Supporting Research at South African Universities during the COVID-19 Crisis: Key Areas for Consideration and Critical Reflections on Responses with a Focus on Postgraduate Education

Urmilla Bob
ORCID iD: https://orcid.org/0000-0002-4256-2488

Suveshnee Munien
ORCID iD: https://orcid.org/0000-0003-1976-234X

Amanda Gumede
ORCID iD: https://orcid.org/0000-0002-3909-3852

Rivoni Gounden
ORCID iD: https://orcid.org/0000-0001-5414-223X

Abstract

Research is key to inform evidence-based practices and responses. The need for research to address the COVID-19 impacts and inform sustainable interventions has emerged as a critical component of the response to this global threat. There is also growing recognition that the current context provides both opportunities and challenges for research efforts at universities, including postgraduate education. This chapter draws on a desktop study of university responses to the COVID-19 crisis to establish how institutions are providing administrative and systems-orientated support to ensure the continuation of research, the varied research responses to the COVID-19 threat itself, and key emerging best practice approaches that are likely to change the modes and modalities of research training. Additionally, qualitative research is employed

to reflect critically on the authors' experiences (as a component of self-ethnography) from the varied perspectives of research management and leadership, supervision and being postgraduate students. Key aspects that are examined in this chapter include process and procedural changes, the capacity and ability to provide administrative support, ethical issues and protocols, financial and resource considerations (including access to funds, library materials, etc.), training support (including accessibility to supervisors and internet-based online training materials), and disciplinary-specific sensitivities (that is, different approaches and challenges in relation to lab-based, field-based and desktop based research).

Keywords: COVID-19 pandemic, postgraduate education, supervision, resource access, administrative support, South Africa

Introduction

'Business unusual' and the 'new normal' are key terminologies that have been used to describe the prevailing contexts as the world grapples to deal with the COVID-19 pandemic. Universities throughout the world have not been exempt from the widespread disruptions associated with unprecedented and sweeping changes to curb the spread of the virus associated with the physical closure of universities. Mohamedbhai (2020) states that at a time when Africa is investing substantial efforts to transform and improve higher education on the continent, there is a danger that the impact of the COVID-19 pandemic will destabilise the sector with severe consequences. The higher education sector globally is highly differentiated, and more so in South Africa, where the legacies of apartheid and persistent inequalities remain prevalent. There is general agreement that the pandemic in many ways is reinforcing and exacerbating challenges and inequalities that need to be addressed.

Understandably, given the large numbers of students in this cohort as well as the lack of preparedness to study independently and access resources, universities have tended to focus more of their energies on undergraduate students compared to postgraduate students. Particular emphasis has been on shifting to online/remote teaching, making learning materials available to students and unpacking ways to assess and evaluate student progress. Research generally and the training of postgraduate students are explicitly important to inform evidence-based practices and responses to the range of societal

challenges, including the COVID-19 pandemic, which requires the highest level of scientific investigation on the virus itself as well as its multiple impacts and responses. There is widespread consensus that science (including all disciplinary areas and fields of research, including the Humanities and Social Sciences) will play a critical role in dealing with the pandemic. The need for continued research in a variety of fields is critically important, since the COVID-19 pandemic does not mean that other challenges faced are put on hold. Supporting research (including postgraduate studies) is therefore an important aspect to consider in the wake of dealing with the unprecedented COVID-19 pandemic.

In this context, the chapter examines opportunities and challenges concerning efforts and collaboration to support postgraduate education and research in South Africa's university sector to address the disruptions associated with the COVID-19 pandemic. The methodological approach adopted primarily draws on a desktop examination of South African university responses to address postgraduate education issues. Additionally, qualitative research is employed to reflect critically on the authors' experiences (as a component of self-ethnography) from the varied perspectives of research management and leadership, supervision and being postgraduate students. Two of the authors are academics involved in postgraduate supervision and training, with one being a Dean of Research. Another two of the authors are postgraduate students who completed their master's degrees and are currently applying to continue with their doctoral studies. The next section provides a brief overview of the South African postgraduate context. This is followed by an examination of the interventions/changes discernible to support postgraduates to deal with the disruptions caused by the COVID-19 pandemic. Thereafter, reflections are undertaken in relation to key aspects including collaboration opportunities, dealing with administrative challenges, sensitivity to student differences, accessing online resources and quality of research. Finally, concluding remarks are forwarded.

The South African Postgraduate Context

The training of postgraduate students is undertaken in an environment where the National Development Plan 2020 (National Planning Commission – NPC 2013:317) summarises the higher education system as facing a number of challenges characterised by high levels of inefficiencies:

The data on the quality of university education are disturbing. South African universities are **mid-level performers** in terms of knowledge production, with **low participation**, **high attrition rates** and **insufficient capacity** to produce the required levels of skills. They are still characterised by **historical inequities and distortions**. The university sector is under considerable strain. Enrolments have almost doubled in 18 years, yet the **funding** has not kept up, resulting in **slow growth in the number of university lecturers**, **inadequate student accommodation**, **creaking university infrastructure and equipment shortages**. The number of institutions that have recently been put **under administration** is an indication of the leadership and governance challenges.

There are substantial numbers of postgraduate students at South Africa's universities. The latest available statistics indicate that in 2018, 1,085,568 students were enrolled in public higher education institutions in South Africa with only a few students (197,898) enrolled at private institutions (DHET 2020a). Of the total number of students, 61,096 (5.6% of total) and 23,650 (2.2% of total) were registered for master's and doctoral degrees, respectively. These students were mainly registered at South Africa's public universities. Additionally, DHET (2020a) indicates that the majority of the 2019 enrolments were through contact mode (63.1%), with 36.9% of students enrolled through the distance mode of learning. The COVID-19 pandemic has forced all institutions to transition to online/remote learning modes of teaching and learning, which includes supervision and support for postgraduate students.

Cloete (2016:5) asserts that 'South Africa has the most diverse and differentiated higher education system in Africa'. There are substantial differences in the system in relation to:

- Student enrolments and backgrounds, including the level of preparedness of students
- Research outputs (including the number and graduation/ throughput rates of masters and doctoral students)
- Amounts and sources of external funding
- University infrastructure and resources, including Information and Communication Technology (ICT) capacity and library resources
- The number and competencies of supervisors: For example, in the

> South African public universities, in 2018 only 48% of academics had PhDs ranging from 69.6% at the University of Pretoria to 13.2% at Walter Sisulu University (DHET 2020b).

Additionally, the majority of students in South Africa come from poor backgrounds. These inequalities within the sector and among students are reinforced by the digital divide which, as Mohamedbhai (2020) argues, has emerged as critically important, as higher education institutions across the continent have had no option but to deliver their academic programmes online. These differences are reinforced by high levels of inequalities in the system (reflective of society as a whole) and responses to the COVID-19 pandemic.

Cloete *et al*'s (2015) assessment of the progress of the 2001 cohort of master's graduates to doctoral graduates in South Africa over 12 years reveal a 'leaky pipeline'. Of the 6,613 master's students who graduated in 2011, 1,061 registered for doctoral studies within five years of completing their master's. Among this group, 417 graduated with doctoral degrees within seven years. Additionally, Cloete *et al.* (2015) show that dropout or non-completion rates differed in relation to the field of study, with the highest proportion of students graduating in the Natural and Health Sciences (53%) and the lowest proportion in Business, Economics and Management (37%). Relevant for this chapter is the proportions for Humanities and Arts (49%), Social Sciences (46%) and Education (44%). The statistics presented by Cloete *et al.* (2015) are indicative of the challenges in postgraduate supervision and differences among and within universities in South Africa.

Postgraduate studies and research outputs more generally are also extremely important sources of funding for South African universities, as noted by Styger, Van Vuuren & Hymans (2015). They assert that institutional grants allocated in relation to research outputs (including postgraduate completion) are crucial to the financial stability of South African universities that tend to rely heavily on public funding. Also, postgraduate research funding comes primarily from two sources: external (statutory funding from the National Research Foundation - NRF) and funding leveraged by supervisors. Funding for postgraduate research is often accessed on a competitive basis. Mohamedbhai (2020) warns that Africa relies heavily on international funding sources to support research (thereby supporting postgraduate education) and as countries globally enter recessions, funding is likely to be limited, which will severely impact on the types and quality of research undertaken on the continent.

Interventions/Changes Discernible to Support Postgraduate Students during the COVID-19 Pandemic Disruptions

A range of responses to deal with COVID-19 pandemic related disruptions are examined in this section. These reveal efforts by universities to attempt to address the needs of postgraduate students and provide support to both students and supervisors.

Process and Procedural Changes

Universities are looking into and have changed processes and procedures in relation to administering and supervising postgraduate students in response to the disruptions caused by the COVID-19 pandemic. Changes and relaxations that may have to be made within universities are in relation to postgraduate student admissions, progression and the awarding of degrees. For example, most universities award *cum laude* and *summa cum laude* degrees based on completing the degree in stipulated minimum times. Given that the current disruptions encountered (which are impeding data collection, interaction with supervisors and other research-related activities) are of no fault of the students, allowances need to be made to ensure that students are not unfairly disadvantaged. Rethinking timeframes for the completion of degrees is also important at universities such as the University of KwaZulu-Natal (UKZN) that has fee remission for full-time, research-based postgraduate students. Master's and doctoral students are expected to pay fees if they exceed a year and three years, respectively. These timelines need to be revised to suspend or waive semesters that have been severely disrupted by the pandemic. Student-specific research topics should also be considered, since some, as will be discussed later, can be severely impacted, while others may benefit from the lockdown, depending on the nature of the study and the stage of the research. Generic or 'one-size-fits-all' policies and procedural changes may, therefore, be highly problematic.

In relation to postgraduate research, severe disruptions were immediately felt, even prior to 27 March 2020, when the lockdown was pronounced by President Cyril Ramaphosa, and when Higher Education Minister Blade Nzimande announced on 20 March 2020 that universities needed to shut down. Lab and field-based research not directly linked to COVID-19 essential studies ceased immediately and remains compromised. Many universities communicated these decisions to supervisors and students,

even guiding them to rethink protocols for year-long research projects (such as honours and master's projects) to focus on desktop studies. The extent to which supervisors and students have adjusted to the disruptions needs further investigations. However, there has been an increase in desktop research and social science studies where data collection is confined to online surveys. This assertion is based on our experience and interactions with researchers as well as calls to participate in online surveys.

In South Africa, research ethical processes and guidelines were put together by the Research Ethics Support in COVID-19 Pandemic (RESCOP), an informal grouping of Research Ethics Chairs (RECs) from different universities. Ethics committees generally have prepared for the physical closure of universities and the national lockdown. RECs have remained committed to ensuring that, where possible, the processing and ethics approval of research protocols continue and that online administrative support is provided, as required. Universities have also informed postgraduate students and supervisors that face-to-face/physical contact (including field-based) and lab-based research is suspended except COVID-19 and other essential approved research protocols during the period of the lockdown and while social distancing requirements are in place. The suspension applies to research applications that have already been approved and the resultant impact is that for several postgraduate students, their research has prematurely ceased. At some universities, supervisors and postgraduate students have been advised by the RECs to review their methodological approaches and they reassured the research community that amendments to protocols will be processed expeditiously. Depending on how long the disruptions persist, some students may need to change their topics completely.

Most universities have also cancelled, postponed or are considering virtual graduation ceremonies, since social distancing norms negate the format of the traditional ceremonies. It is interesting to note that initially some students resisted this decision, but as the seriousness of the health crisis became evident, there is general acceptance that graduation ceremonies are highly risky. Universities have reassured students that degrees will be awarded without the ceremonial graduation event.

As will be discussed later, challenges that remain and systems that need to be improved, are related to administrative support that can ensure effective change management, as well as communication with students and supervisors.

Supervision and Postgraduate Students Training and Capacity Development

Cloete *et al.* (2015) centralise the role of the supervisor in doctoral production in South Africa to ensure growth, quality, efficiency and transformation. As indicated earlier, the South African higher education sector has serious challenges. Supervision capacity has been highlighted by King (2018) as a key factor that influences the number of students that graduate timeously (or at all) as well as the quality of the postgraduate training in the country. Mutula (2011) states that some universities in South Africa are characterised by a scarcity of research expertise, inexperienced supervisors, and supervisors working in fields that differ from their specialisations, which frustrates students and has an impact on postgraduate research outputs and quality. The quality and/ or preparedness of postgraduate students in South Africa has also been noted as an area of concern by some researchers (Cloete *et al.* 2015; Mutula 2011). The combination of underprepared students and inexperienced/ inadequately qualified supervisors pose challenges that impact on the success rates, as indicated earlier.

Thus far, insufficient attention has been paid to supervisor capacity, except to generally provide online training that focuses on the push to prepare academics to train students online. However, Mohamedbhai (2020) cautions that online delivery impacts on the quality of training, since it requires that 'teaching material is prepared by a professional instructional designer, that the lecturer is pedagogically trained for delivering the programme and the students are equally exposed to the pedagogy of online learning'. Some universities use University Capacity Development Grant (UCDP) funding to provide training to improve supervision (focusing on aspects such as good supervisory approaches/models, research ethical considerations, what constitutes master's and doctoral research, research proposal development, monitoring student progress, etc.), article writing virtual workshops and the use of quantitative and qualitative software packages. It is important to note that some are offered by teams at specific universities on a fee basis, which reflects the national need to undertake this level of training at institutions where this level of training capacity is either limited or non-existent. Additionally, universities are offering online training support directly to postgraduate students in relation to several critical areas, including proposal writing, academic/scientific writing, quantitative and qualitative software packages, etc.

Online platforms such as Zoom, Vidyo and Microsoft Teams have emerged as important virtual 'spaces' for students and supervisors to meet and interact with one another. While several universities in South Africa have shifted to online learning and reassured students that the 2020 academic year will be concluded, others have yet to start or have the majority of programmes online. For example, Khumalo (2020) reports that while several universities have proceeded with resuming their academic programme online, the University of Zululand has warned students that the 2020 academic year may go into 2021, primarily as a result of the institution needing to ramp up e-Learning provision capacity and the low online participation rate among students, because many reside in rural areas. It is also important to note that many universities in Africa generally do not have the capacity to offer all classes online, as noted by Mohamedbhai (2020). The state of readiness reflects the type of university, specifically in relation to distance learning orientation prior to the COVID-19 pandemic disruptionsrand, and whether universities were historically advantaged or disadvantaged during the apartheid era. Universities that had already embraced distance learning are proving to be more resilient and effective in dealing with the current crisis. This is understandable, since universities have the expertise and infrastructure to transition more easily to online learning. Unsurprisingly, historically advantaged universities have better infrastructure, smaller class sizes, more qualified academics and more students from historically advantaged backgrounds, which imply that more students will have the required resources (internet connectivity and laptops) for online learning.

Financial and Resource Considerations

Funding agencies and bodies have extended funding for postgraduate students and research, noting that research in many cases (especially lab and field-based research) has been placed on hold, affecting the proposed timeframes for the completion of the research. Agencies may also need to reconsider how funding can be used. For example, the NRF does not permit funding to be used to purchase laptops, but the current context makes accessibility to laptops an essential research item.

Khumalo (2020) notes that the more established and more prominent research universities such as the University of the Witwatersrand, Stellenbosch University, University of Cape Town, University of Pretoria and University of

KwaZulu-Natal were able to secure deals with big companies so that students could access data for free and create schemes to permit students to access the necessary hardware for online learning. As insiders at the universities, it needs to be noted that even the established universities are facing challenges with online learning, and not all academic programmes are online. Many students experience challenges to participate in online learning.

In the South African context, an important consideration is also that a large percentage of postgraduate students are foreign students, many of whom returned home when accommodation facilities were closed. Specifically, DHET (2020a) reports that 10,276 master's students (17% of the total master's enrolment) and 9,415 doctoral students (40% of the total doctoral enrolment) were international students, mainly from other African countries. Despite these large numbers and proportions of students, there does not appear to be institutional strategies to engage with these students in a targeted manner. Additionally, if universities open before travel restrictions are uplifted, foreign students will struggle to re-enter the country timeously.

The assumption that postgraduate students have internet connectivity, funds to acquire data and laptops is problematic in relation to many students, especially those from historically disadvantaged backgrounds. Most universities have embraced the principle of 'leave no-one behind'. If the challenges that students face are not addressed, many will be left behind. Universities are awakening to the stark reality that the prolonged disruptions will have severe impacts, and the high levels of unpredictability will result in tentative planning at best. The ethos is changing to support as many students as is practical and possible (given the infrastructural and access challenges faced) so that they can progress with their studies and have concurrent strategies to assist those who may be unable to continue with their studies. Many universities have also provided opportunities for undergraduate and postgraduate students to suspend their studies with no costs.

Financially, universities are also dealing with how to process postgraduate fees, given that many students were unable to finalise their registration prior to the disruptions, and several are unable to access resources and/or supervisors. Universities will, therefore, be ethically obliged to extend the time permitted for students to complete their degrees without additional fees. Communicating clear decisions on this matter may also assist in easing some of the stress students are likely to endure as they contemplate dealing with the financial pressures of the disruptions. Of concern also is that

postgraduate research funding is likely to shrink as resources globally shift to fight the virus and health impacts. Funding priorities will also be geared towards dealing with the direct (especially far-reaching economic) impacts of the disruptions associated with the pandemic that include severe travel restrictions (with the airline industry almost halting to a standstill), closure of businesses and increases in unemployment rates and job losses.

Reflections
Opportunities for National and International Collaboration
It is important to note that several aspects discussed above have components that reflect collaboration at different levels. For example, libraries are working closely with peers nationally and globally engaging with publishers to access academic publications at no or reduced costs.

The ethical review protocol processes for COVID-19 research and research more generally (which impact directly on postgraduate students and supervisors) reveal the collaborative potential at national and international levels. Nationally, several biomedical and social science RECs Chairs worked together informally to formulate guidelines and share best practices and documents via a support group called RESCOP referred to earlier. RESCOP aims to provide support and advice while complying with national laws, regulations and statutory guidelines. Internationally, the World Health Organisation (WHO) has worked regionally to provide guidance and ensure that research integrity is maintained at the highest levels. Specifically, WHO Africa (2020) facilitated fora for national regulatory authorities and national ethics committees from Africa to draw on expertise to expedite clinical trial reviews and approvals while respecting the independence and authority of bodies in countries to grant reviews. The collaboration in South Africa has extended to the humanities and social science research as well.

WHO Africa (2020) comments that the impacts of the COVID-19 pandemic have revealed the complexity of biomedical research, which can extend to all types of research as well, including research in the humanities and social sciences. This, WHO Africa (2020) asserts, requires increased cooperation between different partners and stakeholders, including ethics committees, researchers, donors and governmental regulators. While several challenges are experienced, opportunities exist for exciting and multidisci-plinary research that postgraduates can benefit from, given that there is

consensus that the pandemic affects every aspect of life. Thus, different disciplinary and methodological lenses are required to unpack the multitude of impacts and guide evidence-based interventions and strategies. Furthermore, new types of research skills may be needed, and the postgraduate sector needs to respond appropriately to train a new generation of research to respond to the current situation and ensure that the future world is pandemic resilient.

COVID-19 is not the first pandemic that the world has experienced. Key lessons from the 1917-1918 Spanish Flu pandemic, which coincided with World War I is that political decisions and lack of coordinated efforts aggravated the reach and impacts of the disease (Cotter 2020). Furthermore, Cotter (2020) raises an important lesson that armed conflict substantially undermined efforts to deal with the Flu. South African universities need to pay attention to this aspect as the sector has been hamstrung by protests in the last few years. If they restart, it will be a serious challenge for universities that are already financially strained and are struggling to ensure that academic programmes continue. It is therefore imperative that political decisions that impact on universities are done in consultation with the higher education sector and that institutions collaborate with one another to share experiences, lessons and resources.

Dealing with Administrative Challenges

The unprecedented and unpredictable environment in which people live and work while we come to terms with dealing with the COVID-19 pandemic, requires flexibility and learning by trial and error. However, for students, this can be confusing if communication is non-existent or ineffective. Students (and academics) often receive communication detailing decisions taken rather than being provided with the background and contextual information that informed the decision. This often leads to miscommunication and tensions between institutional leaders, administrators and managers, academics/supervisors and students. There needs to be proper administrative and quality assurance processes (including monitoring the supervision process) that support postgraduate students throughout the different stages of completing their studies which include application, registration, proposal formulation, ethical approval, data collection and write-up, submission for examination and graduation.

The automated email notifications that have become the norm state

that responses will be delayed, since staff are working from home and will respond when they can, are very frustrating for students who are seeking information on several issues including:

- The status of their registration;
- How to contact their supervisor/s;
- How to access their funding (many are bursary recipients who are experiencing challenges in relation to their funding to be released); and
- How to access resources.

Universities are gearing to ramp up training; yet a neglected aspect seems to be training administrators on how to provide the much-needed support for academics and postgraduate students.

The challenges experienced in managing and administering students during this time reveal that universities have failed to develop and implement online postgraduate management systems. Thus, a positive outcome is likely to be more effective administration systems that are user-friendly for students who do not need to be at universities physically.

Lack of Consideration of the Different Academic Stages and Contexts of a Student

Universities seem to be still struggling to communicate with postgraduate students in relation to the different cohorts they belong to in terms of their stage of progression, disciplinary background, geographical location and socio-economic backgrounds. It is important to note that not all disciplines can shift the methodological approaches adopted to online data collection approaches or desktop studies. This is particularly relevant for the physical, biological and environmental sciences where field-based and/or lab-based research is a necessity. Sufficient consideration has also not been given to the costs incurred by many postgraduate students who had to abandon their studies that were already underway as a result of not being able to access labs and/or complete field-based research.

For doctoral students who have to demonstrate expertise in their area of research, critically engage with the field of research, and contribute to the body of research in a specific field; undertaking research in isolation will be

particularly challenging. The need for discipline-specific online research spaces is therefore important to establish.

Students have also expressed concerns with the widespread assumption that if one has internet connectivity, a computer and access to a supervisor; then postgraduate research can proceed. There is also the expectation that this can be an ideal time for students to write. This may be the case for students who are still conceptualising their research, focusing on the literature review and/or are in their final stages of writing, having concluded collecting their data. Additionally, students undertaking desktop research or are able to shift this type of research, are likely to have fewer disruptions with their studies if they have access to the hardware, software and their supervisor. However, a key issue is that insufficient attention is paid to the living environments where students reside. These environments may not be conducive to postgraduate students to be research productive. Isolation from other students and academics is also not conducive to postgraduate studies where peer-to-peer learning opportunities are vital to think through ideas and get feedback from the broader research community. While postgraduate students have supervisor/s, students do rarely not interact with other academics and peers to guide their research thinking. Universities may need to pay attention to the mentoring as well as supervision needs of postgraduate students.

It is also worth noting that there has generally been silence among universities on how to support and address the needs of students with disabilities during this time. The shift to online learning will further disadvantage visually impaired and deaf students. There should be an increased focus on developing support systems for these students. Ndlovu (2020) notes that students with disabilities face various obstacles at postgraduate level in South Africa, specifically inadequate supervision. This is likely to worsen considerably during this period of severe disruptions, since access to supervisors will be even more limited during the current conditions.

Accessing and Using Online Resources, Including the Internet

The discussion in the previous section highlights the importance of accessing the internet for online meetings, training and sourcing resources. The extent to which universities appear to have been in vastly different states of readiness to use online platforms or understand that different types of online resources are

available for online training is surprising. Having been involved in postgraduate training (as facilitators and beneficiaries of such training), caution should be exercised when evaluating the impacts of online training on postgraduate students and supervisors. Unlike at the undergraduate level, where there is a greater level of content focus, at postgraduate level the focus shifts substantially to higher-level critical thinking and sensitivity to discipline/field specificities, which tend to be undermined when generic training is offered. As Mutula (2011:184) states, 'the emphasis of postgraduate research is on developing systematic skills of investigation in the research process'. Thus, as online training becomes a common approach to engage with postgraduate students, greater attention should be paid to the type of information disseminated, as well as the sizes of the number of students participating in the training, and who undertakes the training.

Knowing who is undertaking the training is extremely important to shift from content training on how to write a proposal, how to use statistical packages, how to write academically, etc. to include the why, so that higher-level critical thinking and reflection required at a postgraduate level can be fostered. This requires experts/established researchers from various disciplines who are excellent facilitators in using online training platforms. As noted earlier, a positive impact of the COVID-19 pandemic on higher education is the increased levels of cooperation and collaboration among university leadership to address broader issues such as access to library resources and research ethics processes. It is imperative that spaces are created for increased collaboration at disciplinary/research area levels to go beyond joint research projects that have been effective in attracting national and international funding as well as informal networks, to more formal structures facilitated by the universities to offer training to groups of postgraduate students at different levels and targeting specific disciplines. This will also assist in addressing the supervision capacity challenges that some institutions face in relation to specific disciplines. Virtual platforms do break physical barriers as well as reduce costs associated with travel and venue hire when face-to-face national training workshops are held.

Online resources have become a major source of information for the public in general and students in particular, from school learners to doctoral students. While some academics are aware of the freely available online resources to support their students, many academics are not aware of resources available to assist their postgraduate students. Google search immediately

brings up a range of tutorials, videos, presentations, etc. by experts in the field and students which cover aspects from writing a research proposal to addressing feedback from reviewers when submitting an article for publication. Additionally, several companies/organisations (such as Web of Science, etc.) are making resources freely available as part of their efforts to support universities and the research community during these difficult times. They are also providing webinars and information to assist researchers with useful online searches for academic resources. Many universities globally are also offering free online training, including certificate programmes. There are also useful software packages such as Grammarly, Scrivener, Ref-N-Write and ProWritingAId that have been acquired by some institutions, as well as several that are freely available that help students to write academically. Universities in South Africa should inform postgraduate students and academics of these opportunities and online resources available more effectively.

It is also important to inform students about how to access online resources effectively. The existence of online materials and resources as well as internet connectivity do not mean that postgraduate students can access them. As Jeyshanka, Nachiappan and Lavanya's (2018) study of postgraduate students in Tamil Nadu, India (where students display similar characteristics to the majority of students in South Africa) reveal, differences were noted in relation to information retrieval skills and the use of electronic resources. They assert that students' efforts to use electronic (and online) resources may be limited, due to a lack of skills. Navigating through the myriad of online resources available in the information explosion age can be a daunting task for many postgraduate students. Jeyshanka *et al.* (2018) indicate that being able to find relevant and appropriate information is a skill on its own and demonstrates a researcher's ability to undertake independent research. The importance of library staff to provide training and assistance to postgraduate students becomes essential, again reinforcing that many postgraduate students need interaction and support external to that of their supervisors.

Quality of Research

Several issues emerge in relation to the quality of research which are important to consider since they affect the skill levels of the graduates as well as the value and impact of the research undertaken. The shift to online surveys is understandable, but the reliance on this approach is highly problematic to

examine trends in a country such as South Africa. Who responds to the online surveys depend highly on the existence and quality of internet connectivity, which is not easily accessible to the general populace. Thus, the representativeness of the results can be compromised and can seriously undermine the reliability and validity of the research undertaken. As Grewenig *et al.* (2018) state, online surveys exclude the 'offline' population. Furthermore, online surveys are by their very nature self-completion surveys, and therefore the researcher has limited, if any, opportunities to clarify misinterpretation of questions or probe further if need be, which can be done when face-to-face interviews are conducted (Zhang *et al.* 2017).

Postgraduate training, as indicated earlier, focuses primarily on higher level research skills training that is often imparted by actually doing. In several disciplines, many of these skills are highly technical, and training takes place using the apprenticeship model, as noted by Mutula (2011). The disruptions have severely curtailed this type of training, and as is the case with the online teaching of practical's, different learning approaches and materials need to be developed.

There has been significant focus on assessing and evaluating undergraduate students' performance in virtual settings. Assessing postgraduate progress and examining dissertations and theses produced under conditions imposed to deal with the COVID-19 pandemic also needs rethinking.

Conclusion
The pandemic has certainly exposed that most universities (and certainly academics) are entrenched in traditional modes of engaging with postgraduate students and are struggling to provide them with the supervision they need under the current circumstances. While universities have indicated their desire to create more conducive research environments for postgraduate students, the COVID-19 pandemic has placed a spotlight on the range of challenges faced to support postgraduate students, forcing us to re-examine what constitutes research spaces and environments, especially in the context of virtual engagement. While not the focus of this chapter, there is also a need to provide career and psychological counselling support for postgraduate students who are likely to grapple with a range of anxieties dealing with their academic progress, stress associated with the disruptions, and job prospects when they

complete their studies if not currently employed in a secure job. As Hillman (2020) asserts, a post-coronavirus recession could drive higher education demand and enrolment as job prospects decline and take time to recover from the current worldwide trends of job losses and increased unemployment. Graduates are unlikely to secure jobs in this environment and are likely to opt to continue with their studies, placing increasing pressure on an already overburdened postgraduate education environment in South Africa. This will increase the stress experienced by graduates, especially those who have just completed their degrees and planned to enter the workforce. Hillman (2020) argues that previous research on graduate cohorts post the 2008-2009 economic recession shows that these graduates faced higher unemployment rates and lower pay decades after the recession. This pandemic-induced recession is by far the worst the world has ever seen.

The discussion clearly shows that there are numerous responses to address the postgraduate education challenges faced by the COVID-19 pandemic. What is also evident that best practices are emerging, especially in relation to collaboration efforts to share resources and experiences as well as provide guidelines. Different modes and modalities of research training and supervision approaches are also evident. As a 'new normal' emerges, there is no doubt that the world and higher education landscape will change. While traditional modes of postgraduate training and supervision will return, and the alternative approaches that gained prominence in response to support postgraduate students are likely to be retained. This will be particularly important in the South African context, where many universities have regularly closed due to student protests. Online options will permit teaching, learning and research supervision to continue despite disruptions.

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Prof. Urmilla Bob
Professor of Geography
School of Agriculture, Earth and Environmental Sciences, and
University Dean of Research
University of KwaZulu-Natal
bobu@ukzn.ac.za

Rivoni Gounden
Masters Graduate
Geography and Environmental Science
College of Agriculture, Engineering and Science
University of KwaZulu-Natal
goundenr@ukzn.ac.za

Amanda Gumede
Masters Graduate
Geography and Environmental Science
College of Agriculture, Engineering and Science
University of KwaZulu-Natal
gumedea1@ukzn.ac.za

Dr. Suveshnee Munien
Lecturer in Geography and Environmental Science
College of Agriculture, Engineering and Science
University of KwaZulu-Natal
munien@ukzn.ac.za