Understanding the Impact of the COVID-19 Pandemic on Research Administration in Canada

Anita Sharma, Ph.D., CRA
Thompson Rivers University

Abstract: *Like many services globally, the sudden work-from-home mandate due to the COVID-19 pandemic in 2020 disrupted research at Canadian post-secondary and affiliated organizations. Research administration professionals, who are an integral part of the research enterprise at these organizations, and who support and manage research activities were no exception and struggled to keep up with this challenging and unexpected situation. Not only adjusting in-house policies and procedures but research administrators were also swamped with distilling information received from external funders who were likewise adjusting their guidelines and policies for current and future funding programs. Moreover, the priority was to keep up with the COVID-19 special calls for funding that usually provided shorter response times. At the same time, research administrators were grappling with adapting to new online communication technology and finding the best ways to maintain work-life synergy. In this chaotic period of uncertainty, emotions were high, and communication was key. This study explores how research administration professionals in Canada adapted to this new reality and what lessons were learned. Through a national survey, the research administration community reflected on the following themes: i) Challenges experienced in setting up the new working environment; ii) Technostress; iii) Workload, productivity, and work-life balance; iv) Relationships among colleagues and with faculty, and v) Adaptability to the reality and future work culture desire.*

Results of the survey indicate that although Canadian research administration professionals experienced challenges due to abrupt shifts in their workplace, they were creative, resilient, and flexible enough to steer through this testing period. The inherent/acquired technological capabilities, efficient communications among coworkers and with faculty, and strategies they used during this time to stay productive and efficient helped most of them to adapt well to this situation. Some of them struggled to keep a work-life balance, especially those with young children, however, flexibility, control over their time, and proven productivity during this time inspired them to desire a remote and/or hybrid work culture even after the pandemic is over.

Keywords: *COVID-19 pandemic, Research Administration, Work-from-home, Working environment, Adaptation, Technostress, Workload, Productivity, Work-life balance, Future work culture*

Introduction

Anyone who has conducted a clinical research study at an academic institution knows how complex and challenging the process can be. Barriers to successful execution often begin during start-up and may include poor study design, inappropriate outcomes, the length of time protocol development can take, and limited resources to navigate the process (Al Dalbhi et al., 2019; Alak et al., 2014; Campbell et al., 2015; Cullati et al., 2016; Djurisic et al., 2017; Duley et al., 2008; Gallagher et al., 2013; Higgins et al., 2010). The impact of these barriers can be far-reaching and include potential lost opportunities for extramural funding and industry partnerships. It can also lead to investigator frustration and disengagement, reduced collaboration across institutional departments, wasted time and effort for participants, and ultimately, fewer meaningful studies, discoveries, and translations (Yordanov et al., 2015). In a competitive research environment, it is critical to have a well-written and feasible protocol to get through the IRB process smoothly and be successful in execution.

In early 2020, the world faced a unique challenge when the SARS-CoV-2 virus caused the COVID-19 pandemic that led to global health, economic and social crisis. It forced the sudden shutdown of educational institutions, businesses, and public places to contain the spread of the virus and maximize social distancing. Millions of people were forced to work remotely around the world. Indeed, the organization Eurofound reported that due to the pandemic, approximately 50% of Europeans worked from home (at least partially) as compared with 12% before the emergency (Eurofound, 2020). In Australia, France, and the United Kingdom, 47% of employees teleworked during lockdowns in 2020. In Japan, which did not implement a nationwide lockdown, the teleworking rate increased from 10% to 28% between December 2019 and May 2020 (OECD, 2021). Based on an online survey to measure the impacts of COVID-19 conducted at the beginning of the shutdown (March 2020), Statistics Canada reported that 4.7 million Canadians who did not normally work from home started to in response to the pandemic (Denis, 2020). A year later, as of February 2021, 32% (3.1 million) of Canadian workers between the age of 15 and 69 were still working from home compared with 4% in 2016 (Statistics Canada, 2021).

At the Canadian post-secondary organizations, due to the forced lockdown, classroom learning quickly changed to online learning, non-essential research activities almost stopped, and the staff was sent home to work remotely to contain the spread of the virus and to preserve the health and safety of everyone involved. Research administration professionals were no exception. They had to make significant adjustments in their operations to continue providing quality service to faculty and students involved in research activities. Research administration professionals, being an integral part of an institution's research enterprise, develop, manage, and administer research support activities. They play a variety of roles in supporting faculty through a research grant life cycle, i.e., pre-award phase, award phase, and post-award phase (Grants.gov, n.d.; Cañada College, n.d.). Broadly, the pre-award/grant phase (pre-grant facilitation) involves prospecting for funding opportunities, consulting faculty for proposal development including budget development and various other components of the applications, ensuring compliance with equity, diversity and inclusion requirements of funders, ensuring data management plans, open access plans and knowledge dissemination plans are well written, reviewing and editing applications,

and submission to funders; the award phase involves notification of award and award set-up after receiving the funding; and the post-award/grant phase (post-grant facilitation) involves helping faculty in ensuring research is conducted in compliance with the institution's and sponsors' policies and procedures, supporting the implementation of the project/program, navigating through student hiring, purchasing along with final reporting, assisting with transfer of funds, grant extensions, and grant closeout.

Research administrators at all levels faced challenges from the sudden changes in their focus due to COVID-19. Leadership struggled to develop effective needs assessment plans at the beginning of the pandemic to help faculty evaluate the need to continue their research activities and have *Individual Research Continuity Plans* in place, by keeping in mind the limited or paused access to research space, equipment, facilities, and staff availability and, more so, having a plan in place to quickly ramp down the research activities in the wake of quickly evolving conditions. Along with adjusting in-house policies and procedures, operational research administration professionals were swamped with distilling information received from sponsors who were also adjusting their guidelines and policies for current and future funding programs. Moreover, keeping up with the special rapid calls for COVID-19 research with shorter response times was the priority among the other routine grant facilitation activities.

Before the pandemic, work-from-home (WFH) was not practiced widely and was considered 'a *luxury for the relatively affluent'* (Desilver, 2020). Such an arrangement was voluntary and for those who were able to perform remotely. Studies have shown that planned WFH, in general, has its advantages and disadvantages (Van Steenbergen et al., 2017; Konradt et al., 2003). COVID-19, however, induced a sudden shift in the working environment without any opportunity to plan and provide technical training or resources required for most employees who were introduced to this abrupt shift to remote work. Thus, the mandated WFH leading to the sudden shift in the working environment along with the imminent shift in research priorities caused research administration professionals to struggle with adapting to this sudden change to not only keep up with their daily duties but to adjust their family responsibilities. As the work and home boundaries were blurred, notably, for people who were taking care of their underage children because schools and daycares shut down, the situation further complicated their challenges. This becomes more relevant to research administration professionals as research administration is often a female-dominated profession (Clark & Sharma, 2022; Preuss et al., 2020). Similarly, the challenges are exacerbated for people with personal pre-conditions and/or of people in their care.

The current study thus investigates the impact of the COVID-19 pandemic on research administration professionals in Canadian post-secondary and affiliated research organizations to understand their challenges in this unprecedented time, how they adopted and adapted (if so) to this new reality (what factors helped or hindered their adaptation), what lessons were learned and, how this might impact the future work culture and practices. This requires a systematic understanding of the impact of this changed work arrangement on the Canadian research administration landscape. With almost 1,000 members, the Canadian Association of Research Administrators (CARA) is the only national body for research administration professionals in Canada, and therefore, CARA members were surveyed for this study to capture their firsthand

challenges and experience WFH during the pandemic as a representation of Canadian research administration. Specifically, this study explores the following themes: i) Challenges in setting up the new working environment (working space, ICT infrastructure, network availability, and performance issues); ii) Technostress (techno-overload, techno-invasion, techno-complexity); iii) Workload, productivity, and work-life balance; iv) Relationships among colleagues and with faculty; and v) Adaptability to the new reality and future work culture desire.

This article includes a literature review on the impact of COVID-19, WFH in general, and the other relevant literature including the only USA study investigating the remote work experience of research administrators during COVID-19 at the time of conducting this study; methodology; the results of the current survey, which will include both quantitative and qualitative response reflections; and a discussion comparing the study outcomes with the existing literature. Concluding remarks include recommendations for future work culture.

Literature Review

Many studies have reflected on the impact of COVID-19 on remote work affecting various aspects of the lives of teleworkers. These range from stress due to technology dependence (Wang et al., 2020; Donati et al., 2021; Prabhakaran & Mishra, 2012), to impact on employee health, job satisfaction, and well-being (Niebuhr et al., 2022; Sharma & Vaish, 2020; Schade et al., 2021; Xiao et al., 2021), impact on productivity, engagement, and mental stress (Galanti et al., 2021), and work-life balance (Chu et al., 2022) and such. At the time of preparation of this manuscript, only one survey had explored the impact of COVID-19 with the US research administrators (Akioka & Caban, 2020b) on aspects such as their work efficiencies and productivity, frequency of communication, working relationship with colleagues, and feeling of isolation. This current study is the first to explore the impact of COVID-19 with Canadian research administration professionals in a systematic way that encompasses the challenges faced from establishing workstations at home, technological stress, increase in workload and impact on productivity and efficiency, as well as how the social isolation impacted the working relationship with faculty and colleagues, work-life balance and future work-culture perception.

Like most, research administrators were forced to the sudden WFH which they were not familiar with before the COVID-19 quarantine mandate. One of the challenges was establishing their working environment at home. Having a dedicated space for their workstations might not be feasible for all as family members needed to share the space with their working-from-home partners, children taking online classes/working from home, and other members. Moreover, families with young children were impacted by the disruption of childcare support services and as a result, the distractions that were caused by young children. Additional challenges included having appropriate and well-functioning information communication technologies (ICT) infrastructure at home (Niebuhr et al., 2022), having uninterrupted internet access, access to IT support, and access to and adapting to new online virtual platforms, and such. Understanding challenges with workstation set-up is critical as these challenges and satisfaction with workspace indoor environmental factors have been reported to decrease overall physical health and mental well-being (Xiao et al., 2021). A Statistics Canada (2021) survey also reported that teleworkers

who struggled with having inadequate physical workspace or experienced difficulty with internet speed and accessing work-related information or devices had caused people to be less productive during the pandemic.

One of the revolutionary shifts COVID-19 brought was heavy dependence on the use of ICT and the increased availability of various digital/virtual platforms. Modern technological tools have many positive effects on work practices and can enhance employee efficiency (Brynjolfsson & Hitt, 2000) and productivity (Tu et al., 2008). Although suddenly many virtual platforms (such as Zoom™, Microsoft Teams™, and Skype™ for Business) were made available to research administrators, the real challenge was to quickly learn these virtual platforms without any formal training. For some, adopting and adapting to such technology is not easy (Prabhakaran & Mishra, 2012) and this can lead to anxiety (Marcoulides, 1989) and stress (Salanova et al., 2013); better known as 'technostress'. The term technostress first appeared in Craig Brod's book titled '*Technostress: The human cost of the computer revolution*' and he defined it as "a modern disease of adaptation caused by an inability to cope with new computer technologies in a healthy manner" (Brod, 1984). Arnetz & Wiholm (1997) defined it as a "state of arousal observed in certain employees who are heavily dependent on computers in their work". The latest definition accepted in the literature is "stress experienced by the end users in organizations as a result of their use of ICTs" (Ragu-Nathan et al., 2008, pp.417-18). Tarafdar et al. (2007) and Ragu-Nathan et al. (2008) have described five accepted techno-stressors, namely: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. Techno-overload describes situations in which using new and different communication platforms (as was the case during COVID-19) leads to frustration and distress; techno-complexity describes situations where the complexity associated with ICTs leads users to feel inadequate regarding their computer skills and forces them to spend time and effort in learning and understanding ICTs; techno-invasion describes the invasive effect of ICTs in situations where employees can be reached anytime and feel the need to be constantly connected, thus blurring work-related and personal contexts; techno-insecurity refers to situations where users feel threatened about losing their jobs; and techno-uncertainty refers to the constant changes and upgrades of software and hardware that may impose stress on employees. In contrast, in a study with 222 university instructors who shifted to online teaching during the COVID-19 lockdown, Saleem et al. (2021) reported that the technostress worked positively on their performance. However, they found training and creative self-efficacy benefited the employees to cope with technostress and performance issues.

In the current study, research administration professionals were surveyed to understand the impact of the following most relevant types of techno-stressors affecting the profession: i) Techno-overload—as on average, during COVID-19 our dependence on technology became so heavy that it was not unnatural to feel overwhelmed and stressed; ii) Techno-complexity—understanding and learning the complexities of various virtual platforms on the go while performing day-to-day duties to maintain continuity at work further seemed to add to the stress; and iii) Techno-invasion—lastly, employees' personal and work lives were so integrated that there was an expectation and need to be constantly connected leading to more stress.

Workplace isolation was another key challenge introduced during COVID-19. Face-to-face

interactions were diminished, and the only option was virtual communication. This change had a significant impact on coworkers and clients. Umishio et al. (2022) reported that although it was easier to concentrate on work and refresh at home, workers experienced challenges associated with business communication from home. The US survey (Akioka & Caban, 2020b) with research administrators reported that there has been a decrease in communication between team members and other campus support units, which in part contributed to feelings of isolation. Respondents reported that hallway conversations, drop-ins, coffee/water cooler chats which were part of the daily work environment and quick ways to share information were all things of the past.

In general, there was a perception that the workload has been increased for research administration professionals. There were, however, many obvious reasons to believe this. Increased and timely communication was a top priority during the COVID-19 global crisis as faculty and students needed to be kept informed of the uncertainty and the changing guidelines in a timely fashion more than ever. Canadian federal funding agencies delegated COVID-19-related post-award responsibilities to the university and college research administrators which added to the workload; although research was on hold, the grant facilitation activities increased (for instance, the author witnessed a 35% increase in grant submissions at their institution). In fact, in the US research administrators' survey, 62% reported an increase in their volume of work (Akioka & Caban, 2020b). Funding agencies such as the NIH reported a 10% increase in the number of grant applications received from May to June 2020 compared to the same funding cycle in previous years (Lauer, 2020). Similar situations were also reported in other fields. In a survey conducted in twenty-two offices across two weeks in November-December 2020 in Japan (with 916 workers, two-thirds of whom were technical staff in research and development or design and engineering), Umishio et al. (2022) reported that the average workdays at home increased from 0.1 to 1.1 days/week due to pandemic. In another survey conducted with 988 respondents, Awada et al. (2021) also reported that the number of hours spent at a workstation increased by approximately 1.5 hours during a typical WFH day. Longer hours were reported by individuals who had school-age children, owned an office desk or an adjustable chair, and had adjusted their work hours. In a Statistics Canada (2021) survey, 35% of all new teleworkers (i.e., teleworkers who did not usually WFH before the COVID-19 pandemic) reported working longer hours, with managers doing so in greater proportions (51%).

Among increased workload, change in the routine work environment, social isolation and quickly evolving situations at work, and with the pandemic, one might perceive productivity and work efficiencies impacted negatively and stress levels increased. In a study with Japanese workers, Morikawa (2021) revealed that the mean WFH productivity relative to working at the usual workplace was about 60%–70% and that productivity was affected by both individual and firm characteristics, although WFH productivity for highly educated and high wage employees was slightly reduced. In contrast, in the US survey, 62% of research administrators reported that they have been able to increase work efficiencies and get things done more quickly while working remotely (Akioka & Caban, 2020b). Many reported there were fewer interruptions and reduced distractions while working remotely. Additionally, survey respondents indicated they had more time to dedicate to work and were more productive because they no longer had a work commute. Although, a small portion indicated more interruptions because of new or more home

responsibilities, especially for those dealing with in-home schooling. However, this same group indicated no significant drop in productivity. Statistics Canada (2021) found that over 90% of 'new teleworkers', reported being at least as productive at home as they were previously at their usual place of work. The remaining 10% reported accomplishing less work per hour while at home than at their usual work due to a lack of interaction with co-workers, family care commitments, inadequate workspace, or IT equipment. In a study reflecting on WFH productivity for academics, AbuJarour et al. (2021) found that both personal and technology-related factors affect an individual's attitude toward working from home and productivity. Awada et al. (2021) also suggested that the overall perception of the productivity level among workers did not change relative to their in-office productivity before the pandemic. They further suggested that female, older, and high-income workers were likely to report increased productivity and that productivity was positively influenced by better mental and physical health statuses, increased communication with coworkers, and having a dedicated room for work.

Work-life balance is an ability of an individual to keep a balance between time allocated for work and other aspects of life, such as family responsibilities, personal interests, and social or leisure activities. Striking a balance between work and life has been an everyday challenge for working individuals. Work-life balance is an issue that is driven by a set of diverse factors. Workplace stressors might include workload, work intensity, availability expectations, institution culture, and customer service expectations (Costan, 2019). Work-life balance affects both men and women, although, in general, work-life balance is characterized as a balance between work and childcare (Glasgow & Sang, 2016). This can be because gender inequalities remain evident in our societies as most women still struggle more with work-life balance in comparison to men due to the gendered social orders that are sustained through the prevalent ideologies in social discourse (Ruzungunde & Zhou, 2021). Indeed, the research administration field tends to be represented mostly by women with a gender ratio of 4:1 female to male (Clark & Sharma, 2022; Preuss et al., 2020). In a study on the profession of research administration, Shambrook (2012) reported consistent and significant associations between elevated levels of work stress and work-life balance; those with elevated levels of work stress experience poor work-life balance. COVID-19 has further exaggerated this problem. With restricted mobility, families were contained to the house and life presented more responsibilities in addition to childcare, for example, caring for parents, partner/spouse, house chores, and home-schooling among other activities. These responsibilities competed with the demands and stress of sudden shifts in the workplace as discussed above. Moreover, working longer hours as explained earlier likely makes it challenging to achieve a good work-life balance. In Japan, 15% of respondents highlighted overwork due to the blurring of boundaries between work and life as a disadvantage of teleworking during the pandemic (OECD, 2021).

The abrupt shift to WFH during the COVID-19 pandemic, evolution and acceptance of various digital platforms, and self-efficacy to manage their work and life have impacted how employees are thinking about the current and future work culture. In various surveys, employees from many professions are opting for an option for WFH even when the COVID-19 pandemic is over. In the Statistics Canada survey (2020), 80% of new teleworkers (men and women) indicated that they would like to work from home for half of their time, and 15% reported a desire to work

full time from home. Akioka & Caban (2020b) reported that many US research administrators had indicated wanting to continue telework or some sort of hybrid work arrangement after the pandemic ends. Thus, it was imperative to explore the Canadian research administration professionals' desire for future work culture.

Methodology

A survey tool (see appendix) was created and implemented using SurveyMonkey (SM). The portions of this survey tool were adapted from a previous study conducted in the USA (Akioka & Caban, 2020a), which was the only other survey with research administrators known at the time of conducting this study. The survey contained twenty-six multiple-choice questions and five open-ended questions asking for written responses. The questions were divided into the following five study themes: i) Challenges experienced in setting up the new working environment (workspace, ICT infrastructure, network availability, and performance issues); ii) Technostress (techno-overload, techno-invasion, techno-complexity); iii) Workload, productivity, and work-life balance; iv) Relationships with colleagues and faculty; and v) Adaptability to the new reality and future work culture desire. The survey tool was pretested with a few research administrators to check that the questions were reflecting the research objectives and were presented clearly before full implementation.

The survey was shared with the Canadian Association of Research Administration (CARA) community by posting on the CARA listserv for two weeks from March 22 to April 4, 2021, with an email reminder sent at the start of the second week. As a national professional organization for research administrators, CARA provides a critical interface between all stakeholders (universities, colleges, research institutes, and hospitals) in the management of the research enterprise. CARA members perform a variety of roles in supporting research excellence in Canada, including research development, pre-and post-award non-financial contracts and grants management, financial management, industry liaison, research ethics, regulatory compliance, and research communication. Ethical review and approval were not required for the study on human participation per the institutional requirements. The participants provided their informed consent to participate in the study by taking the survey. Responses were collected anonymously, and participation was voluntary. A total of 135 responses were obtained (representing a response rate of about 15%). A few Starbucks™ coffee gift cards were provided as an incentive to respondents, who opted to share their email, by random selection. The multiple-choice question responses were analyzed using the compare rules, filters, and cross-tabulation report in SM. Statistical significance was calculated using a t-test at a 95% confidence level (p<0.05). NVivo was used to analyze open-ended questions. The preliminary results of this survey were shared at the annual virtual CARA conference in May 2021 (Sharma, 2021).

Results and Discussion

Respondents' Demography

The Canadian research landscape spans universities, colleges, research institutes, hospital research centers, federal research laboratories, and other research-intensive organizations. An institutional research enterprise is supported by various stakeholders including staff supporting research development and management, partnership development, compliance, communication, legal, finance, human resource, IT, facilities, marketing, advancement, and such. These stakeholders, as mentioned earlier, play a variety of roles in supporting faculty through the research grant life cycle (the pre-award phase to the award phase to the post-award phase). The survey asked the CARA membership the following four questions to understand the demographic distribution of the survey respondents: organization type, area of work, type of work, and years in research administration.

Most respondents were from Canadian universities (79%, Figure 1A) and working in research (81%, Figure 1B) and were managing both pre-and post-award activities (57%, Figure 1C). Thirty-nine percent (39%) of respondents were within five years of their career, those within 6-10 and 11-20 years were both represented almost equally (26% and 24%, respectively) in the survey, and those with 20 years plus career span represented only 10% in the survey (Figure 1D). One question 'Are you currently working from home?' was asked to ensure that the survey captured the responses and experiences of those working from home during COVID-19, and 99% of the respondents were working from home
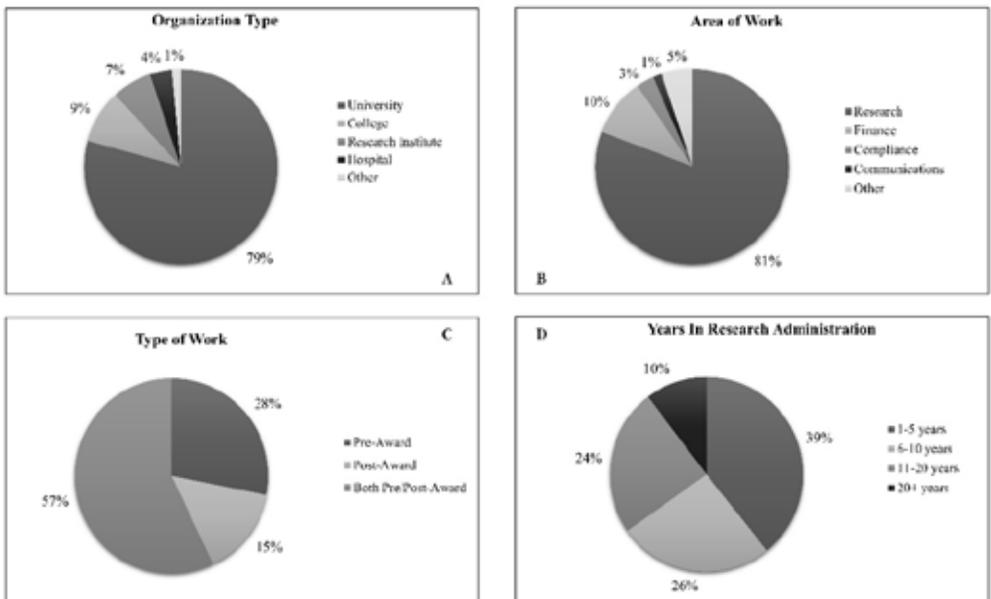

Figure 1. Respondents' Demographic Distribution

The rest of the survey questions were grouped into the following five study themes to understand COVID-19-led challenges and how the research administration professionals adapted to these challenges and what lessons were learned.

Theme 1: Challenges experienced in setting up the new working environment

1a. Workspace and ICT infrastructure, network availability, and performance issues

The COVID-19 pandemic-mandated isolation resulted in a sudden shift in the working environment from an office to a home. The first challenge was setting up workstations at home and dealing with related issues such as uninterrupted internet availability and its seamless performance. The following two questions assessed this challenge. The first survey question asked, 'Did you struggle with setting up appropriate ICT infrastructure and working space?' Responses were equally divided between those who struggled (50.4%) and those who did not struggle (49.6%) in setting up their workstation at home.

The second question asked, 'How often did you struggle with having uninterrupted internet availability and Internet performance issues?' Only about a quarter of respondents (23%) reported that they were frequently struggling with this problem and the rest either struggled 'rarely' (64%) or 'were not impacted' (13%) by internet availability and performance issues (Figure 2).
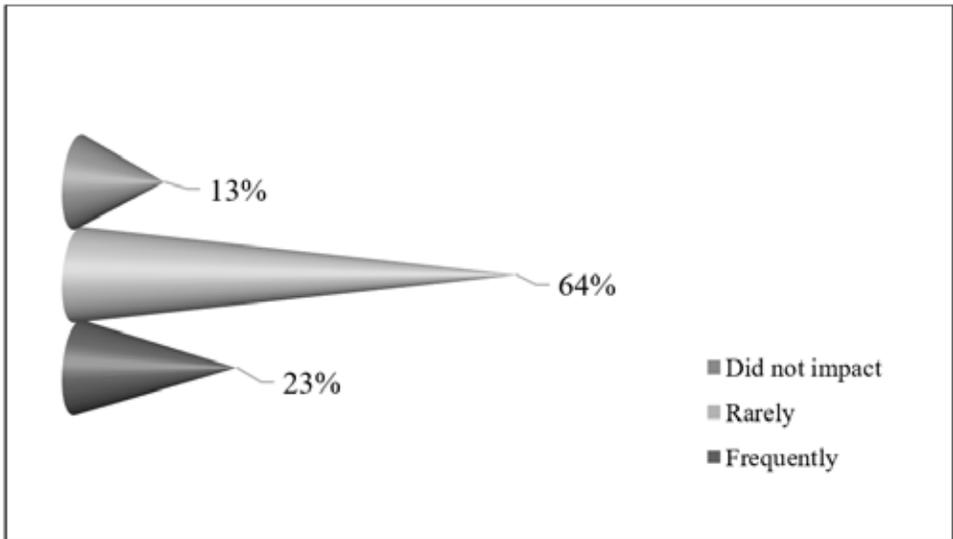

Figure 2. Internet Availability and its Impact on Performance

The data thus indicates that although half of the research administrators struggled in setting up ICT infrastructure and working space at home, internet availability and performance issues were not impediments to most (77%). This might have been one of the factors contributing positively to the respondents' increased productivity during the pandemic (as discussed later in Theme 3) as the opposite has been cited in the Statistics Canada (2021) survey indicating that teleworkers who struggled with having inadequate physical workspace or experienced difficulty with internet speed and accessing work-related information or devices had caused people to be less productive during the pandemic. Furthermore, Xiao et al. (2021) reported that workstation set-up and satisfaction with workspace indoor environmental factors impacted overall physical health and mental well-being.

1b. Preferred mode of communication

As normal in-person communication rapidly became a thing of the past and the regular place of work changed, employees had to learn and switch to new modes of communication to keep up with their day-to-day work life. Timely and accurate communication is key in the ever-changing research funding landscape, and it was even more so during this unprecedented time. The survey had five questions exploring the preferred mode of communication for research administrators. Three of these questions asked, 'What mode of communication did you most prefer before, during, and after COVID-19 subsides?', and two questions required respondents to indicate 'On average how many hours a week did you spend in meetings via these modes before and during COVID-19?' to further assess what mode of communication takes up most of their time.

Email remains the recognized standard for communication in research administration. The percent responses for email as the preferred mode of communication remained unchanged before and after the pandemic crisis subsides: 56% of respondents reported that email was their preferred mode of communication before the pandemic (Figure 3A) and 57% reported that email will remain their preferred communication mode after the pandemic subsides (Figure 3C). Although, email was used by a slightly higher number of respondents (61%) during the pandemic as the preferred mode of communication (Figure 3B). In fact, as discussed later in Theme 4, 71% of respondents reported that because of email as the communication mode, their work efficiencies to provide quality service to faculty either remained unchanged or increased during COVID-19.

It is interesting to note that 42% of respondents preferred in-person communication *before* COVID-19 but the anticipation of using the in-person mode of communication preference after the pandemic subsides dropped by 14% (Figure 3A, C). *During* the pandemic, in-person communication was replaced by the following in decreasing order: video conference (24%), instant messaging (10%), and phone (5%). Phone usage increased by 4% *during* the COVID-19 crisis (only 1% used it as the preferred mode *before* COVID-19) (Figures 3A, B). Notably, 13% of respondents indicated that they would continue to use video conferencing and instant messaging as the preferred mode of communication (Figure 3C). Video conferencing has been particularly favorable as it is considered to create a more inclusive environment for many, increases efficiency, helps in saving time by avoiding the commute, and increases audience reach. Moreover, webinars and virtual conferences provided more economically affordable opportunities for many which were not necessarily accessible before COVID-19.
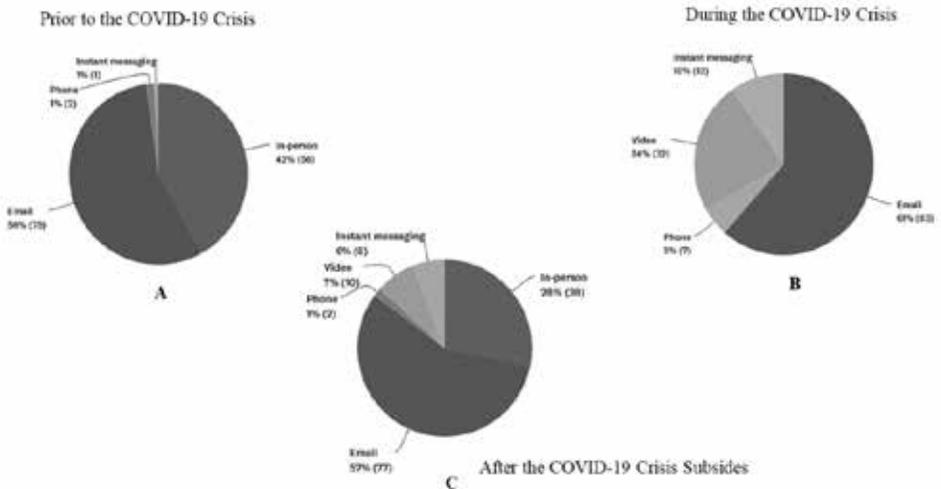
Figure 3. Preferred Mode of Communication Pre-, During, and Post-COVID-19

Figure 4 shows the weighted average of the number of hours per week spent communicating via different modes. *Before* COVID-19, respondents spent an average of 5 hr per week for in-person communication followed by 2 hr per week using other modes (phone, video, and IM). *During* COVID-19, video conferencing was more frequently used (5 hr/week), followed by IM (3 hr/week), and phone (2 hr/week). These responses demonstrate that research administration professionals adapted to the changing working environment caused by the pandemic. Their ICT awareness, the fact that email remained a recognized standard mode of communication, and the availability of a variety of collaborative and networking digital platforms made it easy for research administrators to adapt to the new communication tools.
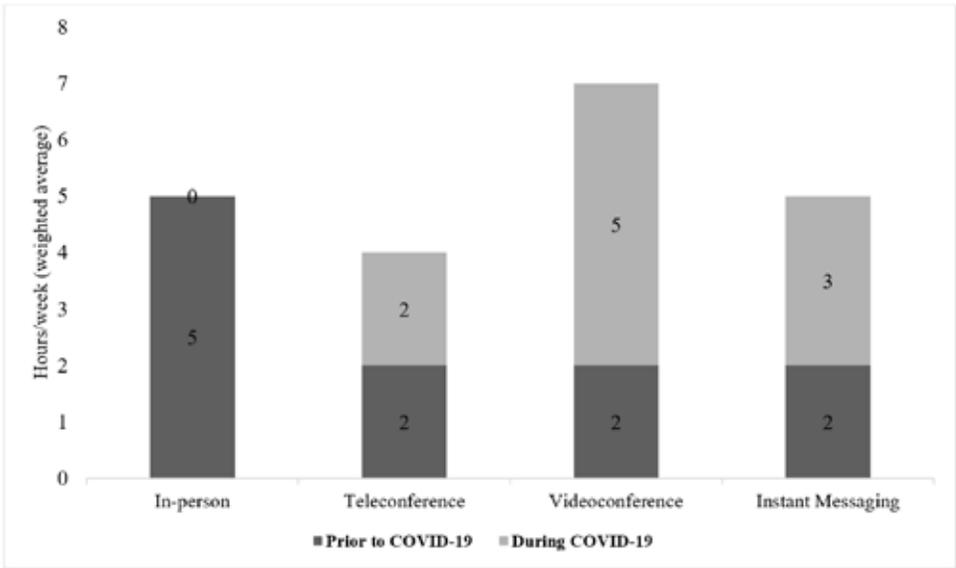
Figure 4. A Weighted Average of Time (Hours/Week) Spent Using Various Modes of Communication Pre- and Post-Covid-19

Theme 2: Technostress

In the virtual environment when employees had to quickly learn various virtual platforms such as Zoom™, Microsoft Teams™, Skype™ for Business, and such, it was not easy for all to adopt and adapt to technology equally, and reports in the literature show that this can lead to technostress (Prabhakaran & Mishra, 2012; Salanova et al., 2013). Through this survey, respondents were asked three questions reflecting on 'Did you feel frustrated and distressed due to techno-overload, techno-invasion, and techno-complexity', respectively. Half of the respondents (50%) felt frustrated with techno-overload 'sometimes', one-third 'did not feel frustrated', and a small number (16%) 'felt frustrated' by techno-overload (Figure 5). The opposite was true about the techno-complexity, i.e., only 15% felt frustrated by techno-complexity as compared to the rest (85%) who either 'did not feel' or 'sometimes' felt frustrated. A higher percentage (39%) felt frustrated by techno-invasion as compared to 60% who either 'did not feel' or 'sometimes' felt frustrated (Figure 5).

A higher percentage of the respondents felt frustrated with techno-invasion because work and

Did you feel frustated by various types of technostress?			
Response	**Techno-overload**	**Techno-invasion**	**Techno-complexity**
Yes	16%	39%	15%
No	33%	31%	51%
Sometimes	50%	30%	34%

Figure 5. A Impact of Various Forms of Technostress on the Respondents During Covid-19

life boundaries were blurred, and respondents felt the need to be constantly connected. Only 16% of the respondents felt that complex technology was introduced. As mentioned earlier, for those who work in the field of research administration, being technology savvy is a requirement of their work as they engage with many online systems in their daily work, and this appears to have facilitated their adoption and adaptation to the new virtual platforms and systems. In fact, with the availability of a variety of communication tools at their disposal, the ease of setting these up was mentioned as one of the reasons behind effective communication and unchanged or increased efficiencies in providing quality service to faculty during the pandemic. Moreover, video calls were considered an effective way to bring people together that might not have been possible in person (e.g., due to separate locations and schedules). The following statement by a respondent reflects the appreciation for the benefits of using virtual platforms: "*Can we talk about Techno liberation - I felt far more free, relaxed and had more time because of not having to go to in-person meetings!*"

Responding to the open-ended question, research administrators shared the ways they adapted to various modes of technostress. Taking time to learn technology is the most common strategy used by the respondents. They reported that they made sure to learn the new digital platforms and become comfortable with using them and made efforts to attend workshops and training offered by their employers. Setting up firm boundaries and time limits for working hours was the second most common strategy reported—keeping usual office hours and restricting working outside of those hours, not checking emails on phone outside of hours and turning off email notifications on phones to curb the temptation to check emails, followed by taking breaks frequently. Some of the other strategies noted include: Not having Microsoft Outlook™ and/or Microsoft Teams™ on their phone; Limiting the use of a variety of online platforms; Closing online platforms for a certain period to concentrate on given tasks; Reaching out for help from coworkers and institutional IT services; Having video conferencing free days; Making Friday afternoons non-mandatory work periods; and, Planning carefully for what they need to learn and blocking time in the calendar. The following statements by a couple of respondents reflect on the use of technology, equity, and accessibility "*We are using tools and technologies that existed before the pandemic but there was always some reluctance to be used commonly.*" "*I have learned that there is sufficient tech to support effective working from home and that it should be offered for any role possible (or a hybrid if (remote) not entirely possible) to improve EDI and accessibility.*"

Theme 3: Workload, productivity, and work-life integration

Anecdotally there was the perception among research administration professionals that the COVID-19 period was an exceptionally busy time. This might potentially be because they were working from home and their work and personal lives were very much hand in glove. Therefore, a couple of questions were asked to examine the possible change in the workload. 'Are you experiencing an increase in the volume of work or is it just perceived because you are working from home?' Secondly, 'If you saw a real increase in the volume of work, was it in pre-grant or post-grant or both areas?'

Seventy percent (70%) reported that they either saw a real increase (42%) in their workload or that they felt (28%) that there was an increase in the workload. Thirty percent (30%) did not report any change in the workload (Figure 6A). In responding to the question about the areas where they saw a change in workload, 47% of respondents reported that both pre-and post-grant activities increased (Figure 6B).
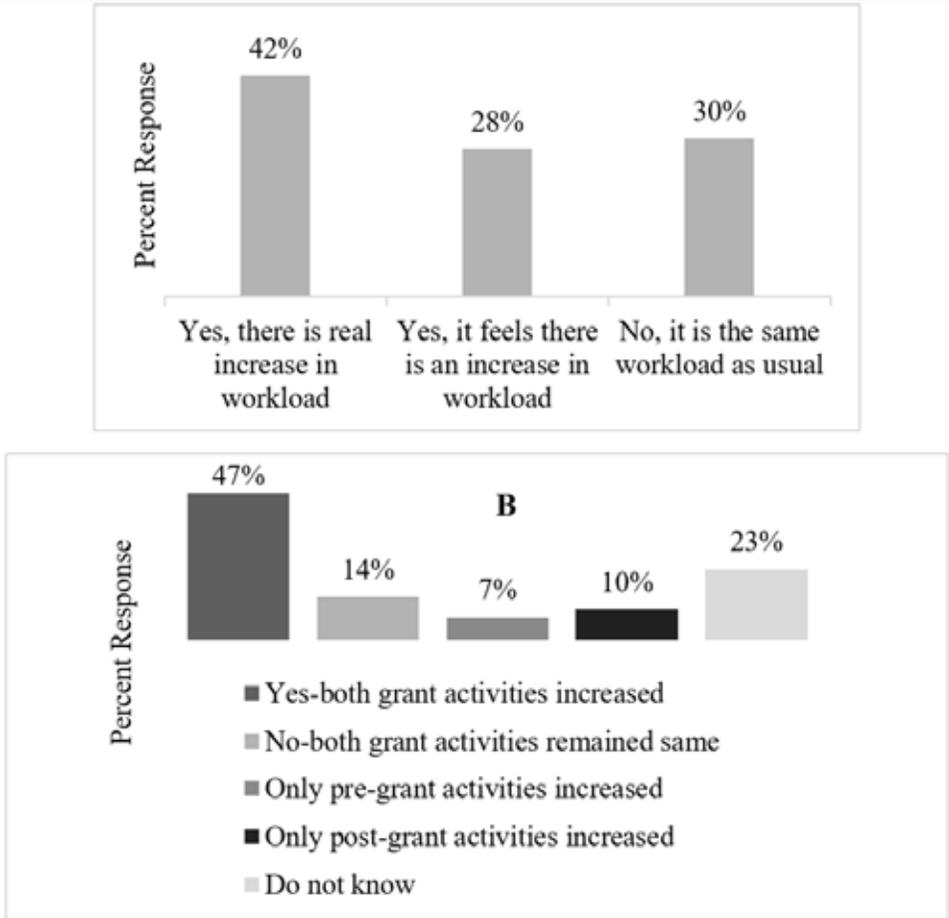

Figure 6. Respondents' Reflection on Workload (A) and Type of Workload (B) During Covid-19

One can argue that as the research was on hold faculty had more time to focus on writing and submitting grants, leading to an increase in pre-grant facilitation (Lauer, 2020; Akioka & Caban, 2020b). Similarly, an increase in post-grant workload was witnessed due to a quick turnaround in funding announcements for COVID-19-related research and due to additional administrative activities as a result of the federal funding agencies' efforts to accommodate various challenges researchers, trainees and students were facing due to forced shutdown, i.e., adjusting and communicating grant end dates to cover time lost due to paused/reduced research activities; administration of federal funding agencies' additional funding to faculty, trainees and students to reduce the financial impact due to COVID-19 on research activities and personnel (NSERC 2020; SSHRC, 2020) as well as similar adjustments to internally-funded research activities.

The survey also asked, 'Have you experienced an increase in work efficiencies and the ability to get work done more quickly while working remotely?' Sixty-three percent (63%) reported having an increase in work efficiency, 30% did not report an increase in their work efficiencies, and the rest (7%) did not feel remote working impacted their working efficiency (Figure 7).
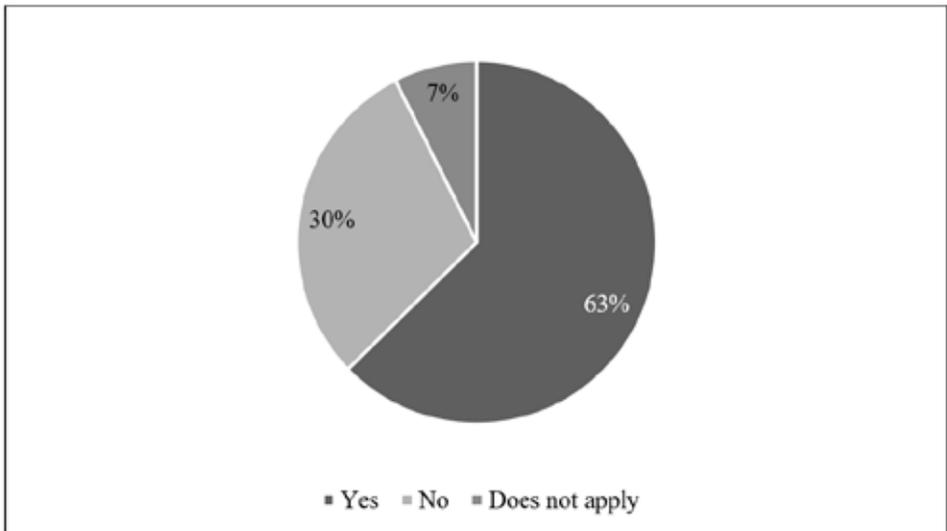

Figure 7. Respondents' Reflection on 'Did you see an increase in your work efficiencies during COVID-19?'

Research administrators in the US shared a similar experience—60% reported that their work efficiency was increased while working remotely, 62% reported they were doing more work, and 50% reported being more productive (Akioka & Caban, 2020b). According to the Statistics Canada (2021) survey, 90% of the new teleworkers reported being at least as productive working remotely as they were at their workplace.

Responding to the open-ended question on the factors that are attributed to their increased efficiency, the most common responses were: Fewer unanticipated interruptions (resulting from

less time chatting with colleagues, less drop-ins, less social interactions) and less distractions leaving more focused time and ability to control time; No commuting from home to office and for in-person on-campus meetings (it also reduced the stress going to work and saved time and they ended up working more); Going paperless and using electronic documents, e-signatures and SharePoint™ increased efficiency; Virtual faculty meetings rather than exchanging multiple emails providing feedback on their grant applications were considered better quality communications; Easier to set up a (remote) videoconference than an in-person meeting (which implies travel for some participants) and that virtual meetings usually take a lot less time and many more people can participate in virtual events; Working from home in terms of flexible hours allows a better work-life balance, having a more comfortable and quiet work environment, less stress and increased productivity. Similar responses were shared by the US research administrators as discussed earlier (Akioka & Caban, 2020b).

However, some respondents reported that they were missing opportunities for impromptu chatting with their colleagues. They also mentioned the things that used to be addressed via a 'quick pop into an office' are now a phone call or email or scheduled Zoom away and this leads to a delay in processes, which they felt was not good for morale. Some respondents felt they were not efficient due to home distractions and thus it was harder to be focused on work tasks and felt Zoom fatigue as well as burnout. The Statistics Canada (2021) survey with new teleworkers also reported that about one in five of those who reported being less productive during the pandemic reported a lack of interaction with co-workers as the main reason they accomplished less work.

When asked 'Did any family factors impact your work productivity?' there was an equal divide. Family factors impacting work productivity were obvious, i.e., Homeschooling; childcare/daycares and schools were closed; Family responsibilities and family distractions/difficulty to have uninterrupted time; Family members' care that also includes COVID-19 impacted members; Shared working spaces with spouse and children, and not having dedicated workspace, thus adjusting with needs of the family members; and various personal issues. The following statement by one of the respondents sums up this situation, "*Wearing multiple "hats" like mother, wife, teacher, pet owner and my work-job. That is a lot of hats to wear constantly.*" The Statistics Canada (2021) survey also reported that having to care for children or other family members and having an inadequate physical workspace impacted productivity during the pandemic.

Theme 4: Relationships with colleagues and faculty

CARA members were also asked to reflect on their relationships in general with their colleagues and faculty members. Fifty-four percent (54%) felt more isolated from their colleagues, 33% felt no change and 13% felt closer to their colleagues *during* COVID-19 (Figure 8A). When asked to reflect specifically on 'how COVID-19 impacted communications within teams and with faculty,' 53% reported they communicated more frequently with their colleagues *before* COVID-19, compared to 27% who communicated more frequently *during* the crisis, and the rest (20%) felt no change in communication within teams. Similarly, in the US survey, half of the respondents felt more isolated from their colleagues, however, their frequency of communication *before* (36%) and *during* (32%) of the pandemic did not change much (Akioka & Caban, 2020b).

Interestingly, when asked about the impact on communication with faculty, 57% of Canadian research administration professionals reported business as usual, 16% communicated more frequently *during* the crisis, and 27% felt they communicated more frequently with faculty *before* the crisis. (Figure 8B).
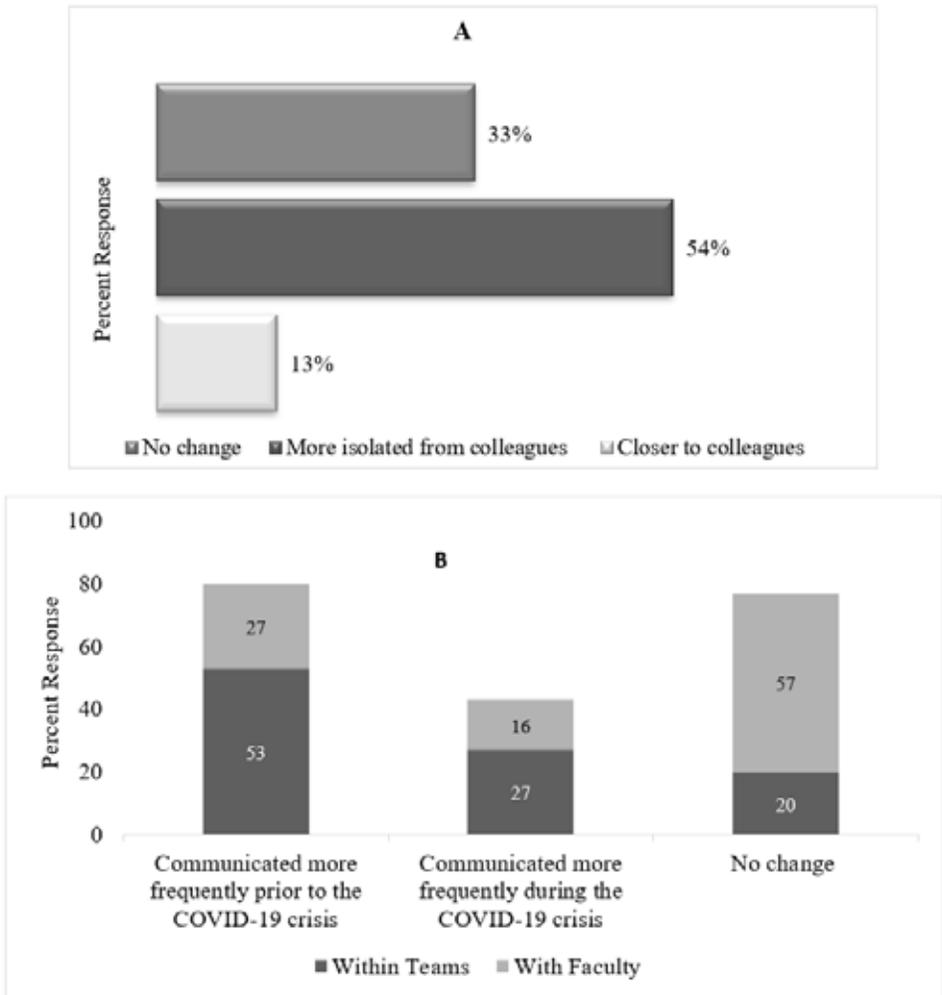

Figure 8. Impact of COVID-19 on the Relationships with Their Colleagues (A), Communication within Teams, and with Faculty (B)

Although slightly above half of the members felt isolated and saw a drop in communication among their teams during the pandemic, for the majority (68%), their commitment and efficiency in providing a quality service to faculty were unchanged, and 19% saw their efficiency improve during the COVID-19 crisis as compared to 13% who reported greater efficiency before the COVID-19 crisis.

The respondents were also asked to reflect on the factors contributing to efficiency. The biggest factor contributing to unchanged or increased efficiency was effective communication with faculty (73% either witnessed business as usual or an increase in communication frequency, Figure 8B) *during* WFH. The following two points were more frequently mentioned as the reasons behind effective communication: i) the availability of a variety of communication tools at their disposal, and the ease of setting these up, and ii) email as the most preferred tool of communication, which is used to communicate with faculty in routine day to day work. Some of the other factors that helped in increasing their efficiency include lack of interruption, no commute, flexibility working from home that decreases stress, access to virtual meetings which were easy to set up, and faculty being easily available online during the pandemic. Overall, the majority of the respondents (87% of whose efficiency was unchanged or improved during the pandemic) felt providing quality service to faculty is what they do, and COVID-19 only changed the way they provided services, although, it meant they had to work more hours to provide the same quality service.

However, for some, delivering a quality service includes face-to-face meetings so that they get to know the faculty, and they felt that this situation has limited their ability to make a proper connection. They missed the time when researchers used to pop by their offices to ask questions and have meetings.

Theme 5: Adaptability to the new reality and future work culture desire

A significant number (72%) of the respondents adapted to the new norm easily, while 28% struggled. Twenty-seven percent (27%) reported a preference for WFH, and 70% preferred to have a hybrid model. Only 4% preferred to have an in-person future work environment (Figure 9).
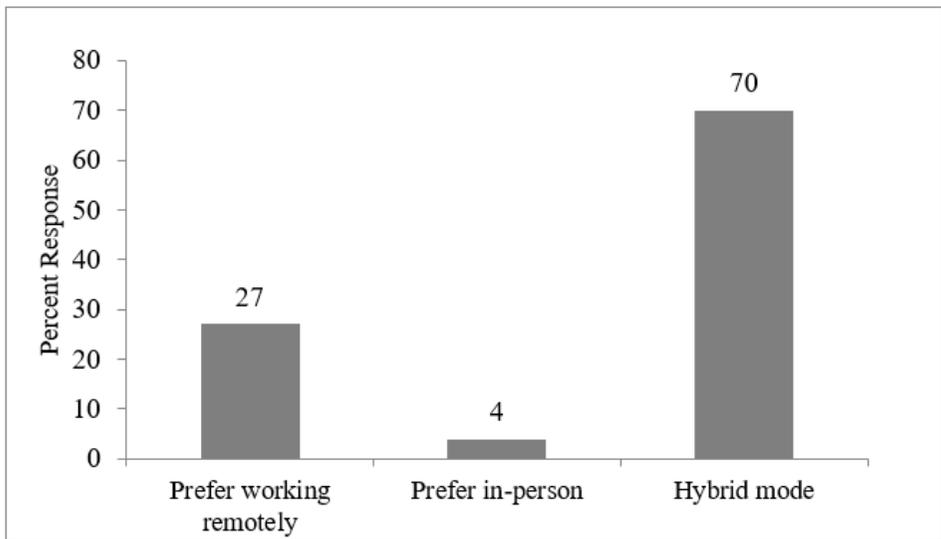
Figure 9. Preference of Working Environment Post-COVID-19

It is important to tease out what factors might have facilitated those who adapted well to this sudden change and why only 4% of respondents preferred to have an in-person future work environment. The two groups, (i) those who adapted well vs. (ii) those who did not, were compared for the factors that allowed them to adapt well or impeded those who had challenges in adaptation. Tables 1 and 2 show that in the group (ii) a higher percentage of respondents struggled in setting up their workspace (81%), dealing with family factors (76%), and felt isolated from their colleagues (65%) than the group (i) who adapted to the new norm easily (38%, 42%, and 49%, respectively). In both groups, family factors impacted respondents significantly for adapting/not adapting to the new norm. For group (i) who adapted well, the number of respondents who 'struggled due to family factors' was significantly lower (42%) compared to the other group (76%). Conversely, the number of responses of those who 'did not struggle due to family factors' were significantly lower (24%) in the group (ii) who did not adapt well as compared to 58% in the group (i).

Table 1. Comparison of the Impact of Setting Up Workspace and Family Factors (% Responses)

	Adapted easily (Group i)		Adaptation was a challenge (Group ii)	
	Struggled		Struggled	
	Yes	No	Yes	No
Setting up workspace and ICT	38	62	81	19
Family factors	42*	58#	76*	24#
*,#, 95% confidence level (p = .05)				

Table 2. Comparison of the Impact of Working Relationships (% Responses)

Adapted easily (Group i)			Adaptation was a challenge (Group ii)		
Working Relationship					
Felt Isolated	Closer to Colleagues	No Change	Felt Isolated	Closer to Colleagues	No Change
49	16	35	65	5	11
*,#, 95% confidence level (p = .05)					

Furthermore, Table 3 shows that group (ii) felt more frustrated and distressed due to the impact of the various modes of technostress. However, interestingly, when it came to future work preference (Table 4), a higher number (81%) of respondents in group (ii) preferred hybrid work compared to 65% in group (i). The results were significantly different for both groups for feeling frustrated/not frustrated due to techno-overload and techno-invasion except for the techno-complexity (Table 3).

Table 3. Comparison of the Future Work Preference (% Responses)

	Adapted easily (Group i)			Adaptation was a challenge (Group ii)		
	Techno-Overload	Techno-invasion	Techno-Complexity	Techno-Overload	Techno-invasion	Techno-Complexity
Felt frustrated and distressed	13**	34‡	13	27**	54‡	22
Did not feel frustrated and distressed	34†	28††	55*	11†	11††	19*
*,**, †, ††, ‡ 95% confidence level (p = .05)						

Table 4. Comparison of the Future Work Preference (% Responses)

	Adapted easily (Group i)			Adaptation was a challenge (Group ii)		
	Working Remotely	In-person	Hybrid	Working Remotely	In-person	Hybrid
Future work preference	32*	3	65	14*	5	81
* 95% confidence level (p = .05)						

Interestingly, like the Canadian study, besides all the WFH challenges, the US study (Akioka & Caban, 2020b) also showed that many research administrators indicated they would like to continue teleworking or some sort of in-person/telework hybrid after the pandemic ends. The study indicated that there is a desire that the pandemic will lead to changes in the perception of work culture and teleworking, especially when organizations trust the metrics that indicate more work can be accomplished from home. In the Statistics Canada (2021) survey, 80% of new teleworkers indicated that they would like to work at least half of their hours from home once the pandemic is over. Although only 15% would prefer to work all their hours from home after the pandemic. Importantly, perceived productivity at home appears strongly associated with the desire to WFH. Workers who reported accomplishing more work per hour while working from home indicated that they would prefer working most or all their hours at home much more often (57%) than all other workers (30%) (Statistics Canada, 2021). Appreciating the advantages of WFH, one respondent noted, "*I am quite surprised as to how easy it can be to work from home. It does have advantages for both the employer and the employee. The only disadvantage is the lack of in-person contact.*"

Conclusions

This empirical study focused on improving our understanding of the impact of the COVID-19 pandemic on the professional practice of Canadian research administrators. The research study included both quantitative and qualitative elements as part of the survey method. Moreover, insights have been generated across a range of pertinent areas, namely: i) Challenges experienced in setting up the new working environment; ii) Technostress; iii) Workload, productivity, and work-life balance; iv) Relationships among colleagues and with faculty; and v) Adaptability to the new reality and future work culture desire. The main limitation of the study is that it was focused on capturing the views of research administrators in Canada, although many of the insights gained are equally applicable to research administrators working in many countries across the world.

In conclusion, the current research identified that approximately half of the Canadian research administration professionals who took the survey struggled to set up their home workspaces, felt

isolated from their colleagues, and was not able to communicate the same way as they used to pre-COVID with their team members and missed impromptu conversations with their colleagues. About 40% struggled with techno-invasion and saw a real workload increase. However, the majority (90%) of research administrators were satisfied with their institutional support and 72% reported that they adapted to the new reality well. Moreover, a majority (63%) experienced an increase in their productivity, keeping up (68%) or enhancing (20%) their work efficiencies, and were able to keep providing faculty with the same (68%) or better (20%) standard of services as they were providing pre-pandemic (Figure 10 summarizes the key metrics). Overall, the survey provided evidence that the Canadian research administrators' community is creative, resilient, and flexible enough in adapting to new situations and can perform effectively during challenging times. As one of the respondents also noted, "*What I have learned during the 'new norm' is that we are all quite capable of adjusting to new situations and to being effective even under non-ideal conditions.*"

Figure 10. Summary of Key Cumulative Responses

Interestingly, the survey responses for the preference for future work culture were skewed more toward WFH and hybrid models as compared to in-person (only 4% desired in-person) culture as discussed above. Experiences of WFH have changed the way some of the research administrators perceive future work culture. The majority (70%) desire hybrid working conditions to continue and think that this arrangement is more equitable, and accessible, and will improve equity, diversity, and inclusion. As one respondent noted "*I see how hybrid working conditions (online/remote as well as in-person) are genuinely more equitable and accessible. Also, I appreciate the fact that mental health is more acknowledged, along with the concept of work-life balance.*" Similarly, it was felt that the "*requirement to be onsite to perform research administration is outdated.*" Moreover, a hybrid work arrangement allows for overcoming the one concern that was shared by many respondents regarding the importance of human connection in our daily work lives as one noted, "*The value of*

human connection and contact should not be overlooked." The hybrid work arrangement provides benefits of both work arrangements (face-to-face and remote), such as more flexibility, all the benefits of lesser commute ultimately lowering the carbon footprint, human connection, work-life balance, and less stress but same or better efficiency and productivity providing quality service to faculty.

As the COVID-19 pandemic has been easing out, it would be interesting to conduct a follow-up survey with the Canadian research administration professionals to understand if their employers have provided them with the options for preferred work arrangements, and if not, how they are adjusting to it. Furthermore, it would be valuable to investigate how the lessons learned during the pandemic are informing their current work practices, if they see some of those practices making daily work more efficient and how ultimately these practices are impacting their work-life integration.

Author's Note

Anita Sharma, Ph.D.
Manager, Research Services
The Office of the Vice-President of Research
Thompson Rivers University, Kamloops, BC.
805 TRU Way, ARA 218
Kamloops, BC, Canada V2C 0C8
Telephone: 1-(778)-471-8439
Email: ansharma@tru.ca

Correspondence concerning this article should be addressed to Anita Sharma, Manager, Research Service, The Office of the Vice-President of Research, Thompson Rivers University, 805 TRU Way, Kamloops, BC, Canada, V2C 0C8, ansharma@tru.ca.

References

AbuJarour, S., Ajjan, H., Fedorowicz, J., & Owens, D. (2021). How working from home during COVID-19 affects academic productivity. *Communications of the Association for Information Systems, 48*, 55–64. https://doi.org/10.17705/1cais.04808

Akioka, K., & Caban, T. (2020a, August 13). Adjusting to a new normal in research administration: We'd love to hear from you [Blog post]. *SRAI News*. Retrieved July 24, 2022, from https://www.srainternational.org/blogs/srai-news/2020/08/13/adjusting-to-a-new-normal-in-research-administrati

Akioka, K., & Caban, T. (2020b, September 12). The results are in: COVID Remote Work Survey wrap-up [Blog post]. *SRAI News*. Retrieved July 24, 2022, from https://www.srainternational.org/blogs/srai-news/2020/12/09/the-results-are-in-covid-remote-work-survey-wrap-u

Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological symptoms in modern offices. *Journal of Psychosomatic Research, 43*(1), 35–42. https://doi.org/10.1016/s0022-3999(97)00083-4

Awada, M., Lucas, G., Becerik-Gerber, B., & Roll, S. (2021). Working from home during the COVID-19 pandemic: Impact on office worker productivity and work experience. *Work, 69*(4), 1171–1189. https://doi.org/10.3233/wor-210301

Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Addison-Wesley.

Brynjolfsson, E., & Hitt, L. M. (2000). Beyond computation: Information technology, organizational transformation, and business performance. *Journal of Economic Perspectives, 14*(4), 23–48. https://doi.org/10.1257/jep.14.4.23

Cañada College. (n.d.). *Grants development and management toolkit*. Retrieved June 18, 2022, from https://canadacollege.edu/grants/toolkit.php

Chu, A. M., Chan, T. W., & So, M. K. (2022). Learning from work-from-home issues during the COVID-19 pandemic: Balance speaks louder than words. *PLOS ONE, 17*(1). https://doi.org/10.1371/journal.pone.0261969

Clark, G., & Sharma, A. (2022, May 31). *Research development in Canada* [Conference presentation]. Canadian Association of Research Administrators Conference, Ottawa, May 29-June 1, 2022.

Costan, L. E. (2019, August 1). *An analysis of the relationship between workplace factors and work-life balance for research administrators* [Master's thesis, John Hopkins University]. JScholarship Home. https://jscholarship.library.jhu.edu/handle/1774.2/63569

Eurofound. (2020, October 21). *Living, working, and COVID-19.* Publications Office of the European Union, Luxembourg. Retrieved July 24, 2022, from https://op.europa.eu/en/publication-detail/-/publication/3803fd7a-141b-11eb-b57e-01aa75ed71a1/language-en

Denis, J. S. (2020, April 19). Nearly 5 million more Canadians are working from home, and many like it: Surveys. CTV News, British Columbia. Retrieved July 24, 2022, from https://bc.ctvnews.ca/nearly-5-million-more-canadians-are-working-from-home-and-many-like-it-surveys-1.4903045

Desilver, D. (2020). Working from home was a luxury for the relatively affluent before the coronavirus - Not anymore. *World Economic Forum.* Retrieved July 24, 2022, from https://www.weforum.org/agenda/2020/03/working-from-home-coronavirus-workers-future-of-work/

Donati, S., Viola, G., Toscano, F., & Zappalà, S. (2021). Not all remote workers are similar: Technology acceptance, remote work beliefs, and well-being of remote workers during the second wave of the COVID-19 pandemic. *International Journal of Environmental Research and Public Health, 18*(22), 12095. https://doi.org/10.3390/ijerph182212095

Grants.gov. (n.d.). Grants 101. Retrieved July 24, 2022, from *https://www.grants.gov/web/grants/learn-grants/grants-101.html*

Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., & Toscano, F. (2021). Work from home during the COVID-19 outbreak. *Journal of Occupational & Environmental Medicine, 63*(7). https://doi.org/10.1097/jom.0000000000002236

Glasgow, S., & Sang, K. (2016). Chapter 8: Gender and work-life balance. In N. Arshed, J. McFarlane, & R. MacIntosh (Eds.), *Enterprise and its business environment* (pp. 135–150). Oxford: Goodfellow Publishers. http://dx.doi.org/10.23912/978-1-910158-78-4-2915

Konradt, U., Hertel, G., & Schmook, R. (2003). Quality of management by objectives, task-related stressors, and non-task-related stressors as predictors of stress and job satisfaction among teleworkers. *European Journal of Work and Organizational Psychology, 12*(1), 61–79. https://doi.org/10.1080/13594320344000020

Lauer, M. (2020, July 28). U.S. Department of Health and Human Services. An early look at applications submitted during the pandemic. National Institutes of Health. Retrieved June 18, 2022, from https://nexus.od.nih.gov/all/2020/07/28/an-early-look-at-applications-submitted-during-the-pandemic/

Marcoulides, G. A. (1989). Measuring computer anxiety: The Computer Anxiety Scale. *Educational and Psychological Measurement, 49*(3), 733–739. https://doi.org/10.1177/001316448904900328

Morikawa, M. (2021). Work-from-home productivity during the COVID-19 pandemic: Evidence from Japan. *Economic Inquiry, 60*(2), 508–527. https://doi.org/10.1111/ecin.13056

Niebuhr, F., Borle, P., Börner-Zobel, F., & Voelter-Mahlknecht, S. (2022). Healthy and happy working from home? Effects of working from home on employee health and job satisfaction. *International Journal of Environmental Research and Public Health, 19*(3), 1122. https://doi.org/10.3390/ijerph19031122

NSERC. (2020, April 22). *Latest news: NSERC program information in relation to COVID-19 (updated June 20, 2022).* Natural Science and Engineering Research Council. Retrieved August 1, 2022, from https://www.nserc-crsng.gc.ca/Media-Media/NewsDetail-DetailNouvelles_eng.asp?ID=1139

OECD. (2021, September 21). Teleworking in the COVID-19 pandemic: Trends and prospects. *OECD Policy Responses to Coronavirus.* Retrieved July 24, 2022, from https://www.oecd.org/digital/ieconomy/teleworking-in-the-covid-19-pandemic-trends-and-prospects.htm

Prabhakaran, A., & Mishra, H. K. (2012). Technological change in libraries: The evolution of technostress. *Researcher World: Journal of Arts, Science & Commerce, 3*(1), 131–135.

Preuss, M., Eck, K., Fechner, M., & Walker, L. (2020). Research development and its workforce: An evidence-based compendium for higher education and other environments. *International Journal on Studies in Education, 2*(1), 1–25. https://doi.org/10.46328/ijonse.12

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research, 19*(4), 417–433. https://doi.org/10.1287/isre.1070.0165

Ruzungunde, V. S., & Zhou, S. (2021). Work-life balance in the face of COVID-19: The gendered impact. *Gender and Behaviour*, 19, 18098.

Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology, 48*(3), 422–436. https://doi.org/10.1080/00207594.2012.680460

Saleem, F., Malik, M. I., Qureshi, S. S., Farid, M. F., & Qamar, S. (2021). Technostress and employee performance nexus during COVID-19: Training and creative self-efficacy as moderators. *Frontiers in Psychology, 12*, 1–16. https://doi.org/10.3389/fpsyg.2021.595119

Schade, H. M., Digutsch, J., Kleinsorge, T., & Fan, Y. (2021). Having to work from home: Basic needs, well-being, and motivation. *International Journal of Environmental Research and Public Health, 18*(10), 5149. https://doi.org/10.3390/ijerph18105149

Shambrook, J. (2012). Comparison of stress-related factors in the 2007 and 2010 Research Administrator Stress Perception Surveys (RASPerS). *Journal of Research Administration, 43*(2), 107.

Sharma, A. (2021, May 10). *Research administration in the new norm: Impact of COVID-19* [Conference presentation]. Canadian Association of Research Administrators Conference, Virtual, May 8-12, 2021.

Sharma, N., & Vaish, H. (2020). Impact of COVID-19 on mental health and physical load on women professionals: An online cross-sectional survey. *Health Care for Women International, 41*(11-12), 1255–1272. https://doi.org/10.1080/07399332.2020.182544

SSHRC. (2020, June 4). I*ncreased support for students, trainees, and research support personnel funded through SSHRC Research Grants*. Social Sciences and Humanities Research Council. Retrieved August 1, 2022, from https://www.sshrc-crsh.gc.ca/news_room-salle_de_presse/latest_news-nouvelles_recentes/2020/ indirect_supplements-supplements_indirects-eng.aspx

Statistics Canada. (2021, April 1). Study: Working from home: Productivity and preferences. The Daily. Retrieved July 24, 2022, from https://www150.statcan.gc.ca/n1/daily-quotidien/210401/dq210401b-eng.htm

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems, 24*(1), 301–328. http://www.jstor.org/stable/40398890

Tu, Q., Tarafdar, M., Ragu-Nathan, T. S., & Ragu-Nathan, B. S. (2008). Improving end-user satisfaction through techno-stress prevention: Some empirical evidence. *AIS Electronic Library*. CORE. Retrieved July 24, 2022, from https://core.ac.uk/display/301341999

Umishio, W., Kagi, N., Asaoka, R., Hayashi, M., Sawachi, T., & Ueno, T. (2021). Work productivity in the office and at home during the COVID-19 pandemic: A cross-sectional analysis of office workers in Japan. I*ndoor Air, 32*(1). https://doi.org/10.1111/ina.12913

Van Steenbergen, E. F., van der Ven, C., Peeters, M. C., & Taris, T. W. (2017). Transitioning towards new ways of working: Do job demands, job resources, burnout, and engagement change? P*sychological Reports, 121*(4), 736–766. https://doi.org/10.1177/0033294117740134

Wang, B., Liu, Y., Qian, J., & Parker, S. K. (2020). Achieving effective remote working during the COVID-19 pandemic: A work design perspective. *Applied Psychology, 70*(1), 16–59. https://doi.org/10.1111/apps.12290

Xiao, Y., Becerik-Gerber, B., Lucas, G., & Roll, S. C. (2020). Impacts of working from home during the COVID-19 pandemic on the physical and mental well-being of office workstation users. *Journal of Occupational & Environmental Medicine, 63*(3), 181–190. https://doi.org/10.1097/jom.0000000000002097

Appendix

Survey Questionnaire:

1. Organization type
    a. University
    b. College
    c. Research Institute
    d. Hospital
    e. Other

2. Type of work
    a. Pre-Award
    b. Post-Award
    c. Both Pre/Post-Award

3. Area of work
    a. Central Office
    b. Office Embedded in Department
    c. Specialization (Procurement/Finance/Compliance etc.)

4. Years in research administration
    a. 1-5 years
    b. 6-10 years
    c. 11-20 years
    d. 20+ years

5. Are you currently working from home due to COVID-19?
    a. Yes
    b. No
    c. If not, for how long did you work remotely:

6. Prior to the COVID-19 crisis, what mode of communication did you most prefer?
    a. In-person
    b. Email
    c. Phone
    d. Video
    e. Instant messaging

7. During the COVID-19 crisis and remotely working, what mode of communication do you most prefer?
    a. Email
    b. Phone
    c. Video
    d. Instant messaging

8. Prior to the COVID-19 crisis, on average how many hours a week did you spend in meetings via the following modes?
    a. In-person: _____ # of hours
    b. Teleconference: _____ # of hours
    c. Video conference: _____ # of hours

9. While remotely working on average how many hours a week do you spend in virtual meetings via the following modes?
    a. Telephone conferencing: _____ # of hours
    b. Video conferencing: _____ # of hours
    c. Instant messaging: _____ # of hours
    d. Other: _____; _____ # of hours

10. Technostress: stress caused by using Information and Communication Technology (ICT) Technology Overload may include using new and different communication application platforms and/or new online portals. Did you feel frustrated and distressed due to technology overload?
    a. Yes
    b. No
    c. Did not impact
    d. Sometimes

11. Techno-invasion describes the invasive effect of ICTs in situations where employees can be reached anytime and feel the need to be constantly connected, thus blurring work-related and personal contexts. Did you find yourself in this situation?
    a. Yes
    b. No
    c. Did not impact
    d. Sometimes

12. Techno complexity describes situations where the complexity associated with ICTs leads users to feel inadequate regarding their computer skills and forces them to spend time and effort in learning and understanding ICTs. Did you find yourself in this situation?
    a. Yes
    b. No
    c. Did not impact
    d. Sometimes

13. If you felt Technostress, can you reflect on some of the ways you adapted to it?

14. Working environment: As you moved into a remote working arrangement, did you struggle with setting up appropriate ICT infrastructure and working space?

a. Yes
b. No

15. How often did you struggle with having uninterrupted internet availability and internet performance issues?
    a. Frequently
    b. Rarely
    c. Did not impact

16. Workload: If you are working from home, are you experiencing an increase in the volume of work or is it perceived because you are working from home?
    a. Yes
    b. No

17. If there is an increase in the volume of work, is there an increase in the number of pre- and/or post-grant activities?
    a. Yes-both grant activities increased
    b. No-both grant activities remained the same
    c. Only pre-grant activities increased
    d. Only post-grant activities increased
    e. Do not know

18. Work-life integration: Did any family factors impact your work productivity?
    a. Yes
    b. No

19. If Yes, please explain

_____

20. Have you experienced an increase in work efficiencies and the ability to get work done more quickly while working remotely?
    a. Yes
    b. No
    c. Does not apply

21. If you have experienced an increase/decrease in the ability to complete more work, what do you attribute that to? Please state below:

_____

22. Team synergy: Since the COVID-19 crisis, what would you say has changed (if any) in your frequency of communication and meetings within your team?
    a. I communicated with my colleagues more frequently prior to the COVID-19 crisis

      b. I communicated with my colleagues more frequently during the COVID-19 crisis

      c. No change in my frequency of communication

23. How do you feel COVID-19 has impacted your working relationships in general?
      a. I feel I am closer to my colleagues as a result of the COVID-19 crisis
      b. I feel I am more isolated from my colleagues as a result of the COVID-19 crisis
      c. I don't feel my working relationships have changed as a result of the COVID-19 crisis

24. Communicating with faculty: Since the COVID-19 crisis, what would you say has changed (if any) in your frequency of communication and meetings with faculty?
      a. I communicated with faculty more frequently prior to the COVID-19 crisis
      b. I communicated with faculty more frequently during the COVID-19 crisis
      c. No change in my frequency of communication

25. Since the COVID-19 crisis, what would you say has changed (if any) in your efficiency to provide quality service to faculty?
      a. My efficiency to provide quality service to faculty was great prior to the COVID-19 crisis
      b. My efficiency to provide quality service to faculty was great during the COVID-19 crisis
      c. No change business as usual

26. Please explain your reasoning behind your answer to Q#25.

27. How would you reflect on your adaptability to the 'new norm'
      a. I adapted to the 'new norm' easily
      b. Adaptation to the 'new norm' was a challenge

28. Do you feel your organization's response to COVID-19 was/is sufficient for your ability to continue to work as "usual"?
      a. Yes
      b. No

29. After the COVID-19 crisis subsides and you can return to work as normal, what do you anticipate will be your preferred mode of communication?
      a. In-person
      b. Email
      c. Phone
      d. Video
      e. Instant messaging

30. Given the option, how would you see future work arrangements
      a. Prefer working remotely

      b.   Prefer in-person
      c.   A mix of a. and b.

31. Please share what you have learned during this 'new norm' that might continue post-pandemic.