative research. Rather, experimentation with online qualitative research methods during the pandemic may have opened the door to new collaborative research opportunities as well as the opportunity for researchers to reach participants in areas otherwise difficult or impossible to reach without travel.

However, pivoting our research online is only feasible if “the other” (participants, interviewees, observed events) can also be enabled by digital methods. This relates to the broader issue of digital inequality, which refers to access and use of Information and Communication Technologies, both in terms of physical devices and software, and the Internet (Lucendo-Monedero et al., 2019; Tomczyk et al.,

2019). While there have been significant advances, ongoing research continues to highlight digital divides and persistent inequalities in digital access and skills within and across both developed and developing countries (e.g., Ragnedda & Kreitem, 2018; Robinson et al., 2015; Tomczyk et al., 2019). Key issues include lacking or non-existent ICT infrastructure and the quality of Internet connection, which affects particularly those in rural areas, less economically advanced regions, geographically isolated populations (Lucendo-Monedero et al., 2019; Robinson et al., 2015). Moreover, Beaunoyer et al. (2020) argue that the COVID-19 crisis will worsen pre-existing digital inequalities, disproportionately affecting low-income households, with issues such as slower connections, affordability of personal technological equipment, and restricted physical access to Internet due to the closure of workplaces and numerous public spaces being particularly acute for many. In light of this, qualitative researchers need to be aware of and consider the implications of such digital inequalities, the associated challenges in accessing specific populations, the risks of some populations being under- or even unrepresented in research studies, and the ethical implications.

Our paper does not encourage the notion that “going online” is the only immediate and effective solution to conducting remote research. Instead, we highlight that responding, adapting, and flexibly pivoting to using digital methods gave us the research resilience needed to continue our projects in the context of a global pandemic. To think creatively in anticipation of opportunities despite facing a crisis is another lesson learned on how to achieve research resilience in practice. The process through which we adopted digital methods helped us understand that to be resilient is to look beyond creative and alternative solutions, but also to understand ways of advancing our projects by locating opportunities for reflection and learning.

Conclusion

The aim of this paper was to provide insights and lessons from adapting qualitative research projects ad hoc, in response to the COVID-19 crisis, by focusing on how researchers can develop research resilience during crises. We highlight that the unique and unprecedented nature of COVID-19 pandemic and associated social distancing measures resulted in a crisis in contemporary research, affecting both the research focus and the ability to undertake research. In this context, the adoption of digital research methods was critical to ensuring continuity in our research projects. It enabled us to continue data collection as well as to collect real-time data during the crisis, thereby allowing us to respond and build resilience in the research process.

By applying a critical reflection framework to our practices (White et al., 2006), we were able to provide empirical insights and lessons into research continuity in the current global pandemic context. In doing so, the paper makes several important contributions to the literature. By discussing how our research

team adapted to the “new research normal” created by the COVID-19 pandemic to ensure the continuity of existing and planned research projects, we identified the benefits and challenges of conducting remote, online qualitative research and how we adapted our approach to mitigate the challenges. Our experience has also shown that not every qualitative research method lends itself to optimal virtual delivery, with virtual observation and online workshops presenting more challenges than virtual interviews. It is our hope that awareness of these benefits, challenges and mitigation strategies will help qualitative researchers to build resilience in their research and learn to adapt their qualitative research project quickly in situations that would normally risk halting the research altogether, such as in crises.

We achieved this by critically reflecting on our own research experiences of adapting qualitative research projects during the COVID-19 pandemic, drawing out key insights on how to proactively build resilience in qualitative research practices. In the lessons we draw from our experiences we first acknowledge the potential impact of crises on researchers’ physical and mental health. We therefore do not promote a “powering through” approach that ignores physical and mental health aspects, but encourage researchers to consider such implications before embarking on further research in crises. We also acknowledge that different situational factors (such as precarity, status, and role) will have an effect on the researcher’s ability to respond to crises. Second, we argue for a proactive approach to research resilience whereby researchers purposefully embed detailed and robust contingency planning in their research projects in anticipation of potential changes in the field. This can not only help alleviate the unexpected and abrupt impact of a crisis but also addresses potential funding requirements where projects are externally-funded and can mitigate pressure from funders. Third, upon our own

critical reflection, we encourage researchers to be more reflective in their research practices, which enables responsiveness in data collection. Lastly, we acknowledge the opportunities and potential benefits of remote qualitative research, such as inclusiveness through the ability to reach participants in areas otherwise inaccessible without traveling in person.

Whether online qualitative research will continue to be merely an alternative to face-to-face, in-person data collection or whether this will become a more permanent feature of qualitative research remains an important question. While the answer depends on the evolution of the pandemic, we believe that experimentation with online qualitative research methods during the pandemic may lead to qualitative researchers and/or participants developing a preference for online methods. We do not argue that the online research adaptation strategies presented in this paper are better or worse than face-to-face, in-person research. They are simply different and designed as a response to evolving and uncertain circumstances to enable researchers to continue their activities through resilience.

Finally, as Paulus et al. (2017, p. 754) emphasized, “Qualitative researchers are actively making sense of digital spaces and the use of digital tools, and we are in great need of venues for debating and exploring our different experiences.” Given that the pandemic is likely to have accelerated experimentation with digital qualitative research methods, we invite qualitative researchers to share their experiences. Future research on qualitative methods can build on our insights and lessons and examine the adaptation of particular methods through digitalization in more depth. At the same time, as much uncertainty remains, further research is required to better understand the impact of the COVID-19 pandemic on the qualitative research process and researchers themselves.

Appendix A

Table A I. Authors' Research Projects in the COVID-19 Pandemic.

Project	Project Description	Status Pre-COVID-19	What Was the Method (Planned)	What Is the Method (Applied/Actual)	Implications for the Project
The impact of COVID-19 on SMEs (CV19)	This project was prompted by the COVID-19 pandemic. Small and medium enterprises (SMEs) are the backbone of the UK's economy, contributing significantly to economic growth, to social stability and to the sustainability of the communities in which they operate. The project examined the impact of the pandemic on SMEs, specifically the immediate impact on short-term survival, their ability to continue to operate during the pandemic, the adequacy of government measures for different types of businesses, and the resilience of SMEs during the crisis.	New study (during Covid-19 pandemic)	N/A—crisis-related research	<ul style="list-style-type: none"> Online Survey Virtual interviews (40 in-depth SME owner-managers) 	The research progressed at pace as main challenges were assessed prior to the start of the project and mitigation strategies were put in place. Challenges that arose during the data collection stage related to access and interview scheduling, with some SME owner-managers either unavailable due to the demands and pressure of the pandemic on their business or cancelling interviews last minute.
Standards, Regulation and Trust (SRT)	The SRT project explores standards, regulation, and trust as institutional logics and their impact on innovation and productivity. To meet the research aims, the researcher planned to conduct non-participant observation at industry- and policy-based events, including workshops, seminars, and conferences. These events would have provided the researcher with the opportunity to network and recruit expert interview participants for the second phase of data collection. Expert interview participants in this project refer to a group of policy and industry experts who are mostly at the managerial and/or decision-making level in their institutions.	Early stages	<ul style="list-style-type: none"> Semi-structured interviews Participative Observation 	<ul style="list-style-type: none"> Virtual observation at 10 online events Virtual interviews with 30 interviewees 	The research progressed at pace as main challenges were assessed as COVID-19 social distancing measures came in place. Mitigation strategies were put in place and a decision was made to pivot to completely digital methods. Challenges were encountered in observation data collection but were mitigated with events going virtual. Challenges in building rapport with expert interviewees were encountered through introductory chats and gatekeepers.
Law & Accountancy Services (LAS)	The challenge of artificial intelligence (AI) is predicated on the existence of a substantial yet bridgeable gap between new and emerging AI technologies and their potential for application. This project focuses on how this gap might be bridged or closed, looking at mid-sized legal and accounting professional services firms (PSFs). The project examines the added value that mid-sized accounting and law firms can gain from leveraging the potential of AI technologies. The project examines the institutional context shaping mid-sized PSFs, and the strategies, business models and innovation practices of early adopters to the impact of technological assimilation on these firms.	Established study	<ul style="list-style-type: none"> Semi-structured interviews Case studies Design sprints 	<ul style="list-style-type: none"> Virtual interviews (10 in-depth interviews conducted online) Virtual workshops (four design sprints delivered virtually) Virtual Action research 	Progress was limited and disrupted. The project was interrupted by the COVID-19 lockdown measures during the industry engagement stage involving workshops with PSFs and policymakers. This delayed the delivery of the project significantly and prompted project partners to develop mitigation strategies and alternatives. As a result, the project was adapted through the development of online workshop delivery methods. It also now includes a focus on examining the impact of the COVID-19 pandemic on AI adoption in the professional services sector.
Community Business	Community businesses are a subset of social enterprises, which operate at and serve a small geographic area. The community business project is a follow-on to a series of research projects on the state of the sector, conducted in partnership with an independent trust. The follow-on study was designed to capture the impact of COVID-19 on community businesses, and whether community businesses felt they had the resources and capabilities to meet emergent community needs. The project used qualitative methods to gather longitudinal data on community business and their responses to the COVID-19 crisis.	Extension study. Follow up is at design phase	<ul style="list-style-type: none"> Telephone interviews Online survey 	<ul style="list-style-type: none"> Virtual interviews (40 interviews with community business leaders) Virtual workshops (three virtual workshops) Virtual action research (observation at events) 	The reflections from the studies listed above have helped guide the design of this research project. Delivery has not started at the time of publishing however, we are planning to adapt the existing methodology to enhance data collection from learning gained from the above projects.

Appendix B

Table B I. Table of Benefits and Challenges to Digitalizing Research Methods.

	Benefits for Projects Employing Digital Methods (in a Crisis)	Challenges for Projects Employing Digital Methods	Ways of Countering Challenges
General to digital research methods	<ol style="list-style-type: none"> 1. No travel 2. Reduced costs 3. Wider participant pool 	<ol style="list-style-type: none"> 1. Distraction - easier for participants to get distracted with emails and work-related tasks as all work is on-screen 2. Technology interruptions 3. Requires good quality Internet connection 4. Difficulties in building rapport 5. Requires appropriate hardware (i.e., laptop/PC, webcam, microphone) and specific software (e.g., video conferencing tools, document sharing tools) 	<ol style="list-style-type: none"> 1. Have awareness of engagement levels throughout period of data gathering 2. Ensure technology training is available for research staff if needed 3. Be flexible in times available for participation 4. Note how interruptions may affect the quality of data and rapport
Online /Video Interviews	<ol style="list-style-type: none"> 1. Availability (greater time flexibility) 2. Able to get insight from gestures/body language 3. Participants can show visual supports to their discussions 4. Create an informal atmosphere where conversation is in a personal space 	<ol style="list-style-type: none"> 1. Some participants did not want to be on video 2. More likely to be late/not show up if video interview than face to face 	<ol style="list-style-type: none"> 1. Introductions made through gatekeepers to facilitate rapport building 2. Asking attention grabbing questions 3. Introductions discuss expectations of video/audio and back up options 4. Introductions build a relationship and therefore more commitment to showing up
Observation	<ol style="list-style-type: none"> 1. Chat features and sharing screen features allowed opportunity for observation 2. Virtual events increasingly host networking opportunities between participants 	<ol style="list-style-type: none"> 1. Not all observation opportunities transitioned to digital 	<ol style="list-style-type: none"> 1. Use networking opportunities hosted by event organizers
Online workshops/action research	<ol style="list-style-type: none"> 1. Can bring together people from different geographies with ease 2. Can increase the number of participants and therefore engagement from firms 	<ol style="list-style-type: none"> 1. Disengagement - difficult to get all participants to engage equally 2. More difficult for participants to collaborate and coordinate during group-based activities (some in-person activities may not be possible in a virtual environment) 3. More difficult to facilitate and keep track of group-based activities and outcomes 4. Given the use of multiple virtual tools, participant training may be required 5. Participant fatigue in sessions longer than 1 hour 6. Quality of outcome: unable to achieve solutions similar to those developed in person 	<ol style="list-style-type: none"> 2. Use chat feature for simultaneous observation of all participants 3. Use appropriate video conferencing software that enables participants to work in separate virtual meeting rooms to complete individual/group-based activities 4. Ask participants to keep their video on throughout the online sessions and request everyone has a quiet place to work where possible 5. Ensure participants can notify their group/facilitators if they need to step away 6. Establish clear communication rules (e.g., raise hand if someone wants to speak or has a question) 7. Use a separate team discussion board to enable research staff communication during workshop/session 8. Ensure participants are familiar with the virtual tools used and ensure training is available if needed 9. Ensure a more active role from facilitators in coordinating task completion 10. Reach out to anyone not participating 11. Ensure technology and task support in a separate virtual meeting room to support participants experiencing technology or process issues

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Note

1. Photo taken from the researcher's own data collection. Names and photos are blurred to preserve anonymity.

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