THE CHALLENGES AND OPPORTUNITIES EXPERIENCED DURING COVID-19 INFORM RESHAPING OF TEACHING, LEARNING AND RESEARCH PRACTICES FOR A SUBGROUP OF FPP PARTICIPANTS

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ABSTRACT

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and subsequent coronavirus disease 2019 (COVID-19) had widespread disruptive consequences on various sectors including tertiary education. Universities were shut down and forced to introduce emergency remote teaching and learning. This coincided with the period where the authors of this article started

advanced professorial training through the Future Professors Programme Phase 2, Cohort 1 (FPP). Like other educators, the authors experienced COVID-19-linked challenges and opportunities and decided to report on this through a review of the literature and reflective writing.

While most publications between 2020 and now focused on the challenges and opportunities caused by the pandemic within the teaching and learning environment, challenges and opportunities experienced in the research environment were less reported on. Often, the findings presented also focused on one discipline or in single institutions. This meant that the responses to address pandemic-associated disruptions would be limited in its view and weighted to teaching and learning and specific discipline(s).

Set against the background of the South African higher education (HE) system, the authors review how COVID-19 augmented existing challenges as well as how it presented opportunities for improved teaching, learning and research. This is done by providing context to the challenges and opportunities of not only teaching and learning but of the research environment whilst focusing on several disciplines and institutions.

While there is an overlap in the COVID-19 experience within the five Institutions (UCT, UWC, UJ, NWU and TUT) in terms of challenges and opportunities, the impact on research was as devastating as it was on teaching and learning with unique scenarios applicable to the respective disciplines/institutions. The supplemental FPP training and teachings placed the authors in a unique position compared to our peers, in our approach to dealing with the academic disruption. While the pandemic had a general negative outlook for most academics, the FPPs programme better prepared the authors to reimagine and reshape our teaching, learning and research practices to face future pandemics.

Keywords: teaching, learning, research, COVID-19, Future Professors Programme, higher education, South Africa

INTRODUCTION

During 2020 the coronavirus disease 2019 (COVID-19), spread by a highly infectious severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was subsequently declared a pandemic (WHO declares COVID-19 as a pandemic). COVID-19 caused global disruptions in higher education, and South African universities were not spared in this regard. The restriction on movement during the lockdown in South Africa (SA) from 27th March 2020 to December 2022 meant that there would be no gatherings and no travel. No gatherings meant no contact classes at higher education institutions (HEIs). Educators taught from home and took on new work practices (Iwu et al. 2022) guided by revised human resource policies.

The phenomenon of a pandemic was new, it brought on added workloads, stress, anxiety, and uncertainty, all of which negatively impacted academic productivity, more especially that of early- to mid-career researchers (Iwu et al. 2022). Prior to the pandemic, "*education in emergencies*" in law were previously defined to include countries experiencing armed conflict, natural disasters and refugees living in camps (Landa, Zhou, and Marongwe 2021) but as of

2020 the unique COVID-19 pandemic has also been added to the list. COVID-19, besides the physical and socio-economic impact, affected individuals' mental health, well-being and sense of security (Landa et al. 2021) which led to increased awareness and support for mental health services in higher education. The pandemic meant that graduation schedules would have to be revised, thus affecting subsequent placements of graduates and their associated responsibilities.

Despite being on the path to incorporate more of the blended learning model pre-COVID, the majority of HEIs had contact classes (Mpungose 2020; Gumede and Badriparsad 2022; Iwu et al. 2022). Since COVID-19 institutions had to quickly adapt to emergency remote and online teaching. While some institutions had implemented online teaching (via platforms such as Zoom, Blackboard, GoogleMeet and MS Teams) to circumvent class disruptions synonymous with our HE system (Landa et al. 2021), some educators lacked the necessary skills and were still being trained to facilitate digital teaching (Sonn et al. 2021). Then, for some institutions that already had the technology in place, it was simply not being used because of a lack of technical readiness (Siddiquei and Kathpal 2021). In addition, South African Universities were experiencing student protests, many of which were centred around insufficient funding, and financial and academic exclusions, which had now become a common occurrence at the beginning of each academic year. Some protests became violent which prompted university closures. Consequently, the 2020 academic year had not started for some institutions that were now instructed to close due to COVID-19 (Landa et al. 2021).

According to the International Association of Universities global impact survey, the African region had the highest percentage of HEIs that closed during the pandemic whilst configuring the transition of online learning (https://www.iau-aiu.net/IAU-Global-Survey-on-the-Impact-of-COVID-19-on-Higher-Education-around-the). While more than 60 per cent of HEIs in developed countries quickly transitioned to online teaching, only a few institutions (less than 30 per cent) could do so in Africa (Sonn et al. 2021). Many universities were experiencing pre-existing financial crises; grappling with the increased expense linked to enforcing health and safety measures and experiencing reduced funding from government and other sources (Le Grange 2020). At this point COVID-19 exacerbated the social divide between poor and affluent HEIs creating a phenomenon termed "uberfication of university education" which demanded the use of online learning tools to guarantee academic success tools many scholars lacked access to (Le Grange 2020). According to Motala and Menon (2020), this lack of access further entrenched exclusion creating barriers to teaching and learning. While a transition to new technological learning strategies aligns with the requirements of academia, it poses challenges for students from poor backgrounds who lack electronic devices, knowledge exposure, and infrastructure to cope with online learning approaches and resources (Makole 2023). We

elaborate further on some of these aspects, below.

The factors which hampered access to education in SA pre-COVID and even post-COVID include for example, scholars living in remote areas who fail to access education due to socio-economic status and lack of devices. Should they have such devices, it is often incompatible with the applications they are expected to use. Where travel was possible (when lockdown levels were reduced), the students were be confronted with lack of transport to reach HEIs as travel by train or air were still not operational in most provinces. In many settings, there is inadequate water and electricity supply, unstable communications technology infrastructure/network connectivity. The home environments of many students are not conducive to studying in terms of family relations and physical space. For more context to these factors, the reader is referred to exemplary studies (Landa et al. 2021; Gumede and Badriparsad 2022; Mpungose 2020; Sonn et al. 2021).

Taken together, the SA HE system has unique factors which disrupt access to education – In this article the status of the HE system in SA (pre-during and post COVID-19) and the initiatives set forth by the government to address the disparities are reviewed. The objectives of the FPP are summarised. The authors review the literature on COVID's role in exacerbating existing challenges as well as how it presented opportunities for adopting improved teaching, learning and research practices through FPPs training. While our focus is on SA, many of the circumstances presented are reflective of other developing countries (see for example, Siddiquei and Kathpal 2021; Izhar, Al-dheleai, and Si Na 2021).

LITERATURE REVIEW

Current status of HE in SA and initiatives driving its change, pre- and post-COVID-19

The Department of Higher Education and Training (DHET) has been actively engaged in transforming the demographic profile of staff at public universities. The objective being to obtain a staff equity profile in line with our national demography (Breetzke and Hedding 2018). To achieve this, work must be done to increase the number of qualified Black male and female staff and individuals with disabilities at HEIs. Data reported in DHET's working group of 2018 showed an increased trend in Black and female staffing since 1994 (post democratic elections) although African and Coloured males and females remained underrepresented in the university system with Whites dominating. Just under 50 per cent of staff had doctoral degrees. This was increasing but at a very slow pace. Of the staff with doctoral degrees, females and non-Whites represented less than 20 per cent, respectively. The South African professoriate comprised only

14.6 per cent of the African pool of which the majority was >55 years of age and dominated by males (Annexure G Workstream 4 Report). According to Breetzke and Hedding (2018) the gap between White and Black academics is set to narrow between 2020–2025 (Breetzke and Hedding 2018) mainly due to government initiatives and the soon-to-be retiring cohort of White professors. With COVID-19 causing the deaths of both young and old during its peak, this may have impacted predicted trajectories and necessitates a re-evaluation of the demographic profile.

There is a fine balance between rectifying the educational inequalities brought on by apartheid and filling these positions in order to meet transformation and equity targets versus employing those who are undeniably qualified in terms of merit. Such concerns are evident in Bitzer's article on status inflation at SA's HEIs and the risk of a questionable professoriate if such titles are not awarded based on academic merit (Bitzer 2008). To ensure that capacity and the quality thereof increases within our university systems, the DHET through its University Capacity Development Programme (UCDP) and "Staffing South African Universities" Framework (SSAUF) implemented several capacity development programmes. These programmes are aimed at curriculum development, ensuring student throughput, and tailoring qualified professors. The Nurturing Emerging Scholars Programme (NESP) for example aims to recruit and retain Black African postgraduate scholars who have an interest in academia while the New Generation of Academics Programme (nGAP) recruits junior academics whose disciplines are in need at institutions whilst considering equity targets. The University Staff Doctoral Programme (USDP) aims to support staff registered for doctoral degrees while the Higher Education Leadership and Management (HELMP) is directed at training leaders and managers at different levels within universities. The Existing Academics Capacity Enhancement Programme (EACEP) aims to support Black academics already in the university system (Breetzke and Hedding 2018). Of interest to this article is the Future Professors Programme (FPP) which we form a part of.

The Future Professors Programme

FPP is a collaborative initiative hosted by DHET and 26 South African universities. The program's primary goal is to bolster the capabilities of the lecturer, the senior lecturer equivalent staff and to cultivate a new cadre of professors. The program facilitates the readiness of promising academics to contribute to the development of a critical mass of academic excellence with an intention to transform diverse disciplines at South African universities and respond to the shifting needs of society at large. This is achieved through cross-disciplinary and inter-university peer networks. Structured seminars and interactive workshops facilitate in-

depth discussions and training related to various aspects of academia and professorial roles. The platform allows the participants to evaluate their current capabilities, identifying areas for improvement and further development through academic advisors, coaching and mentoring. The personal, academic and leadership skills of each cohort member are thus tailored and ensured. The FPP promotes international engagement, potentially through collaborations with universities and academics from other countries, fostering a global perspective and knowledge exchange. Since the inception of our cohort during 2021 which finally comprised of 28 delegates, there have been 17 promotions in total to senior lecturer, associate professor and full professor which speaks to the effectiveness and value of the FPP. Of these promoted, 53 per cent and 35 per cent represent Black females and males, respectively thus the FPP is actively contributing to reshaping the staffing profile in our higher education system. The FPP is expected to continue its mission with an emphasis on innovation, inclusivity, and international collaborations. The program will adapt to the changing educational landscapes and foster diversity within the professoriate. Its continued evolution and adaptation to future challenges will enable it to shape the educational landscape beyond 2050 (https://fpp2.co.za/). However, it is crucial to stop and reflect on how unexpected world events could inadvertently impact the mission of growing this professoriate. The challenges brought by COVID-19 impacted teaching, learning and research especially for this cohort of FPP2 who navigating these challenges at the beginning of their FPP programme.

Challenges reported during COVID-19

Teaching and Learning

Several HEIs across SA are based in what are termed small academic towns. Here, scholars and educators who make up the population are primarily from out of town. The pandemic saw many of these individuals leave return to their family. While this released these individuals of their rent/leasing commitments it had other implications. In the case of students, this meant that many returned home where they were without the necessary infrastructure to engage in online teaching. In response, many of the Universities in SA sent laptops, data, mailed hard copy material etc to ensure access to education. This had cost implications and was difficult where incorrect contact details were supplied by scholars to the various HEIs. Similarly, educators battled with internet access and in some instances did not own the required devices or had to share these with their children who were also scholars thus complicating teaching from home (Sonn et al. 2021). Scholars were also disadvantaged by curriculum changes which required technologies they could not access/afford.

Educators were aware of the shift to blended teaching and learning pre-COVID-19 but were still in training. As a result, many educators were not fully equipped to teach in the digital era. Various learning management systems (LMS) and online learning programs were in existence across universities but were not used as much prior to COVID-19 (Hodges, Moore, and Lockee 2020). Scholars too, were informed of applications/tools that they were going to use as part of the blended learning process. They were never formally introduced to these, nor the resources needed to support their use (Gumede and Badriparsad 2022). Scholars had to learn to use the application/tools and then had to learn the content (keep in mind the hindrances already experienced prior to the pandemic) (Landa et al. 2021).

One of the biggest challenges in facilitating continued education was the assumption that because individuals own devices, they are tech-literate (Izhar et al. 2021). As previously mentioned, COVID-19 equally affected scholars and educators in SA (Landa et al. 2021) and elsewhere (Izhar et al. 2021). Online migration requires that both parties be supported (Iwu et al. 2022; Stankovska, Imran, and Grncaroska 2022). There was an increased expectation of support from staff who were developing and hosting the resources needed by scholars and educators. Various emergency short courses were developed by Centres for Teaching and Learning (CTL), and everyone was trained on these. Centres for teaching and learning at various institutions were instrumental in this regard although constant training and communications sometimes left one anxious and more confused.

Where educators previously planned for contact sessions, the material now had to be developed for an online format, adding more of an administrative load on educators. In Law faculties and other disciplines, the inquiry-based learning model was typically used in the classroom. Inquiry-based learning is an “array of classroom practices” that promote student learning through guided and, increasingly, independent investigation of complex questions and problems, often for which there is no single answer (Snowden 2004). With the shift to online, there was pressure to make the content more condensed but understandable and relatable. These aspects were not unique to SA, see for example Izhar et al. (2021).

When online systems went live these were overloaded and sometimes crashed, placing an administrative load on the educator yet again. Assessments had to be changed to suit an online format, this meant more open-book assessments. Given the network connectivity issues and load shedding in SA, online assessments remained open for longer to accommodate the load-shedding schedules and varying home contexts of scholars across the country. Keeping assessments open for longer allowed room for academic dishonesty. The challenge was left to the educators to ensure the integrity and quality check of their assessments. Similar to the report of Stankovska et al. (2022), many institutions were also subject to postponing assessments

while configuring the best assessment formats and revising assessment plans. While some LMS allowed for feedback in the form of comments, availing of full memorandums, etc, marking, and providing feedback to students was challenging. Landa et al. (2021) also reports on this aspect. Feedback was not always immediate and was often misunderstood. Given the pandemic environment, educators were empathetic which meant a greater than usual degree of leniency during marking. This and being unable to observe the body language of scholars meant that assessing scholar learning was not easy or accurate nor was it very objective.

Data from post-COVID years suggests online assessments have disadvantaged scholars. In fact, several academics challenged University management committees regarding the favourable outcomes they report COVID-19 to seemingly have had on education (Gumede and Badriparsad 2022).

Although LMS allowed for the deposition of resources and for scholars and educators to communicate alike, albeit via text, students still felt they wanted to see a face on the other end. Educators were again tasked with having to arrange additional Zoom/Google Meet/MS Teams sessions, adding to their administrative load, and infringing on their personal time. This highlighted the need for integration of LMS with conferencing applications. Delivering classes in a synchronized manner was difficult, especially in cases where students were dispersed across the country and internet access was not guaranteed. Students were generally encouraged to attend online classes, but it was also understandable if this was not possible for every student, so educators would often record material being covered in a synchronized class and deposit it on a common LMS which allowed students to engage with the material at a later time point. In the case of the educator, the additional sessions brought on fatigue and exhaustion having to be available to panicked scholars 24/7. Many educators felt burnt out but thankfully also realized the need to keep to office hours and maintain work-life boundaries (Iwu et al. 2022). Because some educators intentionally dumped content without availing themselves to scholars, this resulted in a lack of teacher-student engagement. Where classes were hosted online, scholars were also shy to engage. Students felt isolated, and lonely, and tended to work by themselves.

In this digital era, students engage less with text and more with visual content. As such some students lack critical skills to read, comprehend, assess, and argue. A lot of the material and messages posted on LMS are not read or are misunderstood (Matarirano et al. 2021). According to a study that focused on 125 students in one of the historically disadvantaged HEIs in South Africa, found that ability to enjoy LMS like Blackboard was associated with computer literacy, computer self-efficacy while computer anxiety had a negative effect (Matarirano et al. 2021). This shows a need to educate both learners and educators on these LMS for better engagement with material and usefulness of the platforms.

If one considers indigenous knowledge systems (IKS), it allows opportunities for intergenerational and, at times, multilingual learning which was limited by the introduction of technological tools. Most if not all these tools are based on one language, less personal and interactive, which could negatively impact those students who would have benefitted from multilingualism often practised in class. As such, there was a cultural disconnect with the rapid transition to online teaching and learning for students in an unequal society such as SA. The shift to digital platforms presented a challenge to preserving and transmitting knowledge, particularly in various indigenous languages (Landa et al. 2021).

With the immediate lockdown in effect, we can recall instances where us as educators wanted to refer to hard copy material such as books which was left at the office but could not be accessed. Educators then spent additional time searching for alternative teaching open access sources that would be just as applicable as the original resource intended for use.

Research

The COVID-19 pandemic brought about challenges in research of which some could not have been predicted and anticipated. The majority of research came to a halt whether it was social science, laboratory or hospital-based research. One of the measures that was brought in as a major public health policy was social distancing which meant that close contact to research participants was not possible. Even laboratory-based research required that personal protective equipment had to be worn at all times and reasonable social distancing measures taken into consideration. Many institutions opted to close all research activities that required researchers to travel to campus or interact with participants as this would increase the risk of transmission of the virus. Not all impacts of COVID-19 were negative, Riccaboni and Verginer (2022) have analysed other positive impacts in research. While research papers in areas not related to COVID-19 saw a significant drop, papers that focused on COVID-19-related research saw a massive 6.8-fold increase. This was true for research funding and clinical trials. Major funders and government institutions pivoted their financial budgets towards the COVID-19 research emergency fund, which enabled research on vaccines, therapeutics and clinical trials (Tuttle 2020). The social impact on patients was unimaginable, a lot of people missed cancer diagnosis, and chronic medication delivery was also negatively impacted which resulted in increase in cases of undiagnosed infectious and non-infectious diseases due to laboratory closures for non-essential services. In the South African context, this led to an increase in undiagnosed tuberculosis cases and a surge in diseases (McQuaid et al. 2020).

At the beginning of the lockdown in March 2020, research stalled across the world, and many researchers in South African Universities were negatively impacted by the pandemic.

Funding in some cases was suspended or those who had received funding already could not use this funding due to not being able to conduct research. Several international research funding bodies withdrew funding, especially for developing countries in order to consolidate their own resources to better prepare for the pandemic (Nwako et al. 2023). Students could not start or complete their research projects leading to significant delays in graduations and completions. For lab-based researchers who rely on global reagent shipments, this was not possible and meant that even when lockdown levels were lifted it was still not possible to conduct research. All of this led to loss of productivity for many researchers. This was felt even more for researchers at an early career or mid-career stage, who would have relied on publishing their findings and acquiring grants and conducting research which enables upward movement in academic careers. Some of these challenges are summarised in Table 1.

Table 1: Table showing the challenges experienced by academics in their teaching and learning as well as research environments as per their discipline

Challenge(s)	Teaching and Learning environment	Research environment	Discipline	Reference
Network connectivity	✓	×	Education Education	(Landa, Zhou, and Marongwe 2021)
Online teaching infrastructure for staff	✓	×	All disciplines	
Learning management systems	✓	×	All disciplines	(Matarirano et al. 2021)
Staff burnout	✓	✓	All disciplines	(Iwu et al. 2022)
Grant funding cuts		✓	All disciplines	(Tuttle 2020)
Research halted		✓	Life sciences mainly	(Tuttle 2020; Riccaboni and Verginer 2022)

Opportunities reported during COVID-19

Teaching and Learning

The pandemic allowed for unique partnering between government and private entities to help deliver education to all (e.g., zero-rated apps and zero-rated university websites) (Sonn et al. 2021; Landa et al. 2021). The pandemic also allowed opportunities for online engagement through collaborative online international learning (COIL) which allowed educational and cultural exchange of ideas across continents (Rubin 2000). Many universities are now part of this COIL initiative which gives students an opportunity for international experience, creates awareness and knowledge about other cultures, and increases cross-cultural collaborations.

Professor Jonathan Jansen's publication on what scholarly teaching should look like

states: “Scholarly teaching is rich, deep, engaging, transparent, interactive and committed” (Jansen n.d.). It references acts of teaching against what is known in the literature, on the one hand, and what can be observed from best practice, on the other hand. It is “intellectually intensive in the planning and teaching phases of preparation, but it is also personal and engaging with the students who are present” (Mutemi and Murote 2020).

The FPP stressed the importance of including IKS into the curriculum. This is in response to the South African IKS Policy as an enabling framework aimed at stimulating and strengthening the contribution of indigenous knowledge (Kgope 2023). Indigenous knowledge is understood as local knowledge unique to a given culture attained by local people through shared experiences, informal experiments, and an intimate understanding of the environment in a specific given culture (Kgope 2023). Indigenous knowledge systems emphasize the importance of indigenous wisdom, practices, and worldviews in shaping educational experiences and offer a valuable framework for understanding these dynamics.

Research

Since the technologies for teaching, learning and communication were employed globally in response to the pandemic (especially the rise of Zoom and MS Teams), colleagues were more accessible allowing easier collaboration and exchange of information and data via these platforms (Guzmán and Larrain 2021). Online communication platforms thus fostered international collaborations through virtual conferences, joint research projects, and student exchange programs. The lockdown also forced academics in various disciplines to engage with various online materials available through the university channels.

While shifts in consumer behaviour, health and safety concerns, and changes in travel regulations transformed the tourism industry, the pandemic accelerated the digital transformation of the travel industry (Vukile Mlungisi Mkhonza, Pearl, and Sifolo 2021). There were opportunities to explore the impact of technology on traveller behaviour, such as the rise of contactless transactions, the use of mobile applications for travel information, and the role of virtual experiences. Post-COVID, research placed a significant emphasis on health and safety considerations and therefore allows for the exploration of traveller perceptions of safety measures, the influence of health-related factors on destination choices, and the role of technology in ensuring a safe travel experience. Post COVID-19, researchers are focusing on the resilience of the travel and tourism sector and the promotion of sustainable practices (Traskevich and Fontanari 2023). Others are paying attention to the growing trend of digital nomads. According to Hannonen (2020) the term “digital nomad” describes a category of mobile professionals, who perform their work remotely from anywhere in the world, utilizing

digital technologies, while "digital nomadism" refers to the lifestyle that is developed by these highly mobile location-independent professionals. Remote work influences travel decisions and has altered expectations regarding the overall travel experience. COVID-19 exacerbated the use of the word "digital nomad", even though it was developed in the 1980s'. Some of the opportunities are summarised in Table 2.

Table 2: Summaries of the opportunities presented by COVID-19 to academics in teaching and learning as well as research environments and lists of the applicable discipline reporting on such

Opportunities		Discipline	Reference
Teaching and Learning environment	**Research environment**		
Collaborative online international learning (COIL)		All disciplines	(Rubin 2000)
Indigenous knowledge systems	Indigenous knowledge systems	All disciplines	(Kgope 2023)
	Digital nomads	Tourisms	(Hannonen 2020)
Government and private entity collaborations (zero-rated apps)		All disciplines	(Sonn et al. 2021; Landa, Zhou, and Marongwe 2021)

Problem, aim and objective

As seen from the literature above and the summaries presented in Tables 1 and 2, respectively; while most publications focused on the challenges and opportunities caused by the pandemic within the teaching and learning environment, those experienced in the research environment were less reported on. Often, the findings presented also focused on one discipline/institution. This meant that the responses to address pandemic-associated disruptions would be more bias and weighted to teaching and learning and a specific discipline(s). To address this gap, the authors reviewed COVID-19 and existing challenges and its presentation of opportunities for improved guiding of educational practices by highlighting not only those experiences in the teaching and learning environment but that in the research environment as well while focusing on several disciplines and institutions.

RESEARCH METHODOLOGY

The scope of the study was focused on HEIs in SA however, the authors reviewed publications from other institutions outside of South Africa to–show the commonality between the experiences of low- to middle-income countries (LMIC) and that COVID-19 was global and non-discriminatory in its reach. The approach taken was exploratory and followed a qualitative research design. This approach is ideal for gaining a deeper understanding of the lived experiences of the Future Professors Programme Phase 2 participants from various disciplines i.e., Law, Science and Travel and Tourism. A purposive sampling technique was used to select

participants from three distinct disciplines. This was to ensure a diverse range of perspectives across different academic fields. Reflections of the participants' experiences are explored regarding the changes in teaching methods and challenges faced during the pandemic, the impact of COVID-19 on student learning and engagement as well as the adjustments made to research activities and collaborations. Moreover, the perceived impact of online learning platforms and resources and the long-term implications of the pandemic on teaching and learning, research and community engagement in South African universities are presented. Thematic analysis was used to analyse the recurring themes across the literature and narratives to understand the participants' shared experiences and perspectives. Accuracy in capturing the lived experiences of Future Professors Programme Phase 2 participants from various disciplines in South African universities was critical. Reflexive journal and dialogue to document own assumptions and learnings throughout the research process were considered.

RESULTS AND DISCUSSION

A review of the literature showed many institutions responded similarly, sending out regular communication about the pandemic, changes in pandemic alert levels and what those changes meant for HEIs. Many new terminologies were used as part of the communication (Landa et al. 2021) which at times caused more confusion and panic. Thinking back, several challenges confronted the teaching, learning and research space, many of these overlapping in terms of it being experienced across disciplines, institutions and countries. We highlight these as well as instances unique to our SA context and/or discipline.

Challenges identified by the FPPs during COVID-19

Teaching and learning

In the literature the slow shift to blended learning was highlighted. In the case of Law modules taught by two educators at different institutions, class sizes ranged between 400 to 650 students. Prior to the pandemic technological engagements for example only served to supplement select subject matter through including lectures from the United Nations Audio Visual Library and blog posts – mostly to provoke the interest of students who may wish to pursue a Masters (LLM) in International Law. The pandemic prompted educators to use University LMS to be able to communicate with learners. The Law educators subsequently resorted to "Full online practices". This is defined as a situation in which face-to-face lectures, without prior planning and preparation, are replaced by online facilitation of learning (instruction) exclusively. Initial responses by the Law educators included 45–50-minute audio and/or video lectures made to

mimic face-to-face teaching. These recordings were often accompanied by skeleton notes and uploaded onto the University's LMS. The posting of the recordings was very heavy on data and did not retain student attention. For one of the modules, the Law educator used the messaging functions within the University's LMS to direct scholars to recordings that were also shared via WhatsApp thus reducing the burden of data. Online quizzes showed that without class participation these videos were not an effective teaching tool. Revisiting the LMS statistics revealed that students did not complete the lessons. In one instance, an academic developer at the Department of Teaching Innovation was consulted to revisit the offering of the online program which included reconsidering the target audience. This would help understand contextual conditions and interactional dynamics. Generation Z was identified as the target audience (Juaneé Cilliers 2017). Generation Z, is a generally accepted description of the generation born between 1995 and 2010 (Juaneé Cilliers 2017). Understanding how Generation Z best processes information, i.e., how these "digital natives" learn (Mohr, Mohr, and Mohr 2017) was critical in improving emergency remote teaching. All these changes and considerations left educators feeling overwhelmed. As reported by others, educators while implementing online teaching, had to learn to use and navigate the LMS and then how to deliver the content (Landa et al. 2021). If the delivery was not effective, this impacted scholar engagement and interest.

In the tourism industry, remote and virtual research methods (online surveys, virtual interviews, and social media analysis) deprived researchers of observing the body language and facial expressions where participants could not show their faces in the focus group.

We highlight the issue of less text and more graphics using the findings of one Law module again where Generation Z was identified as the target audience. This generation is considered to be technologically savvy and highly connected generation who can quickly access a wealth of information on their smartphones (Maimela 2022; Mohr et al. 2017; Juaneé Cilliers 2017). Generation Z functions in a world where reality and the virtual world are blurred. These scholars have a short attention span and struggle to sift through and sort out what is pertinent and useful in the ocean of information at their fingertips (Mohr et al. 2017). In response, teaching content was chunked. PowToon's (no more than 3 minutes), partially and fully animated videos (no more than 12 minutes) and podcasts (no more than 10 minutes) were rolled out. PowToon's are short yet stimulating videos in the cartoon format which is a perfect match for the learning style of Generation Z and an effective tool for their long-term memory retention. Merging generational theory and cognitive load theory informed this decision. Cognitive load theory supports that the storage of information in long-term memory requires the processing of information from sensory memory into working memory (Brame 2016). The capacity of

working memory is limited, and it is therefore critical that the working memory receives signals or cues to indicate which information it should receive, process and commit to long-term memory (Brame 2016). Short videos respond to the capacity of limited cognitive load and facilitate long-term memory retention (Brame 2016). The quizzes and subsequent assessments proved these tools to be reaching the target audience and enhancing their learning experience (Brame 2016).

With respect to language for example, some of the travel and tourism facilitators teaching Entrepreneurship through gamification and roleplaying found it difficult to teach on digital platforms due to the technological and multilingual disparities observed. Lack of access to technological resources and language barriers thus hindered deep engagement.

Research

For those in the life sciences, the travel bans and limited flights meant supply chain interruptions which meant reagents and consumables could not be delivered or its delivery was delayed. This hindered project deliverables and had funding implications. A lot of the reagents, consumables and protective wear needed by researchers were being used in laboratories to study various models linked to COVID-19 (Tuttle 2020). As such these resources were not available to scientists engaged in other projects as it was in high demand in hospitals and other healthcare facilities caring for SARS-CoV2-infected patients and research institutes conducting COVID-19 research. The high demand and now scarcity of resources routinely used to conduct experiments with, resulted in escalated prices. Large conferences that usually showcase the latest teaching and research trends, increase the visibility of one's work to others in the field and favour networking and establishing collaborations, did not happen. Cancellation of training, meetings, conferences, and exhibitions affected many small micro, medium enterprises (SMME) sectors such as tourism, automotive, and real estate (Vukile M. Mkhonza and Sifolo 2022), and non-food retail and transport sectors.

In some universities, all research involving animals was suspended and all breeding of animals stopped. In some of laboratories where students and staff were able to support COVID-19-related research, these laboratories were re-opened 3 months into the pandemic to assist with the overburden of testing and validating protocols and surveillance.

The negative impact of COVID-19 on research funding, especially international funding, cannot be underestimated. Major research funders who had made commitments to fund researchers, particularly in LMIC abruptly cut funding and those who did not cut funding gave a no-cost extension to already existing funds. This was devastating as salaries needed to be paid even though no work could be performed. Research involving human participants had to be

suspended or redesigned to incorporate COVID-19 to commence under the new regulations, which allowed COVID-19-related research to continue. The impact on grant holders was immense and impacted their ability to complete already funded projects.

In terms of wet laboratory experiments for postgraduate students, the majority of laboratories were closed, and all activities had to be discontinued at least for the highest levels of restrictions. The pandemic thus prevented researchers from accessing labs (Guzmán and Larrain 2021), and projects could not continue, as a result, there were no hands to do the work, projects were delayed (Sonn et al. 2021) and their associated outcomes were impacted (funding, graduations etc).

For the undergraduate practicals of the Life Sciences laboratories, the services of camera and film crews, multimedia and instructional designers were sourced to assist with converting wet lab demonstrations to a digital format. Lectures and practicals were pre-recorded as were demonstrations of actual practicals. Some of the practicals were adapted so that students could do these at home using daily household items while video recording themselves and explaining what they were doing and the principles thereof. Translating the information to a digital format meant time had to be directed to achieve this, time not initially planned for. Here the lack of tech-readiness of students and their failure to read instructions, came to the fore again, evident by panicked queries about compressing the size of files, where and how to upload files etc.

When more was known about how to minimize the spread of the virus, safety officers at research laboratories for example did risk assessments, evaluating the number of allowable people in a laboratory depending on its size. Postgraduate scholars were then allowed to work on a rotational basis. In some universities, applications were developed to monitor rotational work, booking of equipment and rooms and entry and exit of people in research institutions. When smaller numbers could return to the workplace or HEIs, scholars in their final year of study were prioritized (Sonn et al. 2021). Graduations and the completion of research papers were severely impacted by COVID-19 as some scholars were at the critical stage of finalizing their research projects or thesis. This meant that the quality of the thesis was not of the expected standard and that many examiners understood this as everyone was dealing with a “new” global phenomenon. This also meant that editors and reviewers had to accept that some experiments not critical for the manuscripts, were not performed which allowed research papers to be published.

In the life and health sciences, IKS came to the fore as multiple countries were faced with COVID-19 with no way of managing it initially. There were many speculations on how to best treat it with many countries trying to find ways to remain operational at least within their boundaries. Several traditional medicines were reported to have antiviral effects, although these

were difficult to judge objectively at the time as there were limited epidemiological studies that could be performed to test the veracity of those interventions. With that being said, it was interesting to draw correlations between countries that had low death rates and the use of traditional medicines (WHO COVID-19 16 Nov 2023). A traditional plant which was made famous by Chinese scientists in 2018 because of its effects against Malaria, re-emerged during the pandemic across the global South where it is used by indigenous people to treat various ailments. In SA, it is known as uMhlonyana, and was largely reported as an intervention at least amongst rural parts of the country where more than 70 per cent of the population rely on traditional medicine as the first intervention in primary care.

It is noted that legal research is largely desk-top based. Before the pandemic, access to hard copies of law research material and that of other disciplines was quite easy. Visits to the university libraries to access the latest case laws, legislations, international treaties, and journal articles among other material was very possible. Assistance by the librarian who was also the "go to" person when certain material could not be accessed, was quite convenient. When the pandemic started, access to the library was restricted and a reliance was placed on online sources to access law and other reading material (University of Pretoria Department of Library Services Notice). Even though the library might have been open, access into the university was limited to those who were vaccinated. There were also academics who were against vaccination, and this led to them not being able to visit the university library and other facilities, in person. Librarians had ensured that the licenses to the latest online material were up to date (University of Pretoria Department of Library Services Notice). Any delays in this regard would have seriously impacted upon the finalization of research-based articles. Even though it was possible to make use of libraries outside of the universities, the pandemic restrictions had limited this option as well.

In the social sciences, especially in the travel and tourism industry, a lot of research benefited from a stable and predictable industry environment. For example, the trends and patterns were more consistent, allowing for longitudinal studies and robust data analysis. The research was centred around topics related to industry growth, expanding markets, and emerging travel trends. Pre-COVID-19 researchers relied heavily on traditional data collection methods, including surveys, interviews, and historical data analysis. At that time the research was focused on understanding consumer preferences, destination choices, and factors influencing travel decisions. COVID-19 disrupted these data collection strategies which now had to take on an online format. During and post-COVID-19, the research focus shifted and now necessitated an understanding of how the industry adapted to COVID-19 associated challenges. Research focused on crisis management among **S**MMEs was done, particularly the

tourism business, with a specific focus on travel agencies. Since the travel and tourism industry was closed, students could not do their practicals nor participate in work integrated learning as there were fewer companies willing to provide experiential learning to students.

Opportunities identified by the FPPs during COVID-19

Teaching and Learning

As much as the COVID-19 pandemic plagued the academic environment with challenges it also presented with various opportunities. No travel meant saving on travel expenses, less time spent commuting and ultimately being more present at home which had implications for maintaining a work-life balance (Iwu et al. 2022).

How teaching took place, changed. Ultimately, the pandemic prompted investments in infrastructure that would enable communication with family, friends, and colleagues through other means. The pandemic accelerated particularly the adoption of technology in education, pushing institutions to invest in online learning platforms and infrastructure to ensure continued access to quality education. The online mode of teaching meant that a greater degree of accountability and responsibility would be on the scholar to make it through the academic year. As such more scholarly-centred learning versus educator-centred teaching took place. Resources were always available to scholars and if they did not quite understand a concept, could revisit the recording or online material. Studies were thus happening at the pace of the learner and study schedules were thus more flexible. In having to make the content more condensed but understandable and relatable, this allowed room for educators to be creative, innovative and to co-create. This included the use of previously mentioned audio recordings, video messaging of difficult concepts, additional cartoon video content, use of video content journals such as JoVE, which all were aimed at making content understandable. Online teaching and learning may arguably also have presented opportunities for digital inclusivity because institutions had to train everyone from staff members to students, whilst ensuring equitable access to online learning resources. It also allowed cross-cultural collaboration between indigenous and non-indigenous academics whilst fostering knowledge exchange and enriching the learning experience and research. Working and studying from home allowed for flexibility in terms of how one utilized one's time (e.g. scholars could assimilate information at a time that suited them versus being confined to a timetable and hour when they were not physically and mentally prepared to absorb such information). Most of the content had to be compressed and adapted for zero-rated websites or platforms, which allowed scholars to use minimal data.

For many of our HEIs, the scholars are the link between education and educating their

immediate households and communities on various phenomena/concepts. In the wake of the pandemic, scholars could help change how we manage the pandemic (Sonn et al. 2021). Unique community engagement opportunities to educate individuals about the pandemic while still maintaining distancing arose. A pilot study investigated the usefulness of an open educational game in teaching individuals about infectious diseases (Liebenberg et al 2022) before the launch of the official game (http://www.infectionfighters.co.za/index.html). Here the authors showed that open educational games are an effective resource which can help increase knowledge about health and health misinformation, the response to health crises and its management.

Research

South Africa has prominent scientists, renowned in the infectious diseases field, who guided our government in making informed decisions regarding minimizing and managing the spread of COVID-19. In fact, our scientists were amongst the first to sequence and identify some of the most important SARS-CoV-2 variants (De Oliveira 2022). The work of these individuals strengthened our fight against COVID-19 and as such reinforced the credibility of HEIs and research institutes across the country. It increased the level of trust in our researchers (Guzmán and Larrain 2021; Sonn et al. 2021) and hopefully served as a foundation that sparked the renewed interest of our youth in the Science, Technology, Engineering, and Math (STEM) field.

While COVID-19 brought on numerous global challenges and opportunities, the FPP journey reminded the FPP participants to embrace our roots and refocus our teaching, learning and research on Africa. Inspired by the prompt of the FPP to offer regional voices to regional problems, research projects were indeed re-focussed. For example, in the forthcoming edited volume, (Bradley and Svicevic 2024) "*Mozambique's Cabo Delgado Conflict: International Humanitarian Law and Regional Security*" was imagined, edited and completed with Martha M. Bradley as co-editor. This edited volume is a response to the teachings of the FPP to embrace regional dilemmas as future professors and to not steer away from a multidisciplinary approach. The volume offers a broad range of exclusively African perspectives, the book addresses issues related to the ongoing conflict in Mozambique employing a multidisciplinary approach (Bradley and Svicevic 2024). Another example in this regard would be the status of the application of Islamic law of inheritance within the South African legal context. Muneer Abduroaf has increased his research focus on this and has to date completed eight journal articles (some already published whilst others have been accepted for publication) during his time spent as an FPP participant. These articles include a broad spectrum of focus areas of a recent Constitutional court judgment impacting all South African Muslims, issues concerning the application of Islamic law of inheritance in South Africa via wills, how existing inheritance

legislation impacts South African Muslims, the effect of a relevant South African case on the application of an Islamic will in South Africa, Islamic divorces within the South African legal context, and others (Abduroaf 2022).

Reflecting on the definition of scholarly teaching by Prof Jansen, this informed the law lecturers' approach to redesigning their lecture offerings post-pandemic. Indeed, the virtual offerings remain advantageous for memory retention and to reach the cohort who forms part of Generation Z however there is still a need to personally engage with students which cannot be fabricated virtually. Indeed, there is still a place for face-to-face learning, but a hybrid approach should be followed. A hybrid approach refers to a mixed model where technology and face-to-face methods are combined (Hodges et al. 2020).

Post-pandemic teaching was indeed informed by lessons learned from the emergency remote teaching (ERT) experience. One Law lecturer uses the chunked virtual lectures that are now used in the pre-class phase to ensure that students have a foundation before attending classes. Students also are encouraged to complete quizzes prior to class. Contact classes or face-to-face classes are used to consider the application of theory to real-world scenarios through the inquiry-based learning model or the dialogical model. Having a pre-class phase and an in-class phase improved the discussions. This hybrid approach also accounts for the reality that students learn in different ways. Similarly, Dr Muneer Abduroaf has applied a similar approach to his post-pandemic teaching style. The audio recordings remained useful with regard to parts of the work that are very technical in nature. The students then had the advantage of listening to the recordings and making notes concerning questions that they may have thought of while listening to the recordings. The contact classes were thus more productive as the engagement with the lecturer was limited to parts of the work that were still unclear to the students after having listened to the recordings and having read the relevant law material. This model worked just as well for the other disciplines represented in this article.

At the University of Johannesburg, International Humanitarian Law (IHL) is taught as part of the LLM International Law module. IKS was employed during 2023 to transform and promote a more inclusive curriculum. IHL finds application to a situation once an armed conflict exists. It serves to regulate the conduct of parties to an armed conflict (Bradley and Svicevic 2024). The focus of concern is not only the conduct of hostilities but also the alleviation of suffering during an armed conflict. The International Committee of the Red Cross (ICRC) is universally recognised as the "custodian" of IHL. The mandate of the ICRC includes promoting awareness of this area of law and its content, disseminating knowledge of IHL and preparing any development of IHL. Since 1954 the ICRC has advocated the importance of engaging with the humanitarian values of a variety of cultures (ICRC Workshop Geneva 29–

30 October 2018). The ICRC has responded by initiating a research project exploring a synergy between traditional African customs and IHL. The result is the creation of the "Tool on African Traditions and the Preservation of Humanity during War" (ICRC Workshop Geneva 29–30 October 2018). Mabeza and Bolus explain that "the Tool illustrates how a collection of African traditions correlate with modern-day principles of IHL, presented in various formats that can be used for both pedagogical and operational outreach" (ICRC Workshop Geneva 29–30 October 2018). There is a dedicated lecture in the curriculum on the African Tool presented by the ICRC. This African Tool is furthermore incorporated into the curriculum as a whole – to highlight the synergies between indigenous knowledge and IHL.

In teaching and learning, the pandemic also served as a springboard to launch courses that would integrate IKS with Western medicine teachings. In one University, a new course that deals with pathogens and how they are treated, incorporated lectures and a practical component of IKS, where students are exposed to traditional medicinal plants via an excursion to a famous botanical garden at the foot of Table Mountain. Such content and practical components reinforce the idea that different cultures practice medicine in different ways and that in some cultures there is a multigenerational flow of indigenous knowledge that continues to influence day-to-day practices in treatment and primary care. Some select personal experiences are summarised in Table 3, along with how it informed change for each of us at our HEIs.

COVID-19 informed reshaping of teaching, learning and research practices by a subgroup of FPP participants

Exposure to the FPP firstly allowed for dialogue and for reflection on how things are currently done versus what is lacking and what we reimagine our HEIs to be beyond 2050. In answering this the take-home messages have been numerous, but we reflect on key ones shaping our daily practices. Educators should not be set in formal, boring traditional ways of teaching where there is heavy reliance on the educator. Educators should be fluid, where the learning process is scholar-cantered with the educator constantly adapting teaching styles and assessment types based on the cohort. Educators are to embrace what it is to "unlearn how we've practiced before", "rethink" and "reimagine" the future!!! This is especially true in the context of Collaborative Online International Learning (COIL) which we have all been subject to as a result of COVID-19 despite its advantages and disadvantages.

The FPP sessions enlightened one about the various tools, some new (4IR-focused e.g., artificial intelligence) while others have been at our disposal but can be repurposed (e.g., storytelling) in order to make teaching, learning and research fun so that information is not only

retained but understood to the point of application. We have found a renewed appreciation for ridiculous ideas and questions as well as "embracing crazy" especially within the classroom whether in-person or online for these are where agents of change stem from. Also, in embracing the tools/technologies we are more aware of ensuring inclusive education. These will find much use, especially in the life sciences for conveying those difficult-to-explain concepts and analysing complex datasets. By engaging in talks about the National Research Foundation's (NRF) rating system, collaborations, applying for grants etc we got to see how crucial it is to rethink and focus on that one research question you want to address as this will allow for you to occupy a niche area in your field which will draw potential collaborators. Many of the authors have revisited our primary research questions and long-term research plans.

The program has awakened us to the importance of designing and responding to the needs of our society from templates applicable to our African context. This awareness has one constantly thinking about reviewing how to localize educational material, modify the curriculum, modify our LMS, incorporate IKS and consider the South African learner context. The leadership components helped to learn more about ourselves as well as the individuals we encounter in our work life to help navigate the various personalities better to enable a healthy and productive work environment. This is being applied especially to the supervision of postgraduate students and relationships with colleagues.

The program has made us more aware of the importance of understanding the internal processes and strategic plans of our institutions for setting in motion our career advancement plans. Equipping academics for the role of professor requires various support structures and resources. For some of us, it has really made us question the academic rank of a professorship and what it means in a South African context and globally. With us growing into more senior ranks and knowing just how much value programs such as the FPP add, we will in the future strongly encourage such initiatives early on in support of other emerging scientists because a well-trained academic will deliver exceptional graduates who will ultimately grow into these senior positions and become world leaders, repeating this cycle of producing excellent ethical and grounded professoriate.

Finally, the FPP has helped us reimagine a higher education system beyond 2050 that is not limited nor is it confined to space, currencies in use and by age but one which embraces constant change, diversity, and inclusivity. These aspects we have more consciously considered in our practices and have slowly begun to implement.

Table 3: Key COVID-19-associated challenges and opportunities considered by a subgroup of FPP participants for reshaping current teaching, learning and research practices in their respective disciplines

Challenged and Opportunities	Law	Science	Travel and Tourism
Key Challenges Teaching and Learning	Facilitating inquiry based on learning and case discussions through ERT	Lack of hands-on practical experience Maintaining student engagement in ERT	Institutions faced a decline in the number of students participating in travel-related courses, internships, and field studies. Reduced industry demand affected career prospects, job placement rates, and the overall employability of graduates.
Key Challenges Research	Access to primary sources not available online	Travel ban, laboratories shut, lack of reagents, unexpected cut in research funding with implications for graduation, job placements and household responsibilities	Abrupt change in data collection methodologies Technological disparities observed
Key Opportunities Teaching and Learning	Rethinking how we teach law going from traditional face-to-face to hybrid	Collaborative Online International Learning (COIL), blended courses with wider outreach nationally, Online assessments	Embracing virtual simulations, online experiences, and data analytics in teaching enriched the learning experience.
Key Opportunities Research	Embracing and researching legal aspects of pandemics	Global webinars, more virtual connections, leading to collaborations Showcasing South African researchers to the world	Collaborative research projects, joint programs, and knowledge exchange initiatives allowed institutions to leverage global expertise
Shaping current practices	Being fluid educators who embrace scholar-centred education and the 4th Industrial Revolution, which may include repurposing existing tools for teaching, learning and research. Integrated learning where students lead and shape their learning through guidance. Building future leaders with a strong research focus, that embrace diversity, inclusivity and “crazy”. Work from an African context with an improved understanding of self and one’s peers to allow for productive working environments. Aligning one’s teaching and research to the strategic plans of one’s institution while supporting training initiatives of emerging academics.		
HE beyond 2050	The role of AI in teaching, learning and research should be streamlined and harnessed. It should be considered how AI could be employed as a learning tool and a research tool to advance different fields. We should constantly work toward a higher education system that is not limited/restricted.		

CONCLUSION

Disruptions such as the COVID-19 pandemic lead to challenges but also opportunities which may inform positive changes in the HE system. This study is limited by its focus on a specific cohort of future professors. The findings may not be generalizable to the broader population of South African university faculty.

This exploratory study can pave the way for further research. Future studies could involve

quantitative methods to survey a wider range of faculty members which form part of development programs such as the FPP versus faculty without the additional training.

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