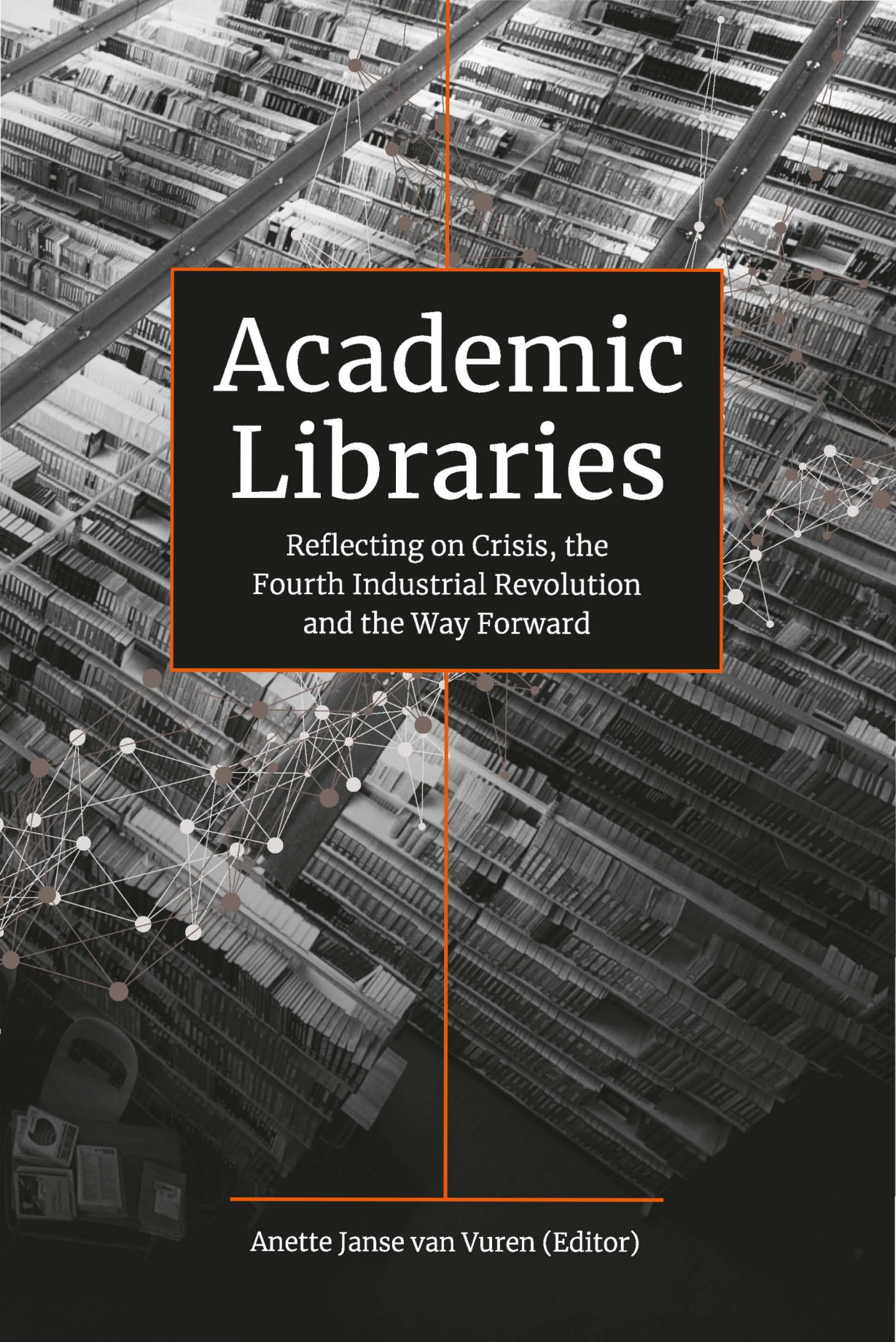

Academic Libraries

Reflecting on Crisis, the Fourth Industrial Revolution and the Way Forward

Anette Janse van Vuren (Editor)


UNIVERSITY
OF
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Preface

Anette Janse van Vuren

Editor

The academic library has for many years been at the heart of universities and by and large managed to develop in tandem with their parent institutions. They have always had an essential role in supporting teaching and learning at higher education institutions. However, since the 1960s, there has also been constant predictions that libraries will become redundant and lately, that they will be changed beyond all recognition. None of these predictions about irrelevance has come true, as libraries, and especially academic libraries, have had to change and adapt to new circumstances and especially new technologies at an ever-increasing rate. The fast rate of change and development started with the digital age or the Third Industrial Revolution and is currently culminating in the disruptive wake of the Fourth Industrial Revolution (4IR), fuelled by the even more disruptive impact of the COVID-19 pandemic.

The University of Johannesburg (UJ) is actively engaging with the challenges and opportunities inherent in the 4IR, and in 2018 the UJ Library embarked on a series of international conferences on this topic to facilitate discussion between academic libraries.

The 2019 conference, **The Fourth Industrial Revolution and Library Practices**, explored the role of academic libraries and how they needed to adapt to the advent of a new era of industrial development, based on interconnectivity and smart automation.

Towards the end of 2019, the COVID-19 pandemic started to disrupt the world and it hit South Africa in full force by March 2020, forcing the country, like the rest of the world, into lockdown. Academic libraries had perforce to close their physical spaces and rely on providing access to information and learning support by means of their digital collections and services only. The UJ Library continued its engagement with the changing world of work and hosted a second international conference, **From Zero to Hero – Rising to the Challenge in a Time of Crisis**. The conference was hosted in partnership with the Association of Commonwealth Universities (ACU). The focus was on sharing stories of difficulties, disruption, and failures, and how these challenges were used as a means of growth and development.

A third conference in partnership with the ACU followed in 2021 and this time the focus was on **Conversations about the Journey of Change: a "New Normal."** Contributors told the story of how academic libraries became fully integrated virtual and physical spaces in a very short span of time.

They managed to build additional capabilities, and develop new services and innovative ways to support their users during very unusual circumstances.

The chapters included in this collection are based on a selection of papers initially delivered at these conferences. Contributors are from South Africa, Uganda, Mauritius, and the West Indies.

The importance of this volume cannot be overemphasised. It reflects on how academic libraries are moving from traditional and hybrid academic librarianship to participating actively in the academic environment created by the 4IR and the COVID-19 pandemic. Robots are coming to libraries, Google can find 'anything,' while social media is already widely used by technology smart students. Academics and academic libraries are engaging with these developments and harnessing it to ensure a relevant and productive future for themselves.

Johannesburg
March 2022

The Fourth Industrial Revolution and Academic Library Practices

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University of Johannesburg

Abstract

As we begin to fundamentally redefine our world, informed through the Fourth Industrial Revolution (4IR) lens, entire industries are gearing up for this disruptive event. Library practices have been no exception. With the advent of advanced digital technology, knowledge is becoming more readily accessible. This chapter focuses on how libraries need to respond, adapt, and transform to become meaningful spaces in our rapidly changing 21st century, within the 4IR and coupled with the restrictions of the pandemic. Tracing the evolution of technology over the centuries, the changing role of the library as a response to disruptions is discussed.

Keywords: South Africa; new trends; academic library; library practices; Fourth Industrial Revolution; 4IR; disruption; pandemic

Introduction

In 2003, Matthew Battles referred to the unquiet history of libraries, tracing the various ages of information, and the library's role. Despite its tumultuous history characterised by a recurring theme of fear and destruction, the library stands out as a tale of triumph in the pursuit of knowledge. As Battles (2004:11) eloquently explains,

> *In the stacks of the library, I have the distinct impression that its millions of volumes may indeed contain the entirety of human experience; that they make not a model for but a model of the universe. Fluttering down the foot-worn marble stairs that drop into the building's bowels, descending through layer after layer of pungent books, I am often struck by the sense that everything happening outside must have its printed counterpart somewhere in the stacks.*

According to Lyman (1994), a library is 'a place which defines the shared knowledge of a community and conserves its historical memory.' This is perhaps the most traditional concept of a library. The Covid-19 pandemic in tandem with the 4IR, encapsulated by rapid technological advances, has transformed

and overhauled entire industries, including libraries, which has necessitated a reimagining of operations. Klaus Schwab (2015) signalled the advent of the 4IR, arguing that it would fuse digital, biological, and physical technologies and blur the divide between the physical, digital, and biological spheres. As the pandemic raged at the beginning of 2020, it became apparent that higher education, and by default the academic library, would fundamentally need to undergo an overhaul. In 2017, a discussion at the International Federation of Library Associations and Institutions (IFLA) (Church, Butz, Cassell, Kamar, Swindells, Tallman, & Snellenberg 2017) observed that libraries increase literacy in society, produce informed and participative citizens, and are reliable information brokers. The focus of this chapter is to argue that the wide-sweeping changes prompted by the 4IR and pandemic lockdowns offer a rare window of opportunity for academic libraries to transform their services and, more importantly, create new vistas required by the users. The pervasive impact of the 4IR is visible across a multitude of spheres like banking, logistics, finance, and education. Our traditional experiences are now being subverted and the pace at which the required changes are needed, vary across sectors.

The library is undergoing an evolution 'to become less about brick and mortar and more about the access to knowledge in a digital sphere' (Marwala 2019). This is a pivotal transformation in a country such as South Africa, where the legacies of Bantu education, which represented a segregated education system based on race, still pervade. The Bantu education system was formulated to keep African education separate and inferior (South African History Online 2011). Access to knowledge has thus been shaped and honed by apartheid histories and exacerbated by deep inequalities in our society. Access to libraries is an essential vehicle in support of the goal of access to higher education. The creation of digital spaces can widen access that was previously relegated to a narrow audience.

The shift to online modes of learning has been a powerful tool in increasing access to education in South Africa, particularly when one considers the spatial limitations of institutions. It allows higher education institutions to target students beyond the capacity of classrooms, which has been important in beginning to provide solutions to the digital divide. Yet, it is crucial to outline that this still does not address the vexed issue of leaving people behind because of a lack of access apparent through the digital divide (Marwala 2019).

One manifestation of this is the access or lack thereof to the internet. As a Statistics SA Report (Statistics South Africa 2017:120) states, "the proportion of households with access to the internet connection in South Africa grew significantly from 23.9% in 2009 to 62.2% by 2017.' The statistics indicate that although there was an increased access to internet connections in households in rural areas, there was a significant lag when compared to urban

areas indicative of South Africa's stark and prevailing digital divide. While solutions in the form of public Wi-Fi and national data interventions begin in part to address this and merit the discussions, it is apparent that there is a role for academic libraries to play in providing further access to knowledge. As the internet has demonstrated, the evolution of libraries also completely encompasses digital spaces. Mandal (2015) narrates: "The future library is bigger than all the world's historical libraries combined and smaller than a book on one of those libraries' shelves. Such a thing has only previously been conceived of in fiction.' Libraries have shifted towards information networking since the advent of the smartphone (Marwala 2019).

The Impact of the Pandemic on the Role of the Academic Library

As the Covid-19 pandemic spread globally in 2020, it became apparent that entire systems and processes would have to transform. Faced with the need for social and physical distance and due to national lockdowns, remote study, and work, there was a distinct shift towards online offerings, new networking, and co-working platforms, and the rise in popularity of e-learning modalities and sites such as Google Classroom. This represented the proverbial future library in practice.

Lozada (2020) asserts that the pandemic accelerated changes that were already underway, particularly the increasing reliance on digital technologies and a deepened digital divide. South Africa's digital divide, which is characterised by various factors such as internet access, skills, levels of education, and the pace of technological innovation, is representative of the country's deep inequality and inequity. It is apparent that our digital divide, just like many of the other inequalities, corresponds to race, gender, and class. In a country blighted by a growing chasm between the wealthy and the poor, the digital divide leaves vast swathes of our population behind (Marwala 2019).

University libraries with resources and a clear vision were already adapting and evolving to the digital environment before the pandemic. The library had to undertake significant business reengineering to contend with technological advances. This included a reconceptualisation of services and functions, reskilling staff to acknowledge that traditional jobs within a library environment would change significantly, and creating new systems prompted by the digital environment.

The library of the present has to look ahead and imagine the future library. The terror induced by the vision of 'the robots are coming' is completely false regarding libraries and the innovative ways in which the 4IR has been embraced. It resembles an explosion of knowledge spaces and a widening of access in multiple ways. The leveraging of new services and functions of the 21st-century library has the inherent possibility of pushing the

frontiers of research to new levels. For example, digital cataloguing enables the discovery of all written works related to a search within minutes. Whilst there was undoubtedly a pleasure derived from dwelling in the archives, it was conceivable to miss scores of relevant information. In the case of the fire that engulfed the Jagger Reading Room at the University of Cape Town (UCT) in April 2021, thousands of valuable items from the African Studies Collection were lost. Digitalisation could have mitigated much of the losses that occurred there (Satgoor 2021). Among the resources which were destroyed, were the majority of the African Studies Published Print Collection, the entire African Studies Film Collection on DVD and various government publications. A valuable lesson inherent here is that the university had already commenced digitising special collections and archives. If they had not, the losses would have been dire. Although there is value in having physical copies, it is apparent that we must invest in creating lasting digital copies if we are to preserve our resources, especially since the technology is available. Valuable lessons from the past have also taught us that our choice of digital resourcing is essential to ensure that it is lasting and not rendered obsolete with the advent of new technologies.

Leadership at the helm in higher education must invest wisely in creating the future library. It is unthinkable for higher education to leapfrog into the 21st century, leaving behind the critical cornerstone of a university – the library. While individual institutions may adopt different strategic pathways for overhauling libraries, there is also a need for national collaboration and international partners. Viewing the library as an edifice located in a physical space and geographically bound, is decidedly archaic. The library is no longer a gatekeeper for knowledge. The proverbial doors remain wide open on a 24/7 basis, cutting across all geographical boundaries. Embedded in this fact is the mega potential for widening access to knowledge, especially in a country with a deep legacy of inequalities and inequities.

The Impact of the 4IR on Academic Libraries

Managing the flow of information, knowledge, and resources has been a critical function of academic libraries. In a dynamic world where information rapidly changes, expands, and evolves almost at the same speed as technological changes, libraries can position itself as knowledge hubs. Historic libraries, whether in the seminaries of Africa or the early institutions of Europe, have served as spaces for sharing, organising, and widening access to knowledge, and documenting the intellectual histories and archives of states, regions, and cultural groups (Nampala, Kityo, Makuma-Massa, & Adipala 2017). Scholars, students, and public members have found refuge in the physical spaces of libraries.

The shifts and rapid transitions to technology are not new phenomena as, over the last three decades, knowledge mediated by evolving technologies have overtaken knowledge on paper. 'Ink on paper,' exemplified by the printed journals that lined the shelves of libraries along with hardcopy books, is now a rarity. With its vast computing power currently providing wider access, the internet provides its readers with a myriad of choices from around the world. The power of the devices used to access information, renders physical spaces, making paper-based resources irrelevant, unless these are repurposed and reconfigured to keep abreast with the changing digital revolution. While libraries have historically been a critical resource in organising, sharing, and curating knowledge, they are also at risk of becoming antiquated as information is increasingly digitised and available through ubiquitous technologies and platforms such as Google (Lewis 2007).

As higher education institutions transform, driven by artificial intelligence (AI) and cyber-physical systems, libraries need to be reimagined to embrace both the physical and virtual spaces (Xing & Marwala 2017:15). We need a combination of physical and virtual environments that can facilitate access to knowledge. With every user's potential to access a global library on their devices, the library has to lead the charge in creating these common spaces. What we need are smart libraries keeping abreast with smart new technologies. These are the rules of survival in the 4IR. The skills required in the 4IR are agility, resilience, responsiveness, and adaptability (Deloitte 2018). A library has to shed the cobwebs of the past, display its skills, and move into the future.

The rapid globalisation of the world economy in the latter half of the last century, and the accompanying expansion of higher education as a global industry, have both cemented and problematised the historical role of academic libraries, as the world continues to undergo an intense change (Lewis 2007; Jain 2013). The notion of a 'knowledge economy' has characterised these changes, given that knowledge and information flows have become an essential 'productive factor' in developing, innovating, and shaping global markets, social worlds, and cultural experiences (Shanhong 2000:3). It is not argued that the academic library will lose its value, but that its function will continue to be interrogated to re-evaluate the role of libraries in the 21st century and for the already present '4IR.' No university can exist without a library. Logically, if higher education institutions are transitioning into spaces where technology is not feared but embraced, it is rational that the library has to innovatively advance as well. Just like other spheres of society being impacted by the 4IR, even job functions within a library have to change. For example, at the University of Johannesburg (UJ), staff who were shelvers, have had to be reskilled to perform other tasks such as running audio-visual equipment. During the lockdown periods, the library asserted its role in new

and exciting ways to continue providing access to resources to both staff and students. Using multiple technologies, events, training sessions, and repurposing digital spaces in creative ways, the library bolstered the academic programme as the university shifted to emergency remote teaching, learning, working, and researching.

The Opportunities Presented by the 4IR for Academic Libraries

It is a misnomer to claim that the industrial revolutions have followed each other consecutively. The reality is that the transitions overlap and co-exist with shifts not being heralded with warning signs. The Third Industrial Revolution (3IR), characterised by the enhanced use of digitisation, electronics, and information technology in productive and generative processes, is argued to transition into the 4IR through increased specialisation, hybridisation, and the use of inter-disciplinarity to solve complex social/economic/ecological challenges. In this sense, many of the concerns surrounding the role and function of libraries in the 4IR, have already emerged in the course of the 3IR, given the major impact of information technologies on the disruption of long-held processes, practices, and skills (Ocholla & Ocholla 2020:356). Given that the warning signs heralding change have been around for some time, the reimagining of a library is not a once-off event, but should have been a sustained change over the years with due attention paid to technological advances.

In the financial sector, an increased reliance on technology, big data, AI, and cloud computing has drastically changed the traditional roles of the accountant, for instance. By implication, the library also has to keep pace and be ahead of the race. What is not questioned is that libraries are much needed. To stay ahead and assure itself of relevance, libraries must be acutely aware of how knowledge is being created, stored, accessed, and retrieved. An additional layer understands the changing profile of users who have access to the internet, which opens the proverbial doors to information in many forms. It can be debated that it is not merely the adoption of technology required. The library has to be reimagined in terms of its functions, the form it presents, systems, and processes.

Regardless of how we grapple with the previous three revolutions, technological advances require us to adapt without discounting our challenges. Ultimately, however, many companies are afraid of adopting 4IR related technologies because of the perceived steep costs of new technology. This, it is argued, is far outweighed by the economic benefits of turning to AI or nanotechnology, for example. There is scope to incrementally add 16% or around $13 trillion by 2030 to the global GDP. When disaggregated, labour automation could add up to 11% or approximately $9 trillion, while product and service innovations could add about 7% or around $6 trillion (Bughin,

Seong, Manyika, Chui, & Joshi 2018). Libraries have a vital role in providing the kind of knowledge resources that can propel core industries towards innovation, practices, and avenues for growth.

Lewis (2007) offers a multi-pronged strategy for preparing libraries for the 21st century, suggesting that libraries are a means, not an end, and could maybe be displaced by more appropriate means (e.g., online repositories and databases) as the available technology develops. However, he argues that libraries still serve essential social and intellectual functions that should be emphasised and strengthened even as some of its other functions fall away (Lewis 2007). In his view, while some functions may become the operational concern of larger regional, national, and global bodies – such as the digitisation of print and legacy collections and the curation and management of new, large-scale databases – other functions are essential to the everyday knowledge projects of the universities with libraries, with the teaching, learning, and research enterprises that form its core work (Lewis 2007). For this reason, greater focus needs to be given to developing the resources, tools, and expertise that enable libraries and those who work in it to support students and staff in navigating and drawing maximal benefit from the new knowledge ecologies available to them. Libraries need to adapt to receiving digital resources, which require different forms of organisation to be accessible. Once again, changes occurring in other spheres have to be considered when a library adopts a trajectory of change.

Ocholla and Ocholla (2020:359), as well as Abubakar (2011:446) support this view when they suggest that academic libraries are increasingly required to provide services to its users, rather than be sole or primary sources of knowledge. Instead, people use libraries to identify multiple pathways to the knowledge they seek and draw on library services to support their (mostly) independent search for information and resources. In their review of library services at 26 South African universities, Ocholla and Ocholla (2020:360) found that several key avenues for future development exist that could strengthen the role that academic libraries can play in supporting students – including disabled students and those from marginalised backgrounds – as well as providing the kind of services that facilitate learning and successful teaching and research (Ocholla & Ocholla 2020:360). This is particularly significant, given the impact of the Covid-19 pandemic on the pivot to online learning and the fault lines of inequality that the pandemic has highlighted in the South African higher education sector and society more broadly. For university libraries to fully embrace the 4IR, it first needs to make full use of the possibilities enabled by the 3IR, including providing a positive and exciting user experience through its digital and online support services and library websites (Abubakar 2011:446; Ocholla & Ocholla 2020:360).

The Impact of the Pandemic and 4IR on Services Offered

Given that physical access to libraries has now been proven unpredictable due to the pandemic, it is essential that libraries' online presence provides a comparable, if not superior, experience to contact encounters. Equivalence of services should be a primary objective and bridge the gap for users who now need to be tech-savvy to utilise the library. This does not signal the end to browsing the aisles in libraries, but forms a segue into new forms of browsing.

The pandemic propelled higher education institutions to pivot around remote teaching and learning. This required all other services offered by universities to undertake a rapid turn to the online world. The UJ library reconceptualised services with agility, having already embraced technologies cognisant of the need to keep abreast and ahead of the disruptions of the 4IR. From mobile apps to chatbots, the library asserted and navigated the vagaries of the pandemic, proving that despite restrictions, a wide array of services could be provided. For example, the Makerspace in the library, bringing technology and creativity together, printed 7,000 face shields to support frontline staff during Covid-19. This is a far cry from consensual understandings of a library and its functions. The library has ramped up its online presence with outreach programmes for staff and students, an array of seminars and talks, robust library guides, and making its presence felt in the lives of the UJ community. These are some examples of the changing role of the library.

Jain (2013) maps out the major changes that exemplify the 21st-century library, a number of which bears repeating here. Academic libraries of the 21st century are now able to offer knowledge on-demand, rather than during operating hours; direct users to massive online databases where multiple users can access resources simultaneously, rather than relying on limited print versions; direct funds towards providing electronic resources such as computers and printers that facilitate independent work, rather than printed books and volumes; and support the digital curation and archiving of printed documents, grey literature, and out-of-print texts (Jain 2013). These changes are essential because it both disrupts existing library operations and carves out new avenues for growth and innovation for library managers and staff. Gorman (cited in Jain 2013:137) further expands on the five library science laws: Libraries should work for humanity; respect all knowledge communication media; intelligently use technology to improve service; safeguard open access to knowledge; and respect the past and build the future.

These 'laws' exemplify the role that libraries have to play in the transition to the 4IR, mainly that it can effectively act as leaders in a growing information revolution that critics argue would render these facilities obsolete. Instead, libraries can act as gateways or portals to the vast expanse of knowledge that is now readily available. Library services are geared towards

supporting the critical discernment and use of this knowledge (Jain 2013:143; Ocholla & Ocholla 2020:364). As the nature of the knowledge economy shifts and transforms, library services will be increasingly integral to ensuring that users develop the requisite skills to engage critically with much broader yet more uneven knowledge ecologies. As new forms of universities emerge (Xing & Marwala 2017), libraries, through the lenses of creativity and innovation have to evolve. Changes in higher education such as open and distance learning, online education ventures, virtual campus, flipped classrooms, m-learning, and learning management systems have brought about diverse patterns which require different types of information (Chutia 2015:258).

Libraries have evolved from their elite beginnings and are now widely and readily accessible to the public, providing access to knowledge as well as a space for communities. For a country like South Africa, where education has been unequally accessible, impacting access to knowledge, libraries can provide a dynamic space to address this by not limiting itself to a geographical area. This could mean providing access for all to the library, or libraries for all. This argument may be significant, given that the internet is such a rich resource.

The 4IR era is a time of disruption for libraries. Writing from an engineering background and being a Vice-Chancellor of a university, embracing technology is what we do naturally. No sector is impervious to the impact of the 4IR. For example, in the manufacturing industry, line operators can adjust the behaviour and operation of robotic arms in real-time on the user interface, which has increased their capability to support human operation and safety standards. Even a library can use robots to do menial tasks (Marwala 2020).

Despite misconceptions that the library has long been static, it is apparent that libraries have undergone a continuous evolution, albeit at a slow and steady pace. The library has certainly adapted to the technological revolution through automated systems, digitised collections, the introduction of computers, free Wi-Fi, and the provision of access to e-books and e-readers. It provides undoubtedly scope to adopt more technology such as *Ivy Guide*, a device attached to a pen to translate words (Marwala 2019). This is particularly attractive in a country such as South Africa, which has 11 official languages, often acting as barriers to access knowledge. Elsewhere, tools for translation can be used to ensure that indigenous knowledge is stored and collected from primary sources.

The NMC Horizon Report (2017:34) suggests that the shift in focus to digital resources will directly impact the role of library professionals who will need to learn evolving skills to develop the capability to employ the latest technologies for teaching, learning, research, and innovation. Within the 4IR, librarians need to extend their professional development.

The Horizon Report also observes a shift in how students use libraries and notes that students rely less on libraries as the primary source of information, and regard it more as a place of socialisation (NMC Horizon Report 2017:9). Students now expect to learn and work everywhere, with continuous access to learning materials and one another for collaborative learning. This offers new opportunities for staff and students to develop the kind of critical skills that enable them to transition into a rapidly changing global economy, the dimensions of which have yet to be fully revealed.

Conclusion

The role of libraries has not diminished. Its scope has expanded and as libraries expand, so too does knowledge. Like every sphere of society, the library is not impervious to disruptions and cannot be slow in transforming and innovating. The shift towards online modes of living, learning, and working in the context of the pandemic has redefined the role of the academic library, which has contributed significantly to the widening of access and the leveraging of new digital services. The library of the future is one that embraces both physical and virtual environments. Technology, big data, and AI are incredible tools that can open magical worlds of knowledge if the library is bold enough to look into the future to create brave new worlds.

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Steering and Rowing through a Crisis

Pandemic Leadership in Higher Education

Kirti Menon, Angina Parekh & Saurabh Sinha

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Abstract

Navigating the 'new normal' imposed by the COVID-19 pandemic in 2020, requires agile and effective leadership to guide the South African higher education institutions through a looming crisis that would affect teaching, learning, and research indefinitely. In this new academic year (2021), lessons and insights from this experience can be identified and articulated for their impact on prospects and possibilities for leadership. This chapter uses the experience of the University of Johannesburg to describe the strategies which were used to support the transition to emergency remote teaching, the management processes that underpinned the transition, and the factors informing future efforts to bolster institutions against crises. It furthermore focuses the attention on the pedagogical implications of the response to the pandemic alongside the new demands which were placed on a higher education landscape that was already mired in complexity, scarcity, and change. The strategies used to chart an alternative path for universities through the pandemic will continue to inform the development of new pedagogies, learning modalities, and management strategies to support navigating through an increasingly uncertain and unpredictable global landscape.

Keywords: COVID-19; pedagogy; higher education; crisis leadership; governance

Introduction

The COVID-19 pandemic precipitated a crisis of a truly global nature, where higher education systems were thrown into turmoil and stakeholders across management levels needed to coordinate responses in order to save the academic year. With the first murmurs of a looming pandemic, the higher education sector perhaps did not read the warning signs early enough. The start of the academic year in South Africa, in January, is usually marred by funding challenges and the battle for admissions at universities which offer limited spaces (Badat 2016; Misra 2019). Against the backdrop of this already fraught context, the pandemic became a reality with rapid announcements of

South Africa's lockdown in March 2020 which essentially called for a halt to all activities and a confinement of its people to their homes. Like the rest of the country, the University of Johannesburg (UJ) entered lockdown, signalling an end to teaching and learning in the traditional contact mode. The world as we knew it would change, opening the space for new narratives and a reimagining of the university.

Central to any examination of this period, is a focus on how higher education institutions navigate periods of disruption. This question matters particularly, given the potential that disruptions have to 'tear at the fabric of…institution[s]' (Gigliotti 2017:1) and to destabilise their ability to deliver on their core educational project. The pandemic and the Fourth Industrial Revolution (4IR) together opened new possibilities for universities as a result of the major shifts needed to the model within which universities operate, and which required deft steering and architectural shifts to support the reorientation (Motala & Menon 2020).

At the beginning of the pandemic, a number of issues and challenges confronted higher education institutions as they managed the pivot to online and emergency remote teaching (ERT). On one level, there were important shifts needed in the institutional planning and management, requiring agility and flexibility in the trialling of new interventions and processes. However, there were also significant material considerations, including the financial, environmental, and resource constraints faced by students and some staff, and the importance of resolving these barriers to participation, in order to safeguard the academic year in whichever form it would need to take. This chapter considers the decisions that had to be made and the ways in which it called on the prior experiences of UJ's management team, enabling the strategies which were used to support the transition to ERT, the management processes that underpinned the transition, and the factors informing future efforts to bolster institutions against crises. The focus is on the key lessons that were learned from the pandemic experience while not losing sight of the emergent possibilities for future work in higher education leadership, teaching, and learning.

At UJ, the governance model which was used, emphasised participation in both the making and implementation of decisions. This deviation from traditional centralised models of governance which are dominant in higher education (Misra 2019), enabled information at UJ to flow in multiple directions and stimulated the ownership of the processes which were required for a major shift to online teaching. Osborne and Gaebler (1992:32) argue that 'those who steer the boat have more power over its destination than those who row it.' It can be counter-argued that in the pandemic crisis, whilst management could steer, it had also to focus its attention on the mechanics of rowing, on the path

to the destination and, more importantly, on how to counter challenges or obstacles on the journey. The section to follow provides some differentiation between the practices of 'rowing' (management) and 'steering' (leadership) in order to inform a discussion of the strategies which were taken at UJ to offset the worst of the effects of the pandemic's fallout on higher education.

Charting a Course Through Crisis

It is a fact that university leaders find themselves at the helm of institutions that require continuous change, in an environment characterised by 'steady-state chaos' (Gigliotti 2017:92). Ordinarily, they rarely encounter the kinds of crises that could create lasting institutional damage and are therefore less likely to be prepared when it occurs. By way of illustration of 'steady-state chaos,' perennial disruptions due to fees, admissions, or student loans characterise the South African higher education system (Jansen 2017).

To 'chart a course through crisis,' institutions must have a clear sense of where they are going, with the challenges currently and potentially affecting their operations, and the tools they have available to find their way through. The complex interrelation between higher education institutions and the societies that they serve has thus given rise to a field of scholarship, concerned not only with crises within higher education – such as internal conflicts about the meaning and canon of disciplines, or the pace of transformation and diversity initiatives – but also crises affecting higher education, emerging from mainly external factors. It is recognised that while higher education institutions are vulnerable to both internal and external shocks and shifts, crises also emerge as a result of the confluence of internal and external dynamics that affect an institution's capacity to neutralise the worst effects of an event (Gigliotti 2017; Misra 2019). The following example is illuminating in this regard.

Prior to 2020, South Africa's most recent encounter with a crisis on a massive scale was the #RhodesMustFall (RMF) and #FeesMustFall (FMF) protests that erupted in 2015. During these protests, classes were regularly disrupted and often cancelled; gatherings sometimes turned violent as a result of the tensions created by heavy securitisation on campuses; and important events on the academic calendar, including exams, were threatened by the uncertainty and unrest that existed on campuses around the country (CSVR 2017). These experiences were not uniform, however, with cleavages of race, class, and geography cutting across the system and impacting the strategies that were taken at different institutions to resolve the crisis and return to teaching and learning.

RMF/FMF is a classic example of how a national crisis can erupt with quite local and institutionally distinct effects and features. While some universities were forced to cancel classes and sometimes shut down entirely,

others, such as UJ, did not lose any teaching days and managed to continue the academic programme relatively successfully. In part this can be attributed to the existing infrastructure, planning, and resourcing that could support the rapid shift to ERT, as UJ had been developing these facets of its institutional offering in preparation for the 4IR (UJ 2020).

In a sense this is where the RMF/FMF experience did not sufficiently mirror the COVID-19 pandemic's impact. While university leaders were plunged into a state of crisis during the student protests, there was space within their management practices for the worst effects of the disruption to be ameliorated. By contrast, the pandemic has a global reach with direct national consequences, unevenly impacting multiple levels of university operations from teaching to research and strategic partnerships (Izumi, Sukhwani, Surjan, & Shaw 2020; Mncube, Mutongoza, & Olawale 2021). The pandemic with its 'shock and awe' left leaders with little time to craft strategic responses before the demand for action became overwhelming. Whilst countries have had to deal with crises of different orders of severity, like the tsunami in Thailand in 2004 or the Tohoku tsunami in Japan in 2011, there have not been crises since the world wars that had the kind of global impact that the COVID-19 pandemic had (Motala & Menon 2020). How then do university leaders manage crises with this kind of long-term reach and impact of COVID-19 in a context where the variables of the pandemic are unpredictable, and the ramifications extend beyond the control of any university leadership team?

It is remarkable that crisis situations have the potential to throw generally effective leaders and leadership strategies into turmoil. In part this can be explained by the sheer unpredictability that is generated by crisis periods, which runs counter to the predictability or consistency that is required for organisational leadership practices to be effective on a day-to-day basis (Fortunato, Gigliotti, & Ruben 2018). The FMF experience at UJ demonstrated that despite the unpredictability of a mass student movement that threatened to destabilise the core project of higher education, the leadership strategy that was adopted at the university was able to counter and ameliorate major disruptions. There is a need to recognise that UJ's experiences with the FMF crisis enabled it to steer this university through the pandemic crisis – this, despite the fact that Genshaft (2014) admits that higher education as a sector is generally poorly prepared to deal with crises, given the low frequency of its occurrence coupled with the tendency to focus on the educational project at the expense of developing capacity to deal with the unforeseen. Here crisis is distinguished from the 'steady-state chaos' that is mentioned previously. Chaos speaks to the idea of disarray or turmoil, while crisis is defined by participants, according to the research of Gigliotti (2017), as any unpredictable event that disrupts the core work and mission of the institution and could lead to lasting damage reputationally, infrastructurally, or operationally. Thus,

while 'chaos' defines the day-to-day experience of those running universities within Gigliotti's study of higher education crisis management, it shifts into 'crisis' at the moment that lives are placed at risk or when disruptions render normal academic routines impossible. This intense disruption became the case for many universities during FMF and other governance crises.

In an important analysis of crisis leadership during the FMF movement in South Africa, Misra (2019) proposes three core assumptions that inform an understanding of crisis leadership: 1) Leading an organisation during a crisis is different to leading it under normal circumstances; 2) crisis management is different to crisis leadership; and 3) crisis leadership is a unique practice that is deeply impacted by context. While this seems self-evident, on closer inspection, it provides a framework for understanding the features that distinguish crisis leadership as a practice and field of inquiry.

Institutional responses to crises veer between crisis management and crisis leadership, where the former is concerned with the procedural and operational direction which is required to bring situations under control and delegate roles and responsibilities. The latter requires university leaders who are capable of executing a vision through the crisis, offering support and guidance to staff, students, and other stakeholders, and harnessing difficult situations towards productive and generative outcomes (Fortunato *et al.* 2018; Motala & Menon 2020). Crisis management is described as procedural, technical, and operational, focused on identifying and fixing problems as it emerges, directing resources and personnel, and reconfiguring operations to secure the situation (Porche 2009; Kahn & Louw 2013). Crisis leadership comprises and goes beyond crisis management to include managing the social and broader institutional dimension of the crisis, including guiding stakeholders towards a long-term vision, managing psychosocial and environmental support, and identifying opportunities: 'Leaders who can manage crisis events successfully can create opportunities for organisational renewal while developing their own skills' (Ulmer *et al.* 2011, cited in Misra 2019:33).

In the case of the FMF/RMF movement in 2015, it was clear that university leaders largely resorted to crisis management when the student movement was still emergent and relatively unpredictable in its course of action. In Misra's study of six universities affected by RMF/FMF (Misra 2019), she finds that staff reported events being managed on an *ad hoc* basis, with vice-chancellors spreading thin across trying to manage stakeholder relationships, be present during campus unrest, and delegate responsibilities across staff. The key concerns underpinning this approach were to ensure that the academic year could be salvaged and exams could be written. However, there were also concerns specifically related to managing the unfolding protests, including balancing the need to protect students' rights to protest

against the safety of other staff and students, and protecting university facilities (Jansen 2017; Habib 2019).

By 2016, with protests becoming an increasing feature of the university calendar, vice-chancellors and other university leaders started to take seriously the need for a more coordinated, strategic approach to managing the crisis, including improving communication, 'delegating certain responsibilities to different offices, and working systemically with other university leaders, as well as the Ministry of Higher Education and Training' (Misra 2019:85). There was recognition that this was now a system-wide issue, requiring a more coordinated response, with greater collaboration among university staff as well as between leaders at different institutions (Jansen 2017; Misra 2019). An important lesson from the FMF/RMF movement for the COVID-19 pandemic was that leading in times of crisis goes beyond managing the event and its immediate fallout; it requires the sensitive handling of relationships, identifying and pursuing a long-term vision that appropriately responds to the gaps or tensions that are illuminated in the process, and ensuring that effective planning and monitoring are in place to deal with future events. These became central to navigating the novel circumstances which were resulting from the pandemic, ensuring that teaching and learning would be at the core of UJ 'way through' an unfolding crisis.

Responding to the Pandemic: Steadying the Boat

Though the university's mission and purpose centre around teaching and research, the extreme complexity of each of these areas requires substantial contributions from a wide variety of stakeholders, systems, structures, policies, and more. The vast interconnections and multifaceted natures of the various structures and systems involve students, academics, management, administration, and various other affiliated structures and stakeholder groups. The impact of the pandemic on each of the stakeholder groups at UJ extended beyond the individuals into the university context and into their immediate and extended families, networks, and environs.

Whilst the university community, comprising staff and students, was the major constituency that needed to be focusing on the core functions of the university to continue, the supply chain that is contingent on the university was also affected. Critical to understanding UJ's response to the pandemic, was the fact that a myriad of decisions had to be taken, including the management of COVID-19 protocols, security, responding to government requests for information, and other matters related to the core operations of the university. This forms part of the process of 'steadying the boat' – ensuring that the plans, tools, and resources that were invested in navigating through the crisis are well-founded and sound. The collective leadership at UJ was always forward-

looking, with online capabilities developed as far back as 2005. This meant that the foundations were in place and would hold the university in good stead. The direction of teaching and learning at the university highlighted the critical decisions that had to be made and the key decision to continue teaching and learning, using an online learning management system. The immediate priority of the university was to deal with Semester 1 whilst planning ahead for the next semester.

The Vice Chancellor's Circular of 24 March 2020, which followed the announcement of a national lockdown by the President, signalled that it was not business as usual. UJ commenced its intense planning without awaiting signals from government. The university was already one step ahead and would later also provide strategic advice to government and other bodies, including universities in the system. Whilst at this stage, consideration had not been given to what would be a protracted period of multiple iterations of lockdowns. In the period following this communication, the senior leadership team at the university had to consider how to rescue the academic year and manage the consequences that unfolded with the progression of time. Unlike other institutions, UJ provided a safety net for students who were unable to return to their homes, allowing them to continue staying in residences with all protocols in place. The complexity of the decisions which were needed, must be viewed in the context of the headcount enrolments for the years 2020 and 2021 which, interestingly, demonstrated a marked increase, despite expectations that the pandemic would interfere with this (UJ 2020). UJ is a comprehensive institution, with a significant number of programmes requiring theory and practice, work-integrated learning (WIL) and/or internships. For example, both in social work and teacher education programmes, students needed to complete practicals in off-site environments in order to meet the requirements of the professional bodies and of the qualification. In science and engineering, modules comprise both theory and practical components that are linked and had to be reconceptualised and shifted to a block period of teaching, as lockdown levels eased. This would pose an additional significant challenge to the continuation of teaching and learning.

The apparent simplicity of the decision to continue teaching and learning belied the magnitude of the work which was required to affect this transition. The complexity of this decision would require an interventionist approach in order to cascade the decision into the various academic and support structures. UJ was in a position to utilise existing systems to kick-start these processes. Substantial investments had already been made to the ICT infrastructure and the learning management system (LMS), Blackboard (Bb) as far back as 2005. These became integral to supporting the transition to ERT, which is described by Hodges, Moore, Lockee, Trust, and Bond (2020) where in 'contrast to experiences that are planned from the beginning and designed

to be online, ERT is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances.' At UJ, the dilemma was to meet the challenge of remote teaching and learning whilst the university itself was working remotely. Prior to even government signalling that 'no student should be left behind,' UJ proactively planned, prepared, and implemented ERT.

Given the digital inequalities in the South African society, the use of online learning technologies (such as virtual and augmented reality) were not options that could be viably pursued. Academics used YouTube videos, home-made videos on cell phones, and voice and other WhatsApp facilities to demonstrate the practical skills that had to be developed. The UJ Quality Assurance (QA) Report (UJ 2020) describes in some detail the lengths to which academics went to take teaching and learning to the students in their various locations and contexts, but also acknowledges the limitations of online delivery methods, especially in the development of applied and practical competencies. Whereas the university provides the studio, laboratory, technical, and other spaces which are needed for teaching and learning in these areas, students in their homes did not have such access to equivalent facilities or resources. One of the lessons to be learned from this experience is that fewer limitations on access to higher education spaces across the country, such as to laboratories or libraries, would have enhanced the experience for many students over the period. The argument to be made is that higher education institutions in a time of crisis should seek ways to collaborate and share facilities, ideas, and resources to the benefit of both the staff and the students.

UJ has always articulated itself as the 'university of the people,' with a strategic focus on widening access and ensuring success. With more than 50 percent of students on some form of financial aid, available funding is not always conducive to optimal teaching and learning, with students needing assistance with accommodation, equipment, technology, food, and other necessities (UJ 2020). The UJ decision was reached in full acknowledgement of the ramifications that such a decision would have on its finances and operations. Once the critical decision of transition to ERT had been reached, a reprioritisation of budgets was almost immediately undertaken to ensure the appropriate resourcing that was required. UJ was financially sound and was able to draw on reserves in a climate of austerity. Tough decisions such as a freeze on new appointments with priority being given to exceptional cases, required for core business, no bonuses, and a critical review of budgets of the various domains were key components of the UJ strategy. In a climate where job losses would loom across sectors, UJ's messaging was important in that it focused on shaving off frills and recurring expenditure with reassurances that no jobs would be lost.

The decision to shift to ERT was predicated on the principle of equitable access, a paradoxical position given the fact that UJ had no control over the personal social spaces or circumstances that students found themselves in during the lockdown periods. How then did the institution pursue its social justice and equity principles, given the new challenges which provoked and exacerbated the already precarious circumstances in which many students found themselves during the pandemic? Bozalek and Carolissen (2014:16) argue for the need to 'create opportunities for people to participate on an equal footing' which aptly captures the dilemma that faced the university. It is precisely this recognition of inequitable access that underpinned the UJ response. Whilst students had accessed higher education in terms of enrolment as shown above, the pandemic created new hurdles for continued access to teaching and learning. These new barriers to access required a differentiated response.

To this end, while much has been written about the digital divide, bandwidth, data costs, and so on, there was also a widespread pandemic anxiety. The university recognised this anxiety as being pervasive, and through communication channels offered psychological support alongside concrete resources. There was a recognition that many of the students were vulnerable due to a host of psychosocial issues, and there was a strong focus on addressing these problems individually, where possible, or collectively. The intermediary for accessing knowledge is the LMS or any other modality that could be used by the academics and/or students at UJ but accessing the LMS proved to be a near insurmountable barrier in terms of obtaining access to the knowledge that was needed for some students. Once this has been resolved or in some way ameliorated, the resolution of this issue did not necessarily alleviate the stringencies of others. Along with the decision to continue teaching and learning, decisions had to be made to partner with private sector service providers for data and device provision. This required a substantial investment and redirection of resources, both financial and human, by the university. UJ did not wait for government directions to commence with dispersing laptops and devices. This initiative had already commenced in previous years and was ratcheted up as the need rose during the pandemic. The provision of data and devices is not the core business of a university but was recognised as a significant barrier to the continuation of the academic year (UJ 2020).

For the university, the decision to shift to ERT was unavoidable, as the alternative was the loss of the academic year with subsequent consequences for the sustainability of the higher education system and unimaginable ramifications for the economy and society. The socio-economic impact of the loss of the year would reverberate through the country, creating enormous pressure, resulting in a massively bloated higher education system. This is specifically true because in such a situation, new entrants would overlap with

those who are already in the system who would have 'lost' a year, creating an extraordinarily complex set of demands on staffing, enrolment plans, and the overall resource capacity of the university. Such a situation would not be sustainable for the financial viability of the university and the potential loss of subsidy and tuition fees, should the academic year not be completed. More broadly, the impact on prospective graduates and their employers would also have been disastrous, creating, for example a vacuum in the provision of newly qualified professionals to a variety of sectors and workplaces, like teachers, nurses, and engineers, to name but a few.

It was evident that the logic as described above could only lead to the strategic decision to cascade ERT, to mitigate risks, and to address gaps as they emerged. Rutter, Wolpert, and Greenhalgh (2020) indeed suggest that 'viable clumsy solutions' are essential to develop a sound evidence base and test out assumptions and ideas in real-world settings under conditions of crisis. They argue that information under these crisis conditions is often incomplete, uncertain, or sparse, meaning that solutions will often be imperfect and require constant interrogation and reconfiguration – but that action is often unavoidable.

In the space of less than three weeks from 24 March 2020 to the resumption of learning online on 20 April 2020, the university would make momentous decisions, all focused on achieving the core objective of 'no student left behind' (Motala & Menon 2020). These decisions include the following:

- Revising the academic calendar to provide the necessary flexibility.
- Instituting internal governance processes for managing curriculum changes in modules at faculty/college level.
- Provision of support for academics reviewing modules and creating a Bb presence.
- Establishing a COVID-19 Coordination Committee.
- Holding weekly meetings of the Management Executive Academic Committee and similarly at all levels of management.
- Creating a COVID-19 website with sections pertaining to teaching remotely, learning remotely, working remotely, and health and wellbeing. These sections were expanded as the year progressed to include statistics and valuable information and resources pertinent to gender-based violence.
- Proactively recognising and managing cybersecurity challenges.

Table 1 provides an illustrative snapshot of decisions that were taken and their pathways through the university structures. The table presents a matrix of examples of decisions that were made at executive level and cascades their impact on actions and subsequent decisions which were needed at each succeeding level in the university. Clearly, the table cannot fully capture

Table 1: Matrix of examples of decisions

Responsible body	Types of decisions	About	Teaching and learning	Facilities and resources	Monitoring and evaluation
Executive leadership	Strategic decisions	Teaching and learning to go online	Work/study remotely vs provision for residential students unable to go home	Provision of data and devices (staff and students)	Reporting, monitoring, and governance into internal and external structures
Faculty and division-level	Tactical decisions	Review all modules to ensure Bb presence	HR implications equipment/ access to systems; communications with staff and students	Reprioritise budget; assess device and data needs; alternatives to Bb where needed	Detailed reporting and oversight on specific areas of operations, e.g., student Bb participation data; assessment modifications, etc.
Academic and Support Departments	Operational decisions	All aspects of online delivery addressed	Establish mechanisms for support to enable students: Staff interactions; outline implications for WIL, practical learning, etc.; reconfigure all assessments; adjust all work-flow to meet online/off-campus demands	Delivery of devices and data packages to students/staff; schedule and implement online timetable; determine synchronous/ asynchronous balance and alternative routes	Monitor student activities online; support student wellness; manage staff workloads, online operations, and staff wellness
Individual staff members and students	How to continue T&L	Tools and techniques are needed	Where and how achieved?	Context-dependent	Feedback and support/ helplines

the complexity of decision-making and implementation in each case, but it provides a sense of the sequencing of events that were needed to ensure the implementation of ERT.

Table 1 demonstrates that individual members of the university community were able to participate in the process of devising meaningful responses to the COVID-19 crisis by cooperating with one another, alerting management and other structures to concerns and difficulties, continuously engaging with the students, and feeding the results of this back to the structures. The management and leadership skills which were evident at all levels of the university, showed a deep responsiveness and willingness to collaborate in the resolution of the problems which they had to face, like further entrenchment, with a culture of care and compassion across the university.

Successful leadership requires communication, care, and compassion, all three of which were evident not only in the individual responses to the pandemic at UJ, but across the institution's culture and practices. Meetings were used to collaborate, navigate, and consider matters at hand, enabling an information flow in multiple directions. Regular communication with staff and students was a channel to ensure proximity, create a community, albeit virtual, and provide information. This included the establishment of a COVID-19 portal with resources for staff, postdoctoral research fellows, and students. To 'steady the boat' through the uncertain waters of the unfolding pandemic, collaboration, communication, and responsive, ongoing organisation were essential to the crisis leadership strategies which were deployed at different managerial levels.

Pedagogical Intent and Approach

Globally, higher education institutions were faced with the mammoth challenge of transitioning their operations from contact delivery to online and blended alternatives in a rapidly unfolding pandemic (Cutri, Mena, & Whiting 2020; Peters, Rizvi, McCulloch, Gibbs, Gorur, Hong, Hwang, Zipin, Brennan, Robertson, Quay, Malbon, Taglietti, Barnett, Chengbing, McLaren, Apple, Papastephanou, Burbules, Jackson, Jalote, Kalantzis, Cope, Fataar, Conroy, Misiaszek, Biesta, Jandrić, Choo, Apple, Stone, Tierney, Tesar, Besley, & Misiaszek 2020). In South Africa, these efforts were sharply undercut by the heterogenous existing capacity and resourcing across institutions, as well as the variable contexts in which they were found. The South African legacy of apartheid has created fissures and an uneven higher education sector. The pandemic placed the same demand on a highly stratified sector, requiring it to embark on a massive pivot to online learning without the required time to appropriately sequence the steps which were required to support such an initiative. Curriculum development under ERT can be described as

haphazard and reactive, focusing on ensuring that the academic year would be saved, and learning could continue (O'Keefe, Rafferty, Gunder, & Vignare 2020). There was little time at the start of the transition to act deliberatively with due consideration of the pedagogical intent and approach that were needed. However, at UJ the academic structures and systems were put in place to consider changes to curricula with support which was provided for online teaching. It is noteworthy that conversations about curricula, rules of progression and combination, and the need to shift to a blended approach began a few years earlier. These proved useful in that it allowed for a smoother transition. An intense and concentrated period ensued with skilling and reskilling of both staff and students to contend with the shift to ERT.

Whilst the terminology that was used to describe this transition is quite strident, it encapsulates the experience of the head-on and rapid change to online learning in the early days of the pandemic. In hindsight, the weeks turned to months and, with the commencement of a new academic year in 2021, greater consideration of the pedagogy underpinning the curriculum was both possible and actively sought. Lessons learned from transitioning the existing courses and modules to ERT, include that effective curriculum design is essential to providing a robust experience to students in alternative teaching and learning modalities (Rambe & Moeti 2017; Motala & Menon 2020). By the end of 2020, as the university contemplated a new academic year, UJ carefully crafted a richer hybrid model of teaching and learning, based on the principles of physical distancing, requirements of the curriculum, and explorations of other modalities of teaching and learning. It is no longer assumed that existing modules can be seamlessly transposed into an online or hybrid space, given the challenges posed by technological accessibility, factors affecting student engagement and participation, and the limitations imposed in the cause of navigating a learning space that is still unfamiliar to most faculty and students. It is also important to recall the point which was made by Skulmowski and Rey (2020), that technology usage needs to be responsive, educational, contextually sensitive, and not merely about making learning 'entertaining.' In South Africa, context sensitivity is particularly poignant, given the distorted disparities in the student population.

Collaboration and Internationalisation

Arnove (2020) argues that universities will need to grapple with internationalisation in the context of reduced international mobility and new interventions in online and hybrid learning that break down geographical distances through technology. One example of this can be found in Hilli, Nørgård, and Aaen (2019), where a co-teaching programme was introduced between a Danish and a Finnish university in a course on educational design and digitisation. Students at both universities enrolled for the same course,

using platforms such as Zoom, Google Classroom, and WordPress to support their learning, and were taught by lecturers from both institutions (Hilli *et al.* 2019).

Joint online offerings are one strategy that Arnove (2020) advocates for, recognising that the COVID-19 pandemic presents a new opportunity for institutions around the world to connect lecturers and students through shared teaching, debates, and virtual sessions, as well as cultivating global networks to support local outreach and community engagement. Using a variety of online platforms, UJ's international staff and students were supported despite the curtailment of movement during the lockdown levels. Virtual town hall meetings were held with international students to bring them into a cohesive communal space whilst assessing their teaching and learning needs. Arnove (2020) suggests that such strategies signal a shift away from internationalisation-as-mobility or as the cultivation of new consumer markets in higher education towards internationalising the learning experience at the level of curriculum and practice.

This section has described some of the engagement and decision-making processes that unfolded at UJ during the first year of the COVID-19 pandemic, while offering some examples of how pedagogy, teaching, and learning unfolded. The UJ QA Report (UJ 2020) offers a wealth of insight into the 'nuts and bolts' of the institution's response to the pandemic, identifying the challenges that were faced by staff, students, and other stakeholders, as well as their impressions of the pivot to ERT. The following section frames these insights in terms of lessons or principles to support effective crisis leadership in higher education.

Steering and Rowing

The approach taken to managing the pandemic at UJ, offers several principles that can guide institutions and university leaders in developing their own response to a crisis, by building responsiveness and resilience into the everyday operations of institutions.

For one, the ever-growing digitisation and internationalisation of global economies and knowledge communities place universities under an increasing pressure to *develop an online and hybrid learning capacity*, as well as the support systems which are required to enable consistent, equitable, and comprehensive access and participation. The UJ case argues that keeping one step ahead of the game during 'normal' times, especially in relation to embracing innovative teaching and learning practices, was leveraged during the pandemic. Moreover, the support systems within a university must be informed by a commitment to *bridge the digital divide*, which would look different in different settings: Some institutions may have the capacity to offer

laptops, others may, with limited resources, only be able to provide tablets or smartphones. While these inequalities require urgent and more systemic solutions, working with the limitations that it creates, also shapes the design process that is required to build an online learning capacity because, following Skulmowski and Rey (2020), technology usage must be responsive and adapted to context in order to positively impact teaching and learning.

Menon and Castrillón (2019:7) argue that what universities need to change is how the 'development of skills may be achieved through curricula that are designed to enable learning and how these skills may be appropriated for multiple uses, flexibly, and readily extrapolated to diverse, future, and perhaps even unknown, contexts.' In a time of crisis, through its reflexive and flexible management practices, the university was able to respond to and create environments and experiences that, in line with the changing role and purpose of higher education, allow students 'to discover and construct knowledge for themselves' (Barr & Tagg 1995:5).

At UJ, during the COVID-19 pandemic, students became members of online communities in which they were able to discover aspects of themselves and their learning, as they worked alongside their lecturers to solve learning problems. The innovation of staff during the transition was showcased and celebrated. Given the likely emergence of new careers and the prospective technological developments of the 4IR alongside the demands of the pandemic, these are critical skills, the achievement of which is due in part to how the university understood the needs and imperatives of the new conceptual framework, underpinned by principles of hybrid learning. Clearly, while barriers to access persist, universities have a window of opportunity to leverage learnings from the pandemic and hone, and finesse it for the 4IR.

Conclusion: Reaching Open Water

Dealing with today and planning for tomorrow underpinned the UJ response to the pandemic, highlighting the importance of *building and deploying middle-management capacity* to be agile and capable of delivering quick, workable responses to emergent issues while also designing more thoughtful long-term solutions. Harnessing this wealth of talent, contributed to the response of the university with the required agility.

An important lesson from the UJ case is the recognition that leadership resides at all levels and is not exclusive to senior management. Concentrating decision-making at the top would only have slowed the process of managing the unfolding crisis, highlighting the need for institutions to become more collaborative and communicative in their daily operations, in order to build the kind of relationships and networks that can effectively coordinate under challenging and often unprecedented conditions. Finally, given the increasing

pressure being placed on higher education funding and fee payments, *transparency in 'balancing the books'* is essential to create an institution-level trust, not only for the students but also for the staff who had their own concerns around work security and potential job losses or salary cuts, while teaching, learning, and research continue to be the core function of universities. This will always be contingent on successfully managing, communicating, and resolving the 'bread-and-butter' issues that confront the university community, especially in times of crisis.

Crisis leadership is a concept that has grown in relevance for the management of higher education institutions, as internal contestations around access, resourcing, and epistemic justice coincide with external social, economic, and political currents. Leading in times of crisis goes beyond managing the event and its immediate fallout; it requires a sensitive handling of relationships, identifying and pursuing a long-term vision that appropriately responds to the gaps or tensions illuminated by the crisis, and ensuring that effective planning and monitoring are in place to deal with future events. Crises are unpredictable. It affects a wide variety of stakeholders and threatens to destabilise the operation of the organisation and its ability to deliver on its core mandate. Flexibility, responsiveness, and collaboration are more likely to deliver desired outcomes than a rigid adherence to existing policies, frameworks, and procedures that may not work in an unfolding crisis. In the context of the crisis, the regulatory and policy frameworks within the university environment were amended to be fit for purpose to achieve quality outcomes in the decisions that were made. These are some of the prescripts that the leadership at UJ followed in full recognition that this was a global crisis and that the purpose was to ensure the continuity of the academic year to create as equivalent a teaching and learning experience as contact teaching. With FMF there was a level of predictability, whereas with the pandemic the uncertainties were rife, required decision-making, and had to be pre-emptive. The only certainty was that the uncertainties were numerous and would evolve and change.

By 2021, the lessons that we have learned during the early days of the pandemic have stood the university in good stead as it now navigates new ground with a hybrid teaching model in line with the prescripts ascribed to this period of the pandemic. More importantly, whilst teaching and learning were priorities, the university continued its pursuit in terms of research, rankings, community engagement, and exploring collaborations and partnerships. The recognition that this model poses, challenges to epistemic access and cognitive justice, remains a constant concern. What the university has not lost sight of is the co-existence of the pandemic and the 4IR, and these factors have been taken into account as we navigate a brave new world. The university does not exist in a bubble, and while it charts a new course in this crisis, it also

has to grapple with its location in a society beset by a dire economic recession, shrinking resources, and a grinding inequality.

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Quality Assuring Unknown Territory

Reviewing the University of Johannesburg's Pandemic Teaching and Learning Approach

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Abstract

The declaration of COVID-19 as a pandemic by the World Health Organisation saw billions of students around the world unable to attend classes. On 15 March 2020, President Cyril Ramaphosa declared a national disaster and 'lockdown,' impacting every aspect of life, as the country shut down for 21 days and all educational institutions closed. The University of Johannesburg (UJ), one of 26 South African universities, with a total student population of 50,000 students was no exception. In this chapter, the authors critically reflect on the university's review of what has been termed education's 'new normal' and the findings related to the experiences of remote teaching and learning. UJ exhibits a deeply held commitment to social justice, equity, access, and excellence, and these values remained paramount during the course of the pandemic. In changing modalities to emergency remote teaching, using online and electronic platforms, UJ ensured the uninterrupted continuation of its academic and social justice goals. The UJ management approved a quality assurance process that was specifically developed to assess the implementation of Emergency Remote Teaching (ERT). The QA review addressed the period of remote teaching and learning from 15 March 2020 to 31 July 2020, which was the first semester. The intention of the review was to identify and share areas of good practice across the university, and to identify areas in which additional support may be needed, especially during the next phase of teaching, and considering the uncertainties surrounding the trajectory of the pandemic. To achieve this dual mandate, the review focused on the effectiveness of the transition to ERT and through an extensive process, which included reviews of modules online, interviews with academics, support structures, and other data analyses, the authors reflect and distil findings from the review report on ERT.

The findings of the review were not unexpected, especially given the digital divide and the need to build cognitive and social bridges to engage students in the process of learning and teaching. The mandate of the university

was to ensure that the academic year was not lost despite the disruptions, and that no student would be left behind. The experiences of academics, support staff, and students identified several unexpected benefits to the transition, highlighted hurdles which were encountered, and showcased innovative practices that emerged from necessity.

This chapter provides insights into the agility of the university's ERT response and is a reflective, introspective account of the UJ experience of teaching and learning during the lockdown, and implications for the future.

Keywords: Quality Assurance; Emergency Remote Teaching (ERT); COVID-19; staff experience; teaching and learning

Introduction

South African education was wrought from apartheid, with deep fissures of inequity and inequality in the system, resulting in a fractured system of higher education (HE). The equity of access to HE and success in the system largely remain stratified along race and class lines. The post-democratic South Africa, while unbound from formalised exclusion to HE, remains a context in which access is variable and is largely dependent on socio economic factors (Jansen 2009; Soudien 2012). In a South Africa that continues to be riddled with injustice, poverty, and inequality, it stands to reason that teaching and learning has to be rooted in and framed by a social justice perspective. Bell defines social justice as 'full and equal participation of all groups in a society that is mutually shaped to meet their need. The process of social justice should be democratic and participatory, inclusive and affirming of human agency and human capacities for working collaboratively to create change' (Bell 1997:3-4).

The HE environment remains, as Zinn and Rogers (2012:76) articulate, 'a battlefront, in which the struggle to build voice, agency and community continues.' This battlefront, already bedevilled by social, economic, and access inequities, suddenly had to face the challenge of the COVID-19 pandemic. In response to the pandemic's unknown territory, South Africa's President Cyril Ramaphosa declared a national state of disaster (15 March 2020). A nationwide lockdown took effect, and consequently, a prolonged period of disruption of the normal activities of a traditionally contact-based university ensued. The impact and the disruption were profound, requiring agile and coherent responses to save the academic year as the country proceeded through the various lockdown levels.

The University of Johannesburg (UJ) is a comprehensive institution, offering a wide spectrum of qualifications from higher certificates to doctoral degrees, with 80 percent of the student body in undergraduate programmes. The university's rapid pivot to Emergency Remote Teaching (ERT) had ramifications for all divisions within the university, including our diverse

student population. Hodges, Moore, Lockee, Trust, & Bond (2020:13) describe ERT as an attempt not 'to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis.' The battlefront, alluded to by Zinn and Rogers (2012), resurfaced with new points of deflection in 2020, as the pandemic unfolded.

As a juxtaposition to the inhumane poverty and equality, the inherent value of humanising pedagogies is a just alternative to building an 'inclusive, socially just, and democratic political order' (Delport 2016:6). Online learning, mediated by technology and hampered by poor and inequitable access, troubled the enactment of a humanising pedagogy, rendering difficult student participation and engagement in the learning process. With full awareness of the profile of the UJ student body, the university commenced the ERT process by affirming its commitment to social justice, equity, access, and excellence. This position, and the subsequent ERT mechanisms drove all academic and other activities. The disruptive nature of ERT at UJ 'provoked innovative pedagogical practices and even incidental or accidental learnings for academics and students' (Motala & Menon 2020:96). A key feature of the university's strategic plan (2014-2025) is a commitment to excellence in teaching and learning. This includes bolstering the university's capacity for blended and hybrid modalities by leveraging 21st-century technologies. It is this investment that allowed the university to use its existing resources, structures, and capabilities to enable its ERT.

A pandemic pedagogy refers to 'the approaches we employ in our learning environments to teach and foster learning in the context of a serious health crisis and the spread of a new disease' (Smith & Hornsby 2020:1). The haste with which universities were prompted into action, meant that there was little time to interrogate pedagogical approaches. Prompted by the speed of its transition to ERT, UJ elected to reflect on whether it had delivered on quality teaching and learning. This chapter outlines the process of quality review of ERT at the university and reflects on the findings, drawing on the report of the review (UJ 2020).

Quality Assuring ERT

The purpose of the review was to identify areas of good practice to be shared, and to identify areas in which support would be needed during the next phase. The review was premised on notions of fairness: How best to assess the goals of ERT and provide a 'safe space' in which staff members and students could reflect on their own experiences, and on the extent to which their actions had succeeded in addressing the need. To this end, the principles of fitness for and fitness of purpose, long-held values in the South African Quality Assurance

(QA) framework, and established measures of institutional quality referenced in the Council on Higher Education (CHE) audit and accreditation criteria, were relevant. 'Fitness for purpose' refers to the alignment between an institution's offerings and its mission and objectives. It locates the institution's mission and objectives in relation to local, national, and international dynamics. Fitness for and of purpose cannot easily be separated in determining a value proposition for quality. To meet both fitness requirements, the approach taken in the QA review aimed to assess the quality of ERT teaching and learning, and the experience of the transition by academic and support staff as well as students (predominantly undergraduate).

The Approach Used

The review made use of a mixed methodology, in an approach similar to that applied by the CHE/Higher Education Quality Committee (HEQC): Documents were surveyed, staff members and students interviewed, and the 'panel' of questioners' observations provided for a triangulation of the evidence which was obtained to reach a certain conclusion about the effectiveness of the ERT project. The approach to the review was designed to ensure that multiple perspectives on ERT were captured in the process.

At the start of the ERT project, the Centre for Academic Technologies (CAT) had surveyed 1,500 modules to determine the extent of module 'presence' in the learner management system, Blackboard (Bb). The modules were evaluated to ensure that a certain minimum was met: The learning guide was online, a welcome to the lecturers was in place, contact details for the relevant admin and support people were provided, and learning activities, assessments, and assessment feedback were included.

After the initiation of ERT, reviews of every module that was taught in the ERT mode were conducted by the Centre for Academic Staff Development among the student body. Using BlueExplorance, UJ evaluated 1,594 undergraduate modules that were offered to which 52,146 responses were received (a response rate of 28.95%). The reports per faculty and for UJ were drawn from the online evaluations. A Likert scale was used with 1 = Strongly disagree to 4 = Strongly agree. There was no neutral option, although 'Not applicable' was used where an object could not be rated. High scores (3+) indicate student consensus and thus a strength. Low scores (2 or lower) indicate an area that requires attention. Table 1 demonstrates an overall positive rating of the student experience of ERT (UJ 2020:69).

The overall mean of 3.23 is favourable, and despite the different context from the previous semester, it compares well: 3.28 percent – thus, only 0.05 percent higher. There is also a consistency in ratings, which meet the 3+ threshold which was reflected across the faculties.

Table 1: Mandatory module evaluation: Institution-wide score analysis

Question	Mean
I understood the changes made to my module when teaching and learning moved to online/remote learning.	3.28
The learning outcomes for the module are clear.	3.21
A variety of learning activities were used to help me achieve the module learning outcomes.	3.18
The assessment tasks were linked to the module outcomes.	3.32
Self-assessment activities helped me to track my learning and progress in the module.	3.17
A variety of assessment tasks were used in the module (e.g., quizzes, short exercises, paragraphs, and essays).	3.20
I can apply knowledge from this module to real world situations.	3.26
Overall mean	3.23

A review panel was constituted with five internal and two external representatives, all professors of education. The panel undertook more detailed module evaluations than those conducted by CAT, assessing the quality of the online presence of the module. Panel members were provided with moderator access to the modules online, with the requisite permission of the faculties. Evaluation was undertaken according to a set of criteria. Teaching interactions, assessments, progression through the module, and lecturer responsiveness were assayed. Although these reviews were useful, the fact that many lecturers and students had to move teaching and learning online into WhatsApp and Skype, for example, meant that these reviews had often to be tempered by consideration of parallel activities in different technological platforms.

Finally, using purposeful sampling, the panel conducted extensive interviews with individuals and groups of staff members across both academic and non-academic units, including the library, student administration, student support, fees, and finances. Each unit in the academic support services was requested to attend, all deans and vice-deans were interviewed, groups of six heads of departments from each academic department, and senior faculty administrators were interviewed. The perspectives of university managers – both academic and support – enriched these observations. The review identified a small group of notable individuals within faculties with levels of expertise and skills in online teaching and learning, who acted as 'online champions' and whose input on ERT proved invaluable. Students on representative structures were also interviewed by the panel. All student representatives who were sitting on representative structures were invited to the interview, and sessions were well attended. The directors and heads of divisions in every support unit of the university were approached for an interview and were invited to nominate staff members in their teams to attend

the interviews as well. Interviews were voluntary. Services staff (i.e. security, cleaning, and ground staff) were not interviewed.

Interviews were not done by closed 'questionnaires,' but rather by a set of open-ended questions which were posed in a space in which the interviewees' experiences were the focus. Interviewees spoke reflectively and critically, providing an overall assessment of ERT. The interviews with the staff members and students focused on programme management, teaching and learning considerations, the provision of student support, staff capacity in ERT, staff well-being, and the crucial question of assessment for ERT. The staff members were encouraged to be frank in the interviews, with the panel providing a safe space in which the challenges and frustrations as well as achievements could be noted. The interviewees indicated that this had value for the reflective nature of the exercise across 67 group and individual interviews. All interviews were recorded, and detailed notes were logged online.

The report canvassed a cross-section of quality considerations and personal experiences of teaching and learning. The process provided an outlet for staff members' experiences and judgements of the transition to ERT. Although some students were interviewed, they were not the focus of the review. The quantitative reviews which were undertaken by other divisions, were used extensively in determining the responses which were needed to the student experience. The student interactions in this review were used as part of the triangulation of the staff members' experiences. Existing qualitative and quantitative data which were obtained from surveys, were used to triangulate the inferences and conclusions that were drawn from the data which were collected for review purposes. Data sets included those that were drawn from institutional and faculty reviews, targeted module reviews, and students' evaluations of their experiences. The entire process, including the production of the report, took six weeks and addressed the reflective and evaluative goals of the review, providing insights into the period and identifying the areas of support that were needed for the undefined future.

Internal Quality Review

In most quality engagements that are already in the system (i.e., accreditation, audit, and national review), the *experiences* of the staff members are unsought, and those of students are sought in terms of what can broadly be termed 'the student experience.' The UJ evaluation attempted to balance the evaluation of the outputs of ERT (teaching and learning, assessment, student interaction, completion rates, etc.) with the experiences of support and academic staff members and students. As a result, the QA review sought input across a wide range of considerations likely to impact on staff members and students and which could in turn disrupt the timely completion of their programmes of

study. For some, especially students in their final year and students studying for professional qualifications, the pandemic and its consequences for universities placed post-programme employment or professional registration prospects at risk. As in other international cases, internships, work-integrated learning, clinical, and practical sessions were halted by measures to control the pandemic. ERT had to legitimately serve the educational need and meet the module and programme outcomes. Programmes accredited by statutory professional bodies such as the Health Professions Council of South Africa and the Engineering Council of South Africa, for example, meant that students had specific requirements to meet prior to the completion of their studies for professional registration to be granted (UJ 2020). However, the lack of access to workplaces or campuses had the potential to impact equally severely on students whose programmes contained practical sessions, such as those in the hospitality programmes and those in need of laboratory access (UJ 2020).

The CHE's view of ERT is that it was essentially an altered form of delivery using the same kinds of activities, albeit in a remote setting. How this was to be achieved was unclear and its usefulness for the *actual* transition to ERT was limited. Nonetheless, it provided a simple yardstick against which to measure UJ's successes over the period. Significantly, the CHE approved all programmes which were accredited in the contact mode for delivery in the distance mode, by announcing on 7 April 2020 that 'all higher-education qualifications registered on the National Qualifications Framework (NQF) that were previously accredited for the contact or distance mode of delivery [were to be] regarded as also accredited for the blended and online modes for the duration of the 2020 academic year' (CHE 2020:5). The accreditation 'extension' period has been extended in 2021 by an additional notice to cover the 2021 and 2022 academic years (CHE 2021). The Department of Higher Education and Training (DHET) too required reports on ERT, as well as on teaching, learning, assessment, and campus readiness plans by May 2020, and into the 2021 academic year. With Universities South Africa (USAf), DHET identified and assessed the implications for work-integrated learning, experiential learning, and practical sessions. In many cases, UJ was able to assist DHET, USAf, and CHE through providing its guidelines and documents for use across the sector.

The Transition to ERT

The time that was taken to effect changes to the mode of delivery at UJ was a significant achievement, especially as there was no framework or standard operating procedure in place for how to manage HE during a pandemic. Nonetheless, CHE (2020) made clear that universities were required to quality assure their ERT offerings for the period of full lockdown (three weeks from

26 March 2020) and the period which followed, when the academic programme proceeded with restricted campus access, providing little by way of guidance as to how best such a quality assurance project should be undertaken. UJ defined the mechanisms through which it could a) self-reflect on the period in the context of its own, and the national quality framework, and b) conduct an assessment of the extent to which ERT met the goals of 'saving' the academic year and maintaining academic standards. A mechanism for the review was approved by governance structures in June 2020.

Quality assurance, staff development, academic administration, library services, and student support, among others all needed to direct their processes and efforts at supporting the move to ERT. Like the library, these teams work directly in support of the overarching academic project. Although the division under discussion does not engage directly with students – unlike, for example, the library or student support services – the impact of its work is felt immediately on teaching and learning, a factor it shares in common with the work of units such as the library and the academic technologies division.

Globally, the pandemic saw over a billion students who were unable to attend classes in person (Mogaji & Jain 2020). UJ's senior management deliberated on how to proceed with teaching and learning, using ERT as distinct from 'online' or 'distance' education. As Nordmann, Horlin, Hutchison, Murray, Robson, Seery, & MacKay (2020) outline, 'remote' learning is different to 'distance learning' which has at its heart the assumption that the student and the teacher will be separated by time/space. The assumption that underpins distance learning, thus has at its core mechanisms to manage and traverse these spaces. Where online distance learning is used, there is a set of specific pedagogies and curricula that set out measured and impactful steps to ensure that learning is supported and effected, despite the distance between student and teacher (Smith & Hornsby 2020). ERT, however, was what UJ used for its rapid and practical approach to balancing the learning needs of its diverse student body against the urgent need to not lose an academic year (UJ 2020). Thus, the ERT approach, which is neither traditional contact learning nor traditional distance learning, proceeded from a different planning context, using non-contact teaching modalities to achieve its overall objectives. As Hodges *et al.* (2020:1) posit, '[ERT] is a way of thinking about delivery modes, methods, and media, specifically as they map to rapidly changing needs and limitations in resources.'

The inability to attend and teach in traditional in-person contexts, and the desire for social justice, gave rise to many and varied strategies to support and enable ERT, a staggering task for its almost 50,000 students, many of whom are drawn from among the poorest communities across the country. According to the Department of Basic Education, Quintile 1 schools in each

province cater for the poorest 20 percent of learners, while Quintile 5 schools cater for the least poor 20 percent of learners in the province. Quintiles 1 to 3 are no-fee schools, and their categorisation is 'according to the level of poverty in surrounding areas. The factors that they consider, include the surrounding infrastructure and how many homes in the area are made from brick, wood, iron sheeting, and so on' (SECTION 27 2017:146). For example, UJ's HEMIS data indicates that, of the 9,321 first time entering students in 2020, 5,274 were drawn from Quintiles 1, 2, and 3 schools.

Notwithstanding the fact that only a few students had access to the resources – technological or otherwise – that were needed to effect ERT, the university was able to very rapidly give effect to its ERT. Access to ERT was dependent on appropriate technology, bandwidth, data, and network coverage. These four aspects of access to teaching and learning are curtailed by the 'digital divide,' which is defined as the 'gap between those who do and those who do not have access to new forms of information technology' (Van Dijk 2006). Characterised by the United Nations (2021) as the potential new face of inequality, especially in light of the pandemic, this divide poses significant challenges to the UJ students and staff members.

Added to the social and economic issues – such as food insecurity, living conditions, and gender-based violence – which were already confronting UJ students, both students and staff members reported that they were feeling harrowed and anxious during the period between March and July 2020 (UJ 2020:84-86). Motala and Menon (2020) discuss how the inherent social inequality in South Africa made the challenges of ERT yet more difficult and contend that many of the modalities that were developed by universities to move teaching and learning online, operated from an expectation of access to the very resources that were not in place for the majority of South African students.

A detailed account of how this translated at both governance and academic levels is set out in Motala and Menon (2020:87), which include the following:

- Revising the academic calendar.
- Developing guides and toolkits for staff members and students to implement ERT.
- A week-long student orientation on remotely learning to use Bb.
- Revising modules to consider the deferring of practicals, laboratory sessions, or clinical training.
- Assessing which modules were online and how best to transition all undergraduate modules for Semester 1.
- Revising assessment for remote learning.

- There were no summative assessments for the first two weeks to allow students time to settle.
- Ensuring that all academic changes to modules, including assessments were submitted through faculty governance structures and to senate.

The UJ Context

In its 15 years as a merged institution, UJ has focused on developing its research and teaching as a successful comprehensive university in Africa with a reputation for excellence. UJ's strategic plan to achieve global excellence and stature, provided a cohesive approach to developing institutional measures, structures, and functions, and has had considerable successes which permeated the institution's pandemic response. The creation of an enabling environment for ERT required governance, reporting, and communication, and all UJ structures were focused on this. The weekly updates from the Vice-Chancellor on the UJ COVID-19 webpage provided (and is still providing) a chronicle of activities and the unfolding of events. Online training and support were provided by both CAT and the library, as the Library App took its functions online. Governance structures for COVID-19 were established and steered decision-making. The 2020 academic calendar was rapidly revised and distributed, and ERT commenced on 20 April 2020, with targeted documents guiding students and staff members.

Unlike, for example, UNISA, UJ is a contact university, and lecturers and students alike are accustomed to interacting in face-to-face classroom sessions and other settings. The speed of the transition to ERT was challenging, specifically because the distance mode was not one with which the majority was familiar (UJ 2020:21). Added to this, removed from campus, lecturers and students immediately had to perform all academic duties from their homes, without access to the physical support resources ordinarily available on campus. Lecturers report that having to perform academically from their homes, while under lockdown, with family and other responsibilities, added to the already difficult challenges of interacting with students. Many lecturers had to rapidly acquire the skills needed to navigate the online environment, adapting their interactions and assessment as required. As Kupe notes, '[T]he very essence of pedagogy – the shared trust between teacher and learner – [had] been corroded by the imperative of social distancing' (Kupe 2020:1), as teaching and learning was forcibly 'decentralized into students' own homes' (Williamson, Eynon, & Potter 2020:108).

UJ's comprehensive status means that it offers a wide variety of programmes from higher certificates on NQF level 5 to doctorates on NQF level 10, demanding a wide range of knowledge and skills not only from lecturers,

but also from support services such as the library and the quality team. Table 2 sets out the enrolment patterns at the university (UJ 2020:13).

Table 2: Headcount enrolments

Registrations	Faculty	2020
Postgraduate	College of Business and Economics	2,983
	Faculty of Education	1,210
	Faculty of Art, Design and Architecture	259
	Faculty of Engineering and the Built Environment	1,902
	Faculty of Health Sciences	1,217
	Faculty of Humanities	1,062
	Faculty of Law	202
	Faculty of Science	1,005
Postgraduate Total		**9,840**
Undergraduate	College of Business and Economics	14,815
	Faculty of Education	3,095
	Faculty of Art, Design and Architecture	1,066
	Faculty of Engineering and the Built Environment	6,946
	Faculty of Health Sciences	2,888
	Faculty of Humanities	4,543
	Faculty of Law	1,534
	Faculty of Science	3,867
Undergraduate Total		**38,754**
Grand Total		**48,594**

The extent of interventions and controls needed to manage the transition can be discerned from Table 2, as well as from Table 3, which provides a breakdown of the number of staff members to students, as well as the registration patterns (UJ 2020:13).

Approximately 30 percent of undergraduate programmes require work-integrated learning, practical sessions, or some form of experiential learning as part of their studies, a factor that had to be considered by the staff members as they were planning and preparing for teaching. The lack of access to campus facilities made these types of in-person teaching and learning engagements impossible. In some cases, lecturers were able to adjust by using online simulations, videos, or the like. In other cases, however, students and staff members had to wait for the facilities to reopen.

Table 3: Summary enrolment data (31 October 2020)

Headcounts	Total
Number of headcount undergraduate students registered in 2020	39,375
Number of headcount undergraduate students that deregistered in 2020 (cumulative)	617
Number of remaining undergraduate headcount registered students	38,758
Total number of course (module) enrolments taken by undergraduate students enrolled in 2020	288,718
Number of headcount postgraduate students registered in 2020	10,134
Number of headcount postgraduate students that deregistered in 2020 (cumulative)	314
Number of remaining postgraduate headcount registered students	9,820
Number of permanent staff members in 2020	3,992
Number of permanent instruction/research (academic) staff members in 2020	1,094

QA in a Crisis

Given the scope of UJ's offerings and the newness of ERT, the review was designed to allow for a frank evaluation, recognising the extreme demands that the situation placed on all who are concerned and being cognisant of the perception that QA is a bureaucratic burden which is imposed by either management or an external QA body (Seyfried & Pohlenz 2018:259).

Of course, South Africa is not unique in this experience, and universities across the world grappled with the importance of institutional innovation and resilience. From Malaysia (Abdullah, Husin, & Haider 2020), to the United States (Schlesselman 2020) to countries in Africa (Affouneh, Salha, & Khlaif 2020), academics and administrators sought to acquire and transfer the resources and capacity which were needed to enable the remote teaching and learning process. Czerniewicz, Agherdien, Badenhorst, Belluigi, Chambers, Chili, De Villiers, Felix, Gachago, Gokhale, & Ivala (2020) demonstrate how the pandemic exacerbated three forms of inequality in South Africa: Vital inequality, resource inequality, and existential inequality, and how this spanned the university sector in South Arica. The three inequalities are both shaped by, and are shaping the 'nexus of mutually constitutive factors such as gender, culture, race, class and geopolitical context' in constant flux (Czerniewicz *et al*. 2020:948). For UJ, these factors were at the core of the development of a humanising pedagogy, fit for the purpose of ERT. The process of pivoting to ERT, signalled a university coming to terms with a pandemic pedagogy which retains the student as an active participant in teaching and learning, taking context into account – in the words of Smith and Hornsby

(2020:6), 'Compassion and flexibility in our classroom needs to be a hallmark of pandemic pedagogy.'

In assessing the success of the ERT project and its impact on the staff members and students, the review sought to identify areas of good practice across the university, as well as those areas where additional support was needed. The latter focus was especially important given the lack of clarity on the trajectory of the pandemic, and which now, in the third wave, is still impacting on significant areas of the university's operations, restricting class sizes, impacting on the timetable, and requiring additional work and often repeat sessions from the academic staff.

UJ's transition to ERT was successful, at least in part, due to the fitness for purpose of structures, initiatives, and activities which were already in place prior to the start of the pandemic. As mentioned above, fitness of purpose and fitness for purpose are two quality principles of the HEQC/CHE (HEQC 2001). With regard to fitness of purpose, the intention was to assess and review UJ's transition to ERT and whether it was appropriate for the specific conditions of teaching and learning in South Africa. The key question in considering fitness for purpose is whether ERT was met at an appropriate level and with the required support, taking into account the needs of the students.

In line with its commitment to enhancing teaching and learning, several initiatives which were already in place, provided a sound basis from which ERT developed at a rapid speed. UJ's commitment to blended learning (Strategic Plan 2025) (UJ 2018) led to the implementation in 2019 of structures and support mechanisms which were needed for student success. First, at the start of the pandemic in South Africa in early 2020, over 300 programmes were already in blended format with a defined process in place to expand the adoption of blended learning.

Second, the first-year experience and the Integrated Student Success Initiative (ISSI), in combination with accredited and integrated tutor training and support, had significant positive effects on student success. ISSI uses data to plan and respond to student needs which are prioritised by faculties and the Academic Development Centre. Semester 1 of 2020 saw 43 interventions, with ERT ensuring that additional initiatives which were already underway, were speedily optimised.

Third, UJ has also consistently invested in CAT, of which the advantages were evident in the circulation of its contingency plan for ERT in early March 2020, meaning that even before the lockdown was announced, CAT and the faculties had already implemented many of the practices which were essential to make ERT successful. For example, most undergraduate students already used Bb as part of the first-year programme which introduces all students to learning in this environment. CAT instructional designers (IDs) are allocated

to each faculty, and at the beginning of the year had engaged with every department in UJ, devising customisable Bb templates for modules. By the time of lockdown, 96 percent of undergraduate modules were on Bb with the balance having to be created in March. CAT speedily developed, designed, and loaded a Bb module for staff members on ERT, and another for students. Extensive help was provided to all from a dedicated helpdesk and in targeted e-mails, Bb, and other forms of communication.

The active tracking of student activities was the final initiative, making it possible for UJ to know at any given point how many of its students were online, what device/s they were using to interact with the university, and on which activities they were most/least active. CAT tracked student and staff activities on Bb and, by the second half of semester 1, 85 percent of the undergraduate student body was active on Bb. Once data had been distributed, all but 350 students were online. Students who were not online, were contacted individually and, in each case, attempts were made to understand the contextual factors that were limiting their access and aided in addressing it. The distribution of 4,000 laptops to students (in addition to the 1,740 devices which were already provided to National Student Financial Aid Scheme recipients) served to enable access to teaching and learning. Pastoral, technological, pedagogical, and assessment support was also available to students and staff members.

Staff Experiences of ERT

The review captured staff members' experiences, an uncommon inclusion in a QA review, keeping in mind the differences in disciplines, teaching styles, and circumstances. A clear set of common motifs emerged from this input as can be seen below, taken from interviews held with participants in the review.

Time and time pressures came out strongly in the feedback that was obtained in the reviews, as many of the staff members reported having to work quickly on their preparations while also learning to transition to ERT. Typical comments to this effect refer to '*intense pressure*.'[1] '*extra work*,' and a move that was both '*fascinating and nerve-wrecking*.' While some staff members were familiar with Bb, others were less so. Those who were already familiar with Bb reported a '*good head start*,' with some of them who were already using continuous assessment. Many of the staff members were already working on accredited degrees in the online mode and their '*experience and enthusiasm*' provided much-needed support, in a '*collegial*' and '*collaborative*' environment. Nonetheless, everyone felt the enormous time pressure, with one staff member commenting, '*now we were supposed to do it overnight*.'

1 Comments from interviewees which were obtained from interviews that were held in the review, are indicated in inverted commas and italics.

The increased workload meant that both teaching and administrative staff were reliant on their line managers for communications and direction, as the university made and effected rapid decisions in a wide range of areas. The communication strategy of the university was intensified to ensure a two-way communication to inform decision-making (cf. Motala & Menon 2020). Many interviewees in management positions reported that they were feeling particularly besieged over this time, having to manage increased demands on their own work, as well as monitoring, managing, and supporting the work of those who were reporting to them. In addition to the staff members who were working long hours and experiencing fatigue and stress, many had to juggle work with other demands: '*There is literally no time when you are not doing UJ work*;' '*My life is a computer – since the online move. I'm on the laptop all day… almost 24 hours on the computer*.'

Lecturers reported that they were coping due to the support that was offered by the various support services, with students being directed to CAT, the library, psychological services, and the academic development centre for assistance. Although additional monitoring and administration demands added to the strain, lecturers were intent on the task at hand, doing their best to keep the academic year on track. For those who were already steeped in the online mode, the requisite pedagogy was already in place, which was evident in module reviews being undertaken by the panel. Data and connectivity constraints pushed lecturers to find ways to ensure '*socially just and highly inclusive teaching*,' with lecturers who were often being '*[p]ushed out of necessity to be mindful of the need for that*.'

A small number of interviewees expressed an aversion to ERT, in a blend of personal and professional identities related to what their sense of being an educator in a university should be. The classroom in an online setting is no longer as private a space as in the physical realm. In some cases, the reasons for the preference for traditional contact environments related to the discipline being taught. For example, in teaching students to be teachers, 'modelling' is used to provide trainee teachers with the skills that are needed to teach children. Given that for most children this will not be online, many found it '*particularly difficult to adjust to not having faces/bodies to teach*.' Some lecturers spoke about missing '*students, looking at their reactions, having fully informed conversation with one-to-one or one to a group*' and of '*teaching people you can see and interact with physically*.'

Another obvious result of the transition that was reported by both students and staff members was anxiety, exacerbated by an inconsistent electricity supply and a lack of cellular connectivity. Heads of departments reported that their staff members were fatigued and exhausted, continuing to perform under a bombardment of student communications, driven by

fear. Increased communication, although necessary, and multiple online meetings added to the stress. Support services staff too took strain as they worked alongside the academic staff, providing assistance and addressing student queries from home. The increase in the volume of work can be seen from one example – the ticket count in Table 4 which notes the number of queries logged with the CAT helpdesk between March and June 2020. Although the helpdesk was meant to address the students' and staff members' concerns about using Bb, it became a 'one stop shop,' with the staff members either responding to, forwarding, or referring queries across the range of issues. Queries which were received, included academic and administrative queries, which were forwarded to faculties, library access queries, fees queries, and so on. The majority related to questions of '*how to*' manage ERT. The key point, however, is the increase in the volume of work for the staff members on the helpdesk – from 593 queries in the month of March to 3,739 queries in the month of April, a more than sixfold increase (UJ 2020:27).

Table 4: Number of helpdesk queries

Month	Number of tickets/ queries dealt with
March 2020	593
April 2020	3,739
May 2020	3,545
June 2020	2,580
Total	**10,457**

In addition to the challenge relating to time and workload pressure, students and staff members struggled with connectivity. Both the rural and urban areas were problematic, which resulted in lecturers having to make use of any platform that made it possible to teach via Bb, WhatsApp, and even e-mail. Although Bb is the university's official platform, it is data intensive and finding creative alternatives drove much of the teaching: '*Bb is harder to connect to than e-mail*' or WhatsApp. Although it is very efficient, in that voice messages, documents, and videos can be easily distributed, WhatsApp meant that students had access to lecturers' telephone numbers. A few reports of '*inappropriate content*' and '*invasions of lecturers' privacy*' were received. The allocation of 'night owl data' meant that many students sent messages after hours. Three lecturers who were interviewed, reported that they were teaching after midnight to respond to student queries.

Technology was another constraint. Students have a variety of devices – from cell phones to tablets to laptops – but not all are able to run the software being required for their studies, resulting in alternative activities

having to be devised, including the use of simulation software and online educational gaming (where available), YouTube videos, etc. The suitability and appropriateness of devices are clearly programme-specific, and their implications for ERT have been addressed in 2021 with either access to computer laboratories, campus, and library facilities being managed to permit for use, or more suitable technology being provided to students in need. Finally, large classes were especially challenging, and lecturers would not have coped without the trained tutors.

Was ERT a Success?

In open-ended interviews and in response to the question, 'How successful can ERT be said to have been?' lecturers agreed: ERT has worked to save the academic year. Responses were overall in the positive, with comments ranging from '*highly successful*' to '*relatively successful*' and '*fairly successful*,' to '*It's not a score – it has happened – we did it!*' Not one comment was received which indicated that it had been a failure, or that it had not achieved its goal. Although responses as to how successful ERT was, varied, and taking the circumstances into consideration, lecturers commented, '*By any metric, not just student performance, this has been a success*,' and '*We could have done it better, but we have done it better than other universities*.' Interestingly, both staff members and students who were interviewed, commented that an increased trust in the staff members appeared among students, with one lecturer commenting that '*the students trust us – we are not going to do them in. As far as possible we will do what is in their best interest*.'

Linked to the above, there were mixed responses to working from home as lecturers managed multiple roles – household chores and home-schooling jostled for space alongside teaching, marking, and research. Many noted the flexibility of working from home with better time management. Interestingly, lecturers reported that they were feeling more connected to students, '*freed from the peer pressure…in the physical classroom*,' and '*[i]n the online environment, students were more forthcoming, more brave. In the discussion board, they asked questions*.' Some students took the opportunity to explore other readings, taking initiative, and undertaking additional research. For lecturers with repeat classes, ERT '*saved on work and allowed greater focus on better assessment*.'

Most significant was the adjustment to lecturers' assessments of what constitutes good pedagogical practice. The majority of interviewees concurred with the view that the use of the online platforms was useful and committed to the use of blended learning in future. One lecturer's comment is particularly telling: '*When the university resumes, I will continue to use the online because it serves to get our students together – some are outside the country – it's easy for*

them to meet because we meet at night – better for working students – helps to do PG supervision.' Another one remarked: '*I believe that I learned as much as the students did. They taught me things and we learned together, which ended up being fun in the end*,' while another prosaically commented, '*We cannot replace face-to-face teaching – no doubt about it – but the online has saved us and the students the year.*'

A consistent thread has been the demands which were placed on staff members across UJ who worked hard and long hours to support students. Students were anxious, needing '*quick answers*' and '*24/7 availability, partly because night-time data is cheaper.*' Students responded gratefully to the support which they received, while active staff collaboration and flexibility in dealing with students enabled greater engagement and participation. Without underplaying the challenges, new opportunities for professional growth emerged as lecturers, tutors, IDs, and support staff collaborated, as well as opportunities for students who demonstrated remarkable responsiveness and engagement. Students went to great lengths to connect and stay connected: '*Students were insistent that "they did not want to be left behind".*' They appeared to be '*spending more time [on their work]*' and the quality of work was often higher. ERT resulted, for many, in '*on demand content*' and '*flexibility, maybe also in the curriculum.*'

For staff members and students alike, however, the isolation was difficult, and the stress a burden, while ERT offered an opportunity to sustain some of the relationships and activities that characterised their daily lives. One student noted: '*I miss my social gatherings at UJ – lecturers, book discussions, I miss conversation and the VC's book thing, I miss the girls from the residences.*' Commenting on the impact of the pandemic on the disruption of these moments, a staff member noted that a university is '*a space where people meet – without which the idea of a university would disappear rapidly. Lockdown has shown the importance and value of a meeting space such as the university.*'

Overall, lecturers reported no substantive amendments to curricula, but numerous modifications to pedagogy. Lecturers and IDs reported a new focus on interactivity and '*prompt interactions.*' Seeing students in their homes appears positively to have influenced lecturer engagements with students: '*I used to just leave lectures, now I'm more there for students,*' and '*[it's] really important to have feedback loops with students: Make sure that students enjoy, understand.*' Creativity in teaching came to the fore, as staff members were forced to '*try things, new methods, new media*' which '*added value and led to exciting new creative ways. Staff members are learning to make learning more fun.*' ERT '*spurred us to reflect…on our own knowledge and abilities and teaching processes and strategies.*' Attendance at weekly master classes and other platforms at which pedagogy and curriculum enhancement are shared, is evidence of a

massively increased interest in developing new skills and collaborating with other academics across fields to improve teaching and learning. The Division for Academic Planning, Quality Promotion and Academic Staff Development collects data on staff attendance at training and other developmental events. By way of illustration, in 2019 staff development workshops would attract between 25 and 30 participants, while in 2020, at the height of the pandemic, attendance exceeded 100 per session.

Lecturers reported that they were thinking more deeply about assessment, particularly in assessing applied skills. The time impact was significant as time for assessments had to be increased and more time was spent on setting and marking assessments. Monitoring student progress '*became more demanding as academic progress was infused with personal issues as never before*.' An increased risk in ERT was students' academic misconduct. There was little consensus about its prevalence across responses from lecturers and students, and evidence regarding it has as yet to be collated. Lecturers' responses varied. Some indicated that '*students were found to be quick to use excuses, difficult to verify*,' students '*claimed problems with connectivity*,' '*copied from external sources*,' and sought '*assistance from other people*.' However, some lecturers stated that most students '*were honest without having to be told*.' External examination took place as required, despite logistical issues. As one HOD noted, ERT '*[a]ssessment must be rethought very carefully*.'

One unanticipated result of ERT was the development of some invaluable assets: '*Instructional videos that we created were really useful. We will continue to use these even after things turn back to "normal"*,' '*people [had] to think more innovatively and this leads to interesting solutions to problems*,' '*a complete revision of the kind of material and how it is taught*,' and "*it's forced us to learn new technologies that can be integrated in future*.' UJ's staff demonstrated extraordinary resourcefulness and a willingness to 'go the extra mile.' Although the advantages of blended teaching have not outweighed the preference for face-to-face contact, ERT provided a lens for critical reflection on pedagogy. As discussed above, staff members are doing active research to develop new online skills across a range of platforms extending beyond WhatsApp and Skype and into other downloadable packages. Attendance at staff development sessions held online has made for an increased awareness and interest across the university.

Conclusion: Balancing Quality and Pragmatism

COVID-19 has imposed and deepened many of the existing inequalities in HE and made responding to these inequalities more urgent for the academic programme to continue. To assess this aspect in detail, more research into assessment and practical work is needed. Social justice is a key principle

for UJ, and many measures were taken to provide students in need not only with devices and data, but also with food parcels and access to support. Nonetheless, systemic inequality worked against the desire to complete the academic year and to not disadvantage students further. Also of concern were disruptions to the professional and work-integrated learning components. Guidelines for these were prepared, and each faculty, together with DHET, professional bodies, and industry developed strategies to cope. The impacts on those students, needing to meet professional registration requirements, were potentially significant, and UJ extended the academic year and engaged with professional bodies to resolve as many of these issues as possible. Either way, the theory that was acquired online will still need to be integrated with practical experience. In some disciplines there was no solution other than to wait – a phenomenon not characteristic to UJ. The effective management of practical-based learning is essential for graduating students to transition to employment.

The findings from the review of UJ's transition to ERT as a result of the pandemic, have been presented, and highlight the complex terrain which both staff members and students navigated to save the academic year. Strong staff cohesion and a responsive and inclusive academic management created an inclusive teaching environment. This inclusive approach is invaluable, as students with disabilities and other barriers to learning are already in a vulnerable relationship with HE. The ERT module development appears to have resulted in a thorough interrogation of how module content serves module purpose. The UJ ERT experience suggests that lecturers build stronger personal connections with students and demonstrate greater empathy for their circumstances after being exposed to these first-hand, getting to know students who would not usually participate in classes, and understanding the factors that impacted on the completion of tasks. Other unexpected advantages for further investigation include new scholarships of teaching and learning, how to define excellence, integrating rurality and students' experiences into the curriculum, and systems of ERT delivery beyond Bb.

The brief for the review was to provide for reflection on the transition to ERT and was primarily developmental, designed to identify how the university can enhance quality. The review used both quantitative and qualitative data, providing university staff members with the opportunity to reflect on and share their experiences. In assessing the effectiveness of ERT, it is necessary to address its goal: To maintain the academic year wherever possible. By this measure, ERT was successful. UJ's response was high level, thorough, and considered, and its infrastructure and management team showed itself to be resilient and agile. The existing experience in blended learning, collegial relationships, and training and support created a productive environment in which to address the interests of the students. The transition to ERT was

radical and disruptive, but the university retained its focus on social justice, going to extraordinary lengths to redress inequality within the realms of possibility. The distribution of laptops and other devices and data, the gradual return of students to accommodation where circumstances were not conducive to teaching and learning, and the provision of food parcels to students in proximity to the university are just some examples.

The university had an enhanced awareness of the challenges that students had to face, resulting from a deepened understanding of students' everyday circumstances and the factors that were hindering their participation in ERT. UJ's deeply student-centred approach hinges on the belief that the institution had an opportunity to entrench existing, successful interventions and pilot others that could form part of its long-term strategic vision for the 4IR, with the focus on avoiding the deepening of 'social exclusion and inequity…with the distinctions between advantaged and disadvantaged students determining access to learning in yet unprecedented ways' (Motala & Menon 2020:93).

Expanded research into students' circumstances and experiences, staff training on curriculum design and pedagogy, and a focus on integrated assessment are needed. Particular attention needs to be paid to first-year students' experiences and to the management of large classes. ERT is neither cheaper nor easier than face-to-face teaching, and often impacted negatively on the staff members' workload. That said, UJ's ERT exceeds the CHE's characterisation of it as 'a temporary solution mirroring normal activities – the study of text, primarily the textbook, attending (digital) lectures and attending (digital) tutorials' (CHE 2020:5). The future, though fraught with uncertainty, will require the university to continue to draw on pedagogies which are rooted in social justice and compassion. Drawing on lessons from the pandemic, university pedagogies have, more than ever before, to derive first principles from a clear commitment to successful and effective teaching and learning, grounded equally in equity and excellence. Globally, there is consensus that there are intractable problems that are pervasive in HE and the society. The pandemic exacerbated these fault lines. The review clearly demonstrated that UJ was able to drive an ERT strategy which presented the opportunity for the academic year to be saved.

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From Online Learning to Digital Transformation

The New University Normal

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Abstract

The advent of the worldwide web and progress in the information and communication technologies in the 1990s have boosted online learning and the use of digital platforms. The transformation of the web from a repository of hypertext documents to a highly interactive communication medium, accompanied by a shift in learning theory from the traditional educational theory of behaviourism to that of cognitivism and constructivism supported by technology and tools such as digital libraries, has immensely contributed to the effectiveness of online learning, the benefits of which are now unchallenged. The adoption of online learning requires a well-structured approach and continuous adaptation to a fast-changing environment. This chapter expands on the University of Mauritius' experience in moving from distance education to online delivery through the training of staff and investment in infrastructure, in particular stressing the role played by the Centre for Innovative and Lifelong Learning, the Centre for Information Technology and Systems, and the digital library in that transformation, in addition to the quality assurance mechanisms which are put in place.

In these early days of the Fourth Industrial Revolution, with fast progress in artificial intelligence and data science, it becomes imperative for universities to now move a step further by embracing digital transformation as a series of deep and coordinated cultural, workforce, and technological shifts for enhanced operations and strategic directions, and valuing propositions. Libraries have a key role to play in supporting universities in this transformation phase. The e-library is no longer the endpoint, as librarians should move from the knowledge of collection to the knowledge of the users.

Keywords: Online learning; e-library; online delivery; digital transformation; University of Mauritius

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Introduction

The COVID-19 pandemic and the confinements imposed by countries all over the world as from March 2020, constrained schools, colleges, and universities to shift to online learning to mitigate school disruption. This fast move to the use of digital platforms, video conference tools, and online learning software was made possible thanks to the relative maturity of the education technology sector which reached global investments of US$18.66 billion in 2019 (Markets Insider 2020). However, we should go back to the past three decades when online learning experienced a boost with the advent of the worldwide web and progress in the information and communication technologies in the 1990s. Even after 30 years, important disparities exist in the adoption of e-learning across regions in the developed and developing worlds because of a lack of equipment and training, inadequate infrastructure, poor internet due to insufficient bandwidth, and unreliable electricity provision. This non-uniform distribution of e-learning is also explained by the fact that many educators raised doubts about the quality and benefits of this delivery mode. The challenge to use online learning in the experimental and medical sciences has also been a deterrent to its widespread application. With universities in most countries still affected by the pandemic and even those who allege to be COVID-19 safe having started the new academic year 2020-2021 on online and blended learning modes, it appears that e-learning is set to last and could facilitate operations in the new university normal. Is the pandemic a blessing in disguise for the education sector and can it bring about that paradigm shift from traditional education based solely on knowledge to one imparting both knowledge and skills in line with the requirements of our 21st-century society? Can this digital transformation go beyond processes, technology, and tools, and embrace people? Already in 2006, experts were referring to the perfect e-storm where online learning environments were facing the fact of involving pedagogy, technology, and learner needs (Bonk 2004; Kim, Bonk, & Zeng 2005; Kim & Bonk 2006).

This chapter will review the evolution of e-learning and educational technologies over the past 30 years, the benefits of online-learning, the impact on students, and the challenges and opportunities ahead. It will also provide an overview of the progress made at the University of Mauritius (UoM), moving from distance education in the 1990s to online and blended learning and the adoption of the learner-centred credit system in 2019. Reference will be made to the required staff training and infrastructure developments, including the development of the e-library. Information on how these developments set the pillars for a robust, modern university, enabling UoM's transition into the 'new normal,' will be shared.

Evolution of Online Learning since the 1990s

The advent of the worldwide web in 1991 triggered the expansion and growth of online teaching and learning (Kentnor 2015:21-34). Indeed, online learning is the application of information and communication technologies (ICT) and electronic media in education in its various forms, like multimedia learning, technology-enhanced learning, computer-aided instruction, web-based training, and m-learning, to enhance and/or support learning. It can be divided into different types: Web-supplemented courses focussed on classroom-based teaching that include elements such as putting a course outline and lecture notes online, the use of e-mail, and links to online resources. Web-dependent courses require students to use the internet for online discussions, assessment, or online project/collaborative work (OECD 2005).

Online education can be categorised as 1) university-based online education targeting university students enrolled for a degree programme; and 2) massive open online courses (MOOCs), whose users are self-motivated individuals and whose programmes are based on their learning goals, prior knowledge and skills, and similar interests (Sun & Chen 2016:161).

Beyond the mere application of technology, two major landmarks in the evolution of e-learning can be noted. The first is the transformation of the web from a repository of hypertext documents to a highly interactive communication medium, and the second is a shift in learning theory from the traditional educational theory of behaviourism to that of cognitivism and constructivism (Chukwunonso, Ibrahim, Selamat, Idama, & Gadzama 2013:7). Face-to-face teaching and learning have been criticised for encouraging passive learning, ignoring individual differences and needs of the learners, and not paying attention to problem solving and critical thinking (Appana 2008:6).

In the 2000s, online-learning experienced a boost as businesses invested in the training of their employees to enhance their skill sets. Online learning platforms that have emerged in the market are Udemy, Coursera, Lynda, Skillshare, and Udacity. Coursera provides access to university courses. Learning how to learn, critical thinking, and communication are amongst the most popular online courses as they fulfil the need for developing the skills of today and tomorrow (Coursera 2020).

Benefits of Online Learning

In the early phases, online learning suffered a plethora of criticism such as the difficulty to extend it to all courses and to solve difficult teaching and learning problems (Conlon 1997:36-37), the limited understanding of how many students and instructors need to know how to successfully participate,

using information and communication technology (Brandt 1996), the changing nature of technology, the complexity of networked systems, reduced standards, and even devaluated university degrees (Gallick 1998).

However, over the years the benefits of online learning from the perspectives of the students, the instructors, and the organisation have been acknowledged (OECD 2005; Appana 2008; Hitz & Turnoff 2005:60-62; Van Popta, Kral, Camp, Martens, & Simons 2017:24-34). From a student's perspective, several key benefits can be given: 1) Wider access to education; 2) enhanced flexibility to reconcile learning with the demands of work and family; 3) greater student-student and student-educator interaction and collaboration; 4) self-paced learning and independent problem solving by learners; 5) the possibility to acquire ICT knowledge and simultaneously develop ICT skills; 6) online or blended courses resulting in better learning effectiveness than face-to-face courses; and 7) students who can now enrol on international courses and develop collaborative work. The value to the instructors is that they are now able to treat all students equally, and to prepare and deliver the material of the course as a single entity.

To Säljö (2010:53), technology goes beyond merely supporting learning: Technology alters 'how we learn and how we come to interpret learning' where there is interdependency between what we learn and through what medium we learn. However, a word of caution is warranted here as other variables also come into play for successful learning such as the commitment and engagement of students, how the group is participating in the class, and interaction with educators/mentors (Sternberg & Preiss 2005:xiii-xxi; Toyama 2011).

In addition to those benefits, the organisations can engage in partnerships with other international institutions, benefitting both from educational and economic perspectives. Through the development of joint programmes, costs can be shared and strategic as well as financial risks reduced (Appana 2008:18).

Improving Online Education Effectiveness

For the past two decades, educational researchers from diverse disciplines have been trying to identify the success factors of learning with digital media in higher education (Mothibi 2015; Stepanyan, Littlejohn, & Margaryan 2013; Volery & Lord 2000). Studies have shown that effective online learning is dependent on three major factors (Sun & Chen 2016:161-169; Roddy, Amiet, Chung, Holt, Shaw, McKenzie, Garivaldis, Lodge, & Mundy 2017:2-3; Means, Toyama, Murphy, Bakia, & Jones 2009:3-6):

- The competencies of the instructor, including communication skills, technological competencies, the provision of informative feedback,

administrative skills, responsiveness, monitoring learning, providing student support in line with the Technological Pedagogical Content Knowledge model which promotes the integration of technology, content knowledge, and pedagogy (Mishra & Koehler 2006:61-64).

- Types and quality of student engagement: In asynchronous modes of communication, learner-to-content, learner-to-instructor, and learner-to-learner interactions are crucial (Bolliger & Martindale 2004:62). This has also been classfied as social presence (Kehrwald 2008:91; Swan, Garrison, & Richardson 2009:47). Proactiveness, a self-directed approach on the part of students, and self-regulated learning (Khiat 2015; Kirmizi 2015:133-134) lead to better performance. Active engagement in academic material with instructors and peers has proved to be very effective for students (Dixson 2012:7-9). Providing effective communication and interaction is a key element in online learning. To enhance active learning, it is important to incorporate meaningful and multiple ways of interacting with students and encouraging/requiring students to interact with each other. A variety of formats are available for online interaction, but they may have to be adapted to the particular pedagogy used by instructors to enhance critical thinking (Roddy *et al*. 2017:3).
- Institutional support to the students is also crucial: Orientation services, library resources, technological requirements, and access to online tools (Roddy *et al*. 2017:5-7; Means *et al*. 2009; Mishra & Koehler 2006:62; Bolliger & Martindale 2004:65; Kehrwald 2008:99; Khiat 2015; Ludwig-Hardman & Dunlap 2003). The digital library as opposed to the traditional library is not only a provider of information but also ensures a conducive learning environment and resources network for e-learning (Sharifabadi 2006). The Bibliotheca Alexandrina in Egypt is a vivid example of the wide range of support that digital libraries can provide to enhance online learning (Abumandour 2020:184-185).

Well-designed course content and the creation of a sense of an online learning community also promote online learning (Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Liu 2006:116; Yuan & Kim 2014:221-222). Assessing the use of digital learning environments in higher education with regards to learning outcomes is important to evaluate learning success (Kümmel, Moskaliuk, Cress, & Kimmerle 2020:5). Over and above the advantages of offering courses online rather than a traditional face-to-face delivery, the enhanced effectiveness of the blended approach is more and more acknowledged by the educational community as it promotes learner satisfaction while it also helps to better achieve learning outcomes (Lim, Morris, & Kupritz 2007:815). Other advantages of blended instruction include improved pedagogy, easy access to knowledge, more interaction among learners, personal presence,

cost effectiveness, and ease of revision of learning content (Osguthorpe & Graham 2003:231).

From Distance Education to Online Delivery: The UoM Experience

Founded in 1965, the UoM is the oldest university in Mauritius, with seven faculties and a student population of 10,000 at undergraduate and postgraduate levels. Since 2017, the vision of the UoM is to develop into a research engaged and entrepreneurial university.

The UoM started exploring alternative modes of educational delivery in the early 1990s, just after the setting up of the office of Distance Education and Curriculum Development (UoM 1994:23-24). The Centre for Extra Mural Studies (CEMS) was created, and its immediate objective was to identify modules that were being offered through different faculties, including large cohort year 1 modules such as IT, Communication Skills, and Mathematics, offering it in distance education (DE) mode. The mode of delivery was mostly print-based where students were learning on their own and met into smaller groups for tutorials to work on activities and to discuss relevant issues (UoM 1997:50). This was an early model of the flipped classroom. In the early 1990s, this represented a major milestone for the UoM and the academic community.

Since 1993, the UoM never looked back again in terms of DE and online learning. A number of initiatives and reforms, initiated over the following 25 years, have changed the culture of teaching and learning at the UoM.

In 1996, the name of CEMS was changed to Centre for Distance Learning (CDL) (UoM 1997:50), and the first instructional designer of the UoM was recruited. In 2001, the VCILT (Virtual Centre for Innovative Learning Technologies) was set up, specialising in online learning (UoM 2001:73). In 2003, to optimise resources of CDL and the VCILT, the Lifelong Learning Cluster (LLC) was created to act as a virtual structure that gave the centres the same powers as a faculty to offer programmes through an academic board (UoM 2004:83). Through the LLC, both centres would start designing full-fledged programmes on DE/online and blended learning modes, as opposed to just offering modules as a service to other faculties.

Through these modes of delivery, the market for lifelong learning/lifelong learners and commissioned courses for the industry could then be explored. In 2005, CDL was again renamed, this time to CPDL (Centre for Professional Development and Lifelong Learning) to reflect the new direction (UoM 2005:71). Programmes for civil servants, cadres in the port sector, and police officers were launched. Through these programmes, the centres started to have spill-over effects which influenced the faculties. These programmes were developed by faculty members in different faculties who were accompanied by an instructional designer, and they would thus be groomed in DE and

online learning. With time, the faculty members became autonomous content developers of self-instructional material. The VCILT projects with the Virtual University for Small States of the Commonwealth and the Commonwealth of Learning (UoM 2007:3), were also trying to bring about the open educational resources mindset and the use of open educational resources.

In 2014, VCILT and CPDL merged to become the Centre for Innovative and Lifelong Learning (CILL) which acts as a one-stop shop for the design and development of modules and programmes for lifelong learners, using innovative modes of teaching and learning. CILL is now aggressively launching online/blended learning programmes and has as clients the Mauritius Police Force, Mauritius Export Association (representing import and export companies in Mauritius), the Mauritius Ports Authority, and insurance companies.

With these different programmes, CILL continues to recruit researchers from the different faculties as content experts and hence immersing more and more academic staff into the online/blended learning philosophy (learner centredness, flipped classroom, innovative modes of assessment, use of learning management systems [LMSs], and accreditation of prior learning).

The acceptance and adoption of technology also required a more direct approach, including the training of academic staff over the past 20 years as discussed below. According to Toyama (2011), technology does 'not cure unhealthy educational systems; at best, it only augments healthy ones.' Hence, merely focusing on technology is not adequate unless there is a change in mindset and adequate training in pedagogy to tap the potential of online learning.

Training of Staff

As far back as the early 1990s, there was a realisation that the academic community, apart from its training in its respective disciplines, also needed training in the field of teaching and learning and quality assurance. Therefore, the UoM started investing seriously in the training of its academic community. There were schemes to encourage them to pursue higher degrees (Masters and PhD) and in addition, a number of workshops and training sessions were organised on quality assurance (QA), distance and online learning, designing effective modes of assessment, and the integration of technology in teaching and learning. The training involved short-term, non-award courses as well as award-/credit-bearing modules and full-fledged programmes. Partnerships with both English- and French-speaking organisations have been instrumental in the capacity building for distance/online learning at the UoM.

In the 1990s, through funding from the Canadian Government, a number of training programmes were specifically geared to train staff in distance and online learning:

- The Canadian International Development Agency funded a project that led to the creation of CEMS, where key personnel were trained on DE administration and instructional design (UoM 1998:62).
- PRIMTAFF 1996-1997 (Programme de Renforcement Interinstitutionnel en Matière Technologique en Afrique Francophone) was a project where academic staff from different faculties were trained on how to develop learning material where they had to actually develop modules that would be used in existing UoM programmes (UoM 1997:53).
- A project of the Agence Canadienne pour le Développement International, called CAERENAD (Centre d'Apprentissage et d'Etude et de Ressources en Formation à Distance) was launched, where more academic staff were trained and, with key personnel from CILL, received their more formal training on distance and online learning. With this project, more emphasis was laid on the integration of technology (UoM 1998:63).

These training programmes and exposure to international projects have contributed to bring about a new teaching and learning culture among the academic community. The solid pedagogical grounding and maturity, hence achieved, ensured that during the COVID-19 confinement, academic staff members were able to tap from their own repertoire of knowledge, skills, and experience, and experiment with different pedagogical and technological models that would work for their students and their disciplines.

One ongoing initiative in the field of teaching and learning that was launched in 2002 (UoM 2003:73-74) is the Postgraduate Certificate/Diploma/MSc in Teaching and Learning in Education. Since its launch, this programme has involved academic staff from all the faculties. The first module of the programme, 'Academic Induction' is still a compulsory module for all new academic recruits who are only confirmed on the establishment of the UoM after they have successfully completed this module. Although this training is about teaching and learning theories in general, it provides academics with a solid foundation in pedagogy (e.g., writing learning outcomes, constructive alignment, designing assessment, and rubrics) that would facilitate the transition to online/blended learning and also provide them with the pedagogical agility to adapt to unplanned disruptions such as the COVID-19 lockdown.

Infrastructure Development

To facilitate the evolvement towards digital transformation, UoM developed the infrastructure discussed below.

Modernising the UoM Library

Over the past 30 years, the UoM library has modernised its services to provide better services to the academic and student communities on campus as well as to serve other researchers/members of the public. The computerisation of the UoM library started in 1995 and since 2007, the UoM library switched journal subscriptions from printed to electronic journals to reduce the cost of subscriptions, while providing access to a wider range of e-journals (UoM 2007:79; 2008:71). With this move, students and academic staff could access research materials anytime and anywhere.

In 2018, the UoM launched its e-library (UoM 2018a; 2019) in order to improve the delivery of adequate library services to the increasing number of registered users of the library as well as to satisfy the multiple requests received from individuals who are not registered members of the university, but still wish to have access to its valuable and often unique library resources. The e-library aims to transform the UoM library into an institutional repository of the institution's books, papers, dissertations/theses, and other works which can be digitised, or which were 'born digital.' The setting up of the e-library was immediately followed by the opening of access to its electronic resources that do not fall under the Digital Rights Management restrictions to members of the general public against payment and under certain specific terms and conditions. In 2019/2020, the e-collection was open to all public ethical institutes and the public (UoM 2020a:262).

On 31 July 2020, the UoM e-library collection consisted of around 100,000 e-books, 14,200 dissertations/theses, 25,000 journals, 3,600 lectures, seminar style talks and case studies, and 700,000 law cases, as well as a wide range of legislation, legal commentaries, and handbooks, journals, and bulletins. Additionally, the UoM e-library was further developed and consolidated with the contents of EbscoHost, Emerald Insight, ScienceDirect, Henry Stewart Talks, and also the LexisNexis and Dalloz law databases, as well as the UpToDate collection of medical journals and the Datastream collection of Financial and Economic Research Data. Free access was also available to the electronic journals in JSTOR (Scholarly Journal Archive) and the Directory of Open Access Journals. UoM dissertations/theses that were 'born digital' are already being stored in their origin format on the library server and they can be accessed via the UoM intranet. Other parts of the library print collection are being digitised within the parameters and without any infringement of the existing copyright legislation (UoM 2019:294-295).

The introduction of the e-library has led to a more optimal use of resources in terms of costs, physical space, and time. More library open floor space is now available as study area for students, thus alleviating the pressure by students on its print collection. At the same time, the UoM library has

become accessible to a greater number of users who may not be traditional patrons of a library, and to the general public for a wider and more optimal use of the resources and services. In addition, the time between the ordering of e-material and their availability in the collection has drastically been reduced. The e-library has also contributed towards the preservation of print material by providing access to copies of documents that otherwise fall to degradation from repeated use. Digitisation definitely enhances legibility and removes visible flaws such as stains and discoloration. Additionally, the pressure on limited space in the library building has been relieved as users can now access this material online on a 24/7 basis. Information retrieval has been enhanced through the adoption of innovations in technology to provide users with online access to the library catalogue as well as multiple search terms (author, title, subject, keywords, and phrases) to the entire electronic collection.

Noteworthy is that apart from the UoM library, library patrons also have a parallel system of accessing databases and the internet. As far back as 1993, SYFED (System Francophone d'Edition et de Diffusion) was set up to provide resources to researchers through an online database and CDROM. The AUPELF/UREF project eventually equipped the SYFED with REFER (Reseau Electronique Francophone pour l'Education et la Recherche – which was basically the Francophone internet) (UoM 1996:4). These facilities allowed researchers to access numerous international journals, especially francophone material. Now known as the AUF (Agence Universitaire Francophone), it has a unit, CAI (Centre d'Accès à l'Information, renamed to Campus Numerique Francophone in 2006) that continues to offer access to a vast collection of resources. The setting-up of the e-library at the UoM has been instrumental in supporting the learner-centred credit system and online delivery at the university, hence contributing to its digital transformation. The ease of access to e-resources – electronic books and scholarly journals, web-based catalogues, as well as bibliographic and full-text databases – was particularly beneficial to academics and students during the confinement period. In addition, free access to the library's e-resources was made available to the public as a means to support knowledge building and innovation.

The Setting-up of the Centre for Information Technology and Systems (CITS)

CITS was set up in 1998, after a restructuring of the former computer centre of the faculty of Engineering (UoM 1998:65). The core contribution of CITS over the following years would be to develop the student information systems, the management information systems, and other services that would help to modernise the university. CITS represents the IT backbone of the UoM around which all the activities of the UoM transit through.

Since 2004/2005, all the UoM services are online, from application to graduation: Students apply online, while they have access to a toolkit, launched

in 2008 (UoM 2008) that facilitates the choice/selection of programmes based on results and combinations of subjects. Students are notified via e-mail about the outcome of their application and until they graduate, results, transcripts, and all UoM correspondence are done via e-mail. Therefore, during lockdown, students had a line of communication with the UoM. Hence, despite the fact that the national lockdown coincided with the peak application period for fresh university students, the Admissions and Student Records office was able to function fully and process fresh applications for the new academic year.

In 2012, the UoM was equipped with free Wi-Fi and was considered as having 'one of the largest Wi-Fi networks in the island and that there are currently about 12,000 users subscribed on the UoM Wi-Fi Network' (UoM 2013:135). This facilitated access to the valuable resources and services to enhance online learning.

As from 2014, the UoM has been implementing its University Integrated Information System with modules like Oracle Financials, Payroll, iProcurement, Core HR, Employee self-service, and procurement contracts (UoM 2014:200). Hence, during national lockdown, management, as well as administrative and technical staff were able to work from home in a seamless manner.

Apart from providing the IT infrastructure for the administration and management of UoM, CITS has also been contributing to enhance the teaching and learning experiences of the academic and student community (UoM 2020a:285-290; UoM 2020b). Academics at the UoM are encouraged to embrace ICTs to support their teaching and student learning through the blended learning concept.

The two LMSs that are currently used by the UoM community are Moodle and Google Classroom. The university also uses the Canvas platform to deliver an MBA degree in collaboration with DUCERE Global Business School. While fully online programmes are delivered via Moodle, Google Classroom is primarily utilised for blended learning for individual modules where lecture material, assignments, as well as quiz and discussion forums are structured on the platform for asynchronous access by the students (based on the flipped classroom model). The synchronous online virtual lectures and discussions are conducted using Google Meet or Zoom.

The university has implemented the Moodle platform on premise and is contemplating the implementation of Moodle on the cloud to improve the accessibility and feature availability.

Prior to the lockdown period, CITS had been testing a number of tools and developing guidelines that would be deployed once the lockdown was imposed: These guidelines/quick reference guides were helpful to ensure that lecturers could mount their own courses on Google Classroom and tap other tools from the G-Suite such as Google Meet (UoM 2020b). These apps can

be easily downloaded on end user devices for anytime/anywhere access. The lecturers and students have a single platform with a similar interface which they utilise for communication, real-time collaboration and online teaching and learning. Zoom has also been adopted by the UoM community as a whole – the academic and administrative staff and students. Recently, the university has launched iLearn, an online platform to promote continuous professional development in different areas. The platform promotes the concept of MOOCs and microcredentials.

Given the dynamic nature of the services offered by CITS to UoM users, be it students or staff (academic, technical, and administrative), training is ongoing to ensure that they are well conversant with the upgrades and changes. CITS provided training to academics on the use of Google Classroom and Google Meet in 2019 and 2020. After the national lockdown and confinement from March to May 2020, additional training was provided to consolidate the skills of the academics and administrative staff to enhance their levels of preparedness (UoM 2020b).

Since the beginning of the academic year 2020/2021, 353 online classes have been created on Google Classroom. It can be said that though the transformation of the UoM with regards the adoption of ICT started 20 years ago, the lockdown acted as a catalyst to accelerate the acceptance of technology in the 'classroom' and hence to contribute to the digital transformation of the university.

Quality Assurance Mechanisms

A milestone for the establishment of QA mechanisms in order to transform UoM into a modern university was the creation of the office of distance education and curriculum development in 1993. The main contribution of this office was:

- Modularisation of courses.
- Semesterisation.
- Credit system.

In 1999, the university established a QA team. According to the UoM Annual Report of 1999/2000, that was the year when QA became a 'guiding principle' (UoM 2000:11). A series of workshops were organised and student feedback questionnaires as well as module information sheets were introduced. These invitations acted as a 'paradigm shift' at the time because it brought about accountability and transparency in the way teaching was being carried out. Teaching and learning would henceforth no longer be happening behind closed doors but would be open for public scrutiny and hence for rigorous quality control. Moreover, rules and regulations that were *ad hoc* and not available

in a consolidated manner would henceforth be available online by means of a compendium.

By 2005, the university was the first public tertiary educational institution to go through an independent QA audit with two more audits being carried out in 2012 and 2018, conducted by the former Tertiary Education Commission, now Higher Education Commission (Mauritius).

In 2018, the Learner-Centred Credit System (LCCS), in the same vein as the European Credit Transfer System was introduced. While the initial credit system, introduced in the early 1990s aimed to rationalise the content of the modules, the LCCS had a more pedagogical concern in line with emerging trends in the field of education and also the landscape of learning, largely dominated by the extensive use of the internet and prevalence of technologically induced teaching methods. The previous system was only computing the number of hours of lectures and practical sessions. The LCCS is based on the workload prescribed for students in order to achieve expected learning outcomes, i.e., the time typically needed to complete all learning activities such as lectures, seminars, projects, practical work, self-study, and examinations.

Table 1 below summarises the main characteristics of the previous and current credit systems of the UoM. In addition to its outcome-based focus, the LCCS lays emphasis on the enhanced use of technology in teaching.

Table 1: Previous and Current Credit System of the UoM

UoM Previous Credit System	UoM Current LCCS
Teacher-centred approach (1.0 CR).	Student-centred learning rather than the conventional one.
Limited time to develop critical/ analytical skills.	Active rather than passive learning.
Limited time for independent study/ learning.	Focuses on learning outcomes and the enhanced use of technology in teaching.
Over-reliance on lecture notes.	Helps to develop critical and analytical skills and assists students to strengthen their competence in their field of study.
Leads to cramming.	
Overloaded modules and terminal degree syndrome.	Promotes independent learning and self-study.
Difficulty in appreciating the material delivered for a module.	Enhances search and research skills.
Does not encourage innovative learning.	Focuses on reflective and interactive approaches.
Learning hours get out of control.	
No proviso or guidance regarding self-learning by students.	

Source: UoM 2018b.

By converting its modules to LCCS, modules are delivered through the blended learning mode, while technology is mainstreamed in the delivery of programmes.

Status of Online Learning Post COVID-19

Though the mode of teaching is primarily face-to-face, the university has increasingly been moving towards a blended learning approach for its programmes, with some modules already completely online and with innovative modes of assessment such as project-based assessment and portfolios.

The complete lockdown of the country during the period March to June 2020, almost on the eve of the wrapping up of the academic year, with final exams initially scheduled in May 2020, was a challenge to the UoM management, the lecturers, and the students. At primary and secondary school levels, the government of Mauritius had put in place some form of remote teaching through the national television and online teaching. At the UoM, the challenge was to use the university's own resources to find alternatives. The management of the university had to reschedule all its activities and set the machine rolling to cope with the disruption that was sudden and unplanned.

With hindsight, it can be argued that the UoM successfully transitioned into the 'new normal.' As the academic calendar was expanded by two months, the university was able to reinvent itself within a short time span and explore alternative ways of teaching, learning, and doing other business. Unlike the primary and secondary school levels where government intervention was warranted at the national level, the university pooled its resources to mitigate the impact of the lockdown on the students, the academic community, and administration in general. With several robust pillars and mechanisms already in place, the level of preparedness of the university was high. These pillars and mechanisms, mentioned earlier, which represent the foundation of the UoM, were not set up overnight. They have been introduced and tested, and are now part and parcel of the DNA of the institution.

Digital Transformation

There is now ample evidence of the considerable progress made by online learning since the early 1990s through the development of new technological devices, tools, and the internet (Tallent-Runnels *et al.* 2006:93-94). The time has now come for higher education institutions to probably move a step further and embrace the digital transformation which some argue is not a novel phenomenon or a paradigm shift, as it has accompanied higher education institutions for some years now (Kopp, Gröblinger, & Adams 2019:1448; Leszczyński, Charuta, Łaziuk, Gałązkowski, Wejnarski, Roszak,

& Kołodziejczak 2018:151-152). Digital transformation is 'a series of deep and coordinated culture, workforce, and technology shifts that enable new educational and operating models and transform an institution's operations, strategic directions, and value proposition' (Brooks & McCormack 2020). This definition goes far beyond digitisation (of analogue information) and digitalisation (of processes) (Brooks & McCormack 2020).

Digital transformation transcends the mere use of technology, in encompassing how it transforms people, infrastructure, and processes. Similarly, in the higher education sector it permeates teaching, infrastructure, curriculum, administration, research, business process, human resource, extension, digital transformation governance, information, and marketing (Castro Benavides, Tamayo Arias, Arango Serna, Branch Bedoya, & Burgos 2020). The experience gained from online delivery and the development of educational tools should enable universities to fully embrace digital transformation.

The latter is thus not only the adoption of new digital teaching methods and tools, but encompasses new digital processes, helping students in achieving the skills and competencies needed to act in digitalised societies and economies (OECD & EU 2019; Bond, Marín, Dolch, Bendenlier, & Zawacki-Richter 2018:49-50; Sandkuhl & Lehmann 2017:53). Higher education institutions can thus play an important role in helping the industry in skilling/reskilling its workforce as well as adopting emerging technologies. As discussed in the previous sections, e-libraries have a prominent role to play in this transformation, which is key to supporting innovation in universities, enabling them to better impact on society.

Such a transformation is not a purely linear process, but the result of four components acting simultaneously: 1) Realigning higher education with the information age; 2) redesigning higher education to achieve this realigned vision; 3) redefining the roles and responsibilities within realigned, redesigned higher education; and 4) reengineering organisational processes to achieve dramatically higher productivity and quality (Dolence & Norris 1995).

The digital transformation process involves an adequate strategic preparation, trust establishment, thinking in processes, amalgamation and reinforcement of all parties involved, as well as separate, collaborative, and organisational knowledge (Adedoyin & Soykan 2020:2).

Conclusion

Online delivery of lectures, the development of educational technologies, and digital libraries all date back to the 1990s. However, it is a fact that universities in the less developed and developing worlds have been lagging behind, the consequences of which have been felt during the COVID-19 pandemic,

especially on the African continent. Preparedness and proactiveness are very important to face adversity. At the University of Mauritius, the shift to the learner-centred credit system in August 2019 not only aimed to develop outcome-based and independent learning, but also to encourage the use of EdTech in the delivery of lectures. The transformation of the UoM library into a digital library was completed in 2018 and all this helped us to change smoothly through the pandemic and lockdown.

To fully implement digital transformation, a cultural change is necessary to overcome the fear of uncertainty and insecurity (Singapore Management University 2018). This cultural change is necessary as the workforce of the future will have to be fully equipped with critical digital skills, namely information, media, and technology skills; learning and innovation skills; and life and career skills. Public policy will have a key role to play to train the next generation workforce. Universities have to set priorities and overcome a cultural shift resistance; governments have to support and mobilise resources; regional and international institutions should lend their financial support and review their priorities; university networks and associations will have to shoulder their members through adequate training; while industry will have to join hands in the development of a concerted strategy for digital transformation, retraining, and re-skilling of employees. It is a matter of collective effort and partnership as clearly stipulated by Sustainable Development Goal 17 of the UN (UN 2015; Stibbe & Prescott 2020).

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The Shifting and Changing Research Landscape and the Academic Librarian's Response

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Abstract

Research is increasingly changing due to among other reasons, technological advancement, funding models or policies, the general transitions on the international scene and lately, the Coronavirus disease (COVID-19). The dawn of COVID-19 has particularly transformed the conduct of research. Apparently, both opportunities and constraints are emanating from this epoch which researchers and academic librarians have to embrace. The study was conducted as a literature review to gather data for the study on how the research landscape is shifting in order to determine ways in which academic librarians could best serve researchers. Adequate research support is key to success in academia because research institutions are also ranked on the level and quality of their research output on ranking platforms. The author argues that the changing research landscape transforms the role of the academic librarian. The study findings indicate that trajectories in research have modified the role of the academic librarian from a supporter through collections and training, to a partner in the entire research life cycle. Suffice to say, any change process bears challenges which academic librarians may encounter in their quest to promote research, and these were determined in this chapter. The chapter ends with some insights about new and innovative ideas for the further promotion of research. The study adds value in understanding the trajectories in conducting research, and what academic librarians need to do in light of the changes, for the benefit of research.

Keywords: Research landscape; academic libraries; COVID-19; Fourth Industrial Revolution (4IR); South Africa

Introduction

The quest to find solutions to ever-growing societal challenges has resulted in the exponential increase in global research. Such challenges include, but are not limited to poverty, unemployment, diseases, underdevelopment, and inequality. Coupled with increased research is the issue of competition to find

solutions by countries and institutions. South Africa alone contributes about one percent of the world's research output, and this constitutes 10 percent in terms of the world citation impact (Bawa 2020). Not only is research linked to solving challenges, but also contributing to innovation. In this regard, research efforts have yielded positive results which have resulted in the development of organisations and countries. In the past, most research efforts were characterised by lengthy timeframes before meaningful results could be realised. The way in which knowledge is generated, has shifted much and changed with time. For instance, research turnaround times have shifted largely due to advances in technology, collaboration, and improved communication means (Porter & Hook 2020).

As way back as 2003, a Canadian research report indicated the need to collaborate in research in order to prevent what the report referred to as knowledge apartheid (AUCC 2003). In light of this statement, many authors can successfully collaborate on a single document. Related to this point is the issue of multidisciplinary and interdisciplinary research which has also witnessed a significant growth as research collaboration increases (Porter & Hook 2020:2). Already in the middle of 2020, Porter and Hook (2020:2) observe that there has been an immediate research response to COVID-19, which has resulted in 42,703 articles being published, 3,105 clinical trials, 422 datasets, 272 patents, 757 policy documents, and 156 grants at a global level. This enhances opportunities of finding solutions to challenges by using knowledge from a diverse perspective. The recent emergence of the Coronavirus scourge has further accelerated the need for more collaboration in research, as researchers from across the globe are battling to find a solution to this pandemic. Not only do researchers work on finding a cure or vaccine for COVID-19, but a lot of work has gone into developing lifesaving equipment such as ventilators, personal protective equipment, and screening tools and apps, among other initiatives.

These developments in research have resulted in a widening scope of the role of the academic librarian. New services and infrastructure such as Research Data Management (RDM) and Research Commons, have emerged in an effort by academic librarians to support research in line with the changing research landscape (Chiware & Becker 2018; Chiware 2020).

The main aim of this chapter is to determine shifts and changes in the research landscape and the academic librarian's response to the changes. The following questions were raised in order to help answer the main aim of the chapter:

- What are the trends in the research landscape?
- How has the academic librarian responded to the changes?
- Which challenges and opportunities are created by the shifting and changing research landscape for the academic librarian?

Methodology

Data for this study was gathered through a critical literature review of relevant previous studies based on the research questions of the study. The review focused on literature about changes in research, how the librarians have responded to the changes, challenges which were encountered, and opportunities presented by the shifts and changes in the research landscape. Suitable articles which were searched, using keywords such as 'research landscape,' 'academic librarians,' 'COVID-19,' and 'Fourth Industrial Revolution,' were downloaded from the researcher's university library databases. Searches were performed on the library's integrated platform, EBSCO Discovery Service (EDS), which links to all collections in the library. An effort was made to restrict the articles to those which were published during the past five years in order to ensure currency and relevance to the modern research environment. The search on EDS yielded 20 articles which were relevant and were used in the study, in addition to searches performed on professional organisation sites such as IATUL, USAf, and IFLA (International Federation of Library Associations and Institutions). However, three of the used sources fell outside the five years restriction, largely due to their relevance for the current study. In addition, discussions with librarians and researchers at the researcher's place of work, particularly during the 2020 open access week which ran from 19-25 October 2020, further enriched the knowledge of the researcher on the topic of the study.

Literature Review

In this section, a review of related literature, focusing on the topic and the study objectives was conducted. The review began with a focus on the South African research environment as a way to put the study into a proper context. The review ended with a focus on the shifts and changes in research librarianship.

The South African Academic Research Environment

The South African government places a strong emphasis on research and this is demonstrated by the amount of financial support which is channelled to universities and other research institutions (Onyancha 2018). A recent testimony of the South African government's respect for research is the appointment of a ministerial advisory committee on COVID-19. Porter and Hook (2020) describe this move as a return to reason, bringing most people's and government's trust of science, scientists, and experts back into the limelight. The South African COVID-19 committee had the task of advising the Minister of Health on research-based evidence about strategies to combat the Coronavirus pandemic. Furthermore, the government of South Africa recognises and funds research output through the Department of Higher

Education and Training, Science and Technology, and the National Research Foundation (NRF), among other key state funders. Universities on their part should also be commended for forming Universities South Africa (USAf), formerly Higher Education South Africa, which is a membership organisation. USAf speaks on behalf of member institutions about matters pertaining to research, teaching and learning, as well as community engagement (USAf 2019). In response to this noble cause of speaking with one voice on matters of mutual interest, the academic (university) library sector in South Africa formed, among other groupings, the Committee of Higher Education Libraries of South Africa (CHELSA) which enjoys a good working relationship with USAf. Among the legal and policy imperatives on research, the South African constitution recognises the rights of people to freedom of scientific research, as well as access to information (South African Government 1996).

A white paper on Science, Technology, and Innovation was developed to pave the way for greater efforts in research (Bawa 2020). This followed a national framework which was developed jointly by South Africa and the European Union (SA-EU 2018). One of the main principles of open science is that research results should be easy to find, accessible, interoperable, and reusable. Public universities in South Africa are established through statutes which give effect to the Higher Education Act of 1997. Universities further have research policies and strategies with which they conduct their research. As already pointed out in the introduction, South African universities compete favourably well with other big African economies such as Nigeria and Ethiopia and contribute 1 percent to the world's research output (Bawa 2020). In addition, South Africa has some of the most reputable universities in Africa, which are ranked highly on most ranking platforms. The academic libraries contribute in a great measure to the high profile ranking through their open access initiatives and the general promotion of research on campus.

COVID-19, the Fourth Industrial Revolution and Academic Libraries

We live in interesting times, which are also uncertain. The changes that have been taking place in scholarly communication are being accelerated in areas around COVID-19 research. Open Access models, rapid peer reviews, preprints, and next generation search technologies are all playing a role in accentuated ways as a part of this extreme situation (Porter & Hook 2020:20). According to Ocholla and Ocholla (2020), the Fourth Industrial Revolution (4IR) affects everything including research and libraries. The 4IR is a terrain which is characterised by a high adoption and use of technologies.

Whilst academic libraries in South Africa and globally began to pay attention to the demands of the 4IR as evidenced in the study findings of Ocholla and Ocholla (2020), a new terrain, a devastating flu-like virus known

as the Coronavirus emerged allegedly in China towards the end of 2019 (Porter & Hook 2020). Due to global movements of people for business and leisure, the pandemic was spreading like wildfire. As is now common knowledge, the virus has affected more than 200 countries, including South Africa (South African Government 2020a). According to Porter and Hook (2020), the virus moved from China to the West and has left a trail of destruction which will be felt for at least a generation. In order to put countries on high alert, the World Health Organisation declared COVID-19 a world pandemic (Chisita 2020). The South African government responded and invoked the Disaster Management Act of 2002 and declared a national state of disaster, published in Government Gazette No. 43096 on 15 March 2020 (South African Government 2020a). This paved the way for a national lockdown, announced by President Cyril Ramaphosa on 15 March 2020, which came into effect on 26 March 2020.

Academic libraries, among other institutions and organisations, closed their physical buildings. Fortunately, academic libraries had long established two sets of libraries – the physical library and the virtual library. In order to continue with business as demanded by their parent institutions, full attention shifted to the virtual libraries which comprise eBooks and eJournals. In sympathy with the sudden changes, South African publishers made available for free some of their online resources, in addition to online news and training support for librarians and users. In a survey of academic library services during the COVID-19 pandemic period, CHELSA (2020) notes a wide range of online user services which were available in support of the institutions' core business in teaching and learning, as well as research and community engagement. The survey's focus was on four areas, namely:

- business continuity plan;
- services;
- staff; and
- moving to post-lockdown (CHELSA 2020).

The survey results indicate a growth in Libchat services and other social media platforms, in line with the tenets of the 4IR. The results further reveal similar trends which were noted elsewhere in the world as recorded by IFLA (2020), Greenhall (2020), and others. There was also a notable shift from the traditional library services of collection development of mostly print resources (Raju & Schoombee 2014), to the acquisition of eBooks and related online materials. Prior to COVID-19, great efforts were underway to embrace the 4IR, as already alluded to. The government of South Africa, for example, formed a presidential commission on the 4IR. The commission identified six strategic areas: Investment in human capital; artificial intelligence; advanced manufacturing and new materials; the provision of data to enable innovation; future industries; and 4IR infrastructure (South African Government 2020b).

Of interest to these strategic areas is the provision of data to enable innovation. Librarians play a critical role in proper data management practices as this chapter will reveal further. In addition, the University of Pretoria acquired a robot known as Libby in 2019, which helps to answer library user inquiries (Thekiso 2019; Ocholla & Ocholla 2020). Other initiatives by academic librarians include the establishment of ChatBots and LibAnswers in order to help respond to growing and frequently asked questions (Fichter & Wisniewski 2017; Nawaz & Saldeen 2020).

The Growing Role of the Librarian in the Research Life Cycle Framework

In order to understand the shifts and changes in the research landscape in general, and in particular the role of the librarian, this chapter is informed by the research life cycle framework. This framework has been successfully applied in part or in full by researchers focussing on new roles of librarians in research such as Chiware (2020), Onyancha (2018), and Chung, Kwon, and Lee (2016). Although the research life cycle may slightly differ from one discipline to the other, there is a general consensus on key principle stages, namely idea generation or discovery, research proposal, conduct research, publish research, or results dissemination. At each stage of this research life cycle, a librarian is involved, starting with the identification of suitable sources of data to reuse, followed by an advisory on ethical issues and the development of a data management plan, after which the librarian then advises on data curation, metadata, visualisation, intellectual property, and finally, advice on open access, the assigning of persistent identifiers, and storage support matters (Chiware 2020; Chung, Kwon, & Lee 2016).

Based on this framework, other librarian roles emerged, such as the advisory and measurement of the research output, in order to determine its impact. In this regard, the International Association of University Libraries (IATUL) released a model in 2020 on how to train research support librarians in research impact matters. The model covers 11 areas, starting with that of bibliometrics, identifiers such as ORCID, traditional, and emerging metrics, the responsible use of metrics, publishing strategies, open research, benchmarking, rankings, equity, diversity, inclusion, and societal impact (IATUL 2020). This model provides an elaborated librarian's growing functional work area in research support.

Review of Shifts and Changes in Research Librarianship

Studies focusing on shifts and changes in the research landscape in general and in research librarianship in particular, have been conducted at varying degrees. Some studies have traced changes in specific research support and partnership matters such as research data management (Chiware 2020), bibliometrics

(Onyancha 2018), data sharing (Bangani & Moyo 2019), as well as new skills and positions (Ochola & Ocholla 2020). However, more comprehensive studies tracing changes in scholarly communication and research support have been conducted by scholars such as Pasipamire and Hoskins (2019), Ketchum (2017), Keller (2015), and Raju and Schoombee (2014). One of the major talking points in research is open science. Bawa (2020) defines open science by its characteristics, as an approach to research based on greater access to public research data which are enabled by information and communication tools and platforms, broader collaboration in science, including the participation of non-scientists, and the use of alternative copyright tools for diffusing research results. Key attributes of this definition are greater access, research data, information technology, broader collaboration, and the inclusion of non-scientists in the process which suggests equity and transparency in research.

In a study on data librarianship in South Africa, Chiware (2020) notes that developments in open science have imposed new skills demands on librarians. Chiware further posits that librarians need to have a good understanding of open science in order to be able to provide meaningful and relevant services. In this regard, Keller (2015) suggests that librarians should in fact see themselves as partners in research who provide services in the following five key areas:

- institutional repositories;
- open access;
- bibliometrics and the enhancement of research impact;
- support for research students; and
- research data management.

These are areas which are driven by open science, and they constitute shifts in research in general, and in research librarianship in particular. Raju and Schoombee (2014) argue that the changing higher education pedagogy, digitisation of scholarly content, and the increasing relevant technologies had a significant impact on the transformation of academic library services. Traditionally, academic libraries were known for offering services such as collection development, user training, reference services, and the dissemination of information (Nitecki & Davis 2019; Pasipamire & Hoskins 2019; Raju & Schoombee 2014), but due to shifts and changes in the research landscape, the support terrain has shifted significantly. Shifts in research support were marked by the introduction of research infrastructure through Research Commons and the institutional repositories (digital and open scholarship) to archive and disseminate research output (Ocholla & Ocholla 2020; Raju & Schoombee 2014). In the evolution of the scholarly communication, Ketchum (2017) traces eight topics of focus for librarian support in the shifting research landscape. The areas of focus are mapped around the research life

cycle and consist of funding, literature search, open access publishing, data management, copyright, documentation, dissemination, and metrics impact.

Although Onyancha (2018), in a study on 21st-century librarianship, focuses on bibliometrics and metrics, he concurs with Ketchum (above), on areas such as data management and the general support for researchers. Onyancha further marks the emergence of new librarian titles, arising as a result of the shift in research support. Such titles include 'Data services librarian,' 'Librarian: Research impact and Research Commons,' and 'Bibliometrics and research impact librarian.' Chiware (2020) also reveals new roles for librarians, like research data curator, data curation officer, and research and scholarly communication librarian. Furthermore, Chiware (2020) implores the library and information science schools to adjust their curriculums in order to educate and produce graduates who respond positively to the shifting and changing research landscape. Chiware advocates for mergers in courses with computer science and related courses so as to produce ready data professionals. His study reveals a lack of readiness and preparedness by librarians to embrace new roles.

Despite the exciting opportunities presented to librarians by the changing research landscape, there is a myriad of challenges to offer new services which are in demand. Keller (2015) posits that although there are generous kick-off schemes, it is usually time limited, even if the services are required on an ongoing basis. This results in the library management having to drop certain services in order to accommodate new and affordable ones. Yet another challenge is the lack of and therefore the need for relevant skills (Chiware 2020; Onyancha 2018) and the ability to adapt to change. Other challenges include limited personnel assigned to new roles, a lack of policy, a lack of commitment from researchers, and budgetary constraints (cf. Chiware 2020; Onyancha 2018; Pasipamire & Hoskins 2019; Keller 2015).

In some cases, librarians are generally invisible in the research life cycle (Pasipamire & Hoskins 2019). Raimondo, Harris, Nance, and Brown (2014) argue that providing research related services has challenges for librarians, some of which include time constraints and the interpretation of the scientific and legal language being used in some research disciplines. Pasipamire and Hoskins (2019) as well as Keller (2015) further bemoan the lack of partnership and collaboration among librarians and the faculty which in turn affect the quality of research support efforts. Some challenges are also related to a lack of proper infrastructure to support research and the general lack of institutional management support. Moyo and Mavodza (2016) cite image challenges relating to the faculty standings of librarians, which are usually coupled with inferiority complex issues.

With these challenges in mind, it is also important to look at the bright side and explore the opportunities which are presented to the librarian by the shifting and changing research landscape. Available literature indicates that new librarian positions and responsibilities have been created (Chiware 2020; Onyancha 2018; Robertson 2018; Ketchum 2017; Keller 2015; Raimondo *et al.* 2014). Mackenzie (2020) asserts that the COVID-19 pandemic was both highlighting and hastening the changing role of libraries, adding that librarians are innovative and creative in their responses. One other opportunity for librarians is the improvement of their qualifications, whether through formal studies or short learning programmes on new work trends such RDM, bibliometrics, and altmetrics (Chiware 2020; Onyancha 2018).

According to Onyancha (2018), university authorities are increasingly turning to librarians for information to address their research related needs, and this provides information professionals with an opportunity to re-position themselves as mission critical to their organisations. The shifts and changes in the research landscape have provided librarians with clear opportunities to add to the existing catalogue of services, new and innovative functions which respond positively to the new needs in an open science environment (Pasipamire & Hoskins 2019; Onyancha 2018). Keller (2015) advocates for the dropping off of some 'redundant' roles in order to accommodate new roles. There is also an opportunity to strengthen relationships with researchers, research administrators, and IT staff in order to strengthen research services. In the end of the collaboration, all stakeholders will be winners, including the broader society which stands to benefit from the knowledge that is created.

Findings and Discussions

Research has gone through major changes over the years and in order for research service supporters to be able to provide better support, it is critical to carry out regular formal reviews of the changing environment. This study explored shifts and changes in the research landscape and how academic librarians have responded to an avalanche of changes in the research culture. In particular, the study sought to answer the following key questions:

- What where the shifts in the research landscape?
- How did the academic librarian respond to the shifts and changes?
- What were the challenges encountered as well as opportunities presented to academic librarians by these shifts and changes?

In order to provide answers to these questions, a literature review of related works focusing on South Africa and other parts of the world was conducted. It is important to point out that, whilst the review did not aim to be comparative in terms of academic libraries in South Africa and elsewhere, there was a

similarity in most study findings (Chiware 2020; Bangani & Moyo 2019; Chiware & Becker 2018; Onyancha 2018). The findings of this study are presented and discussed below according to themes which emanated from the research questions.

Shifts and Changes in the Research Landscape

One of the major triggers of shifts and changes in research is arguably open science. According to Bawa (2020), open science is underpinned by the values of inclusiveness, mutuality and fairness, collaboration, transparency, and sharing. Governments and other research funders have introduced policies which require researchers to openly share research data as well as their final outputs (Chiware 2020; Bangani & Moyo 2019). Open science has provided librarians with clear opportunities to be actively involved in the research life cycle. Bawa (2020) shares seven areas of implementation of open science, namely open notebooks, data sharing, transparency in methodology, open access to publications, research evaluation systems, open-source codes, and open infrastructure. The curation of research data through repositories of data and completed research output such as theses and dissertations, journal articles, conference proceeding, and others, is one of the areas underlying the research landscape changes. Curation of data is part of the broader research data management services which are offered by academic librarians in South Africa and beyond, and are featuring prominently due to developments in open science (Chiware 2020:401). Yet another finding of the major trends in research is collaboration of researchers within and across disciplines, across institutions, and across countries (Bawa 2020; Porter & Hook 2020; Chiware & Becker 2018). Librarians play a critical advisory role in research collaboration in terms of where to publish, who to collaborate with, and the tracking of impact, using bibliometrics and altmetrics (Onyancha 2018). Other areas which top the list of changes in the research landscape include the emergence and growth in multidisciplinary and interdisciplinary research, funding, and policy (Bawa 2020; Bangani & Moyo 2019). Master's and Doctoral research outputs were characterised by an unprecedented volume (Onyancha 2018). In addition, ethical requirements in research outside the sciences was also growing in other fields of studies as librarians were assisting researchers with such compliance matters (Knight 2019).

The Librarian's Response to the Shifting and Changing Research Environment

Librarians are always in the forefront of innovation (Mackienzie 2020; Raju & Schoombee 2014). Their long history in working closely with faculty and researchers gives them an advantage to be able to embrace new services and roll them out to faculties, using already well-established lines of communication.

The study shows that the academic librarian in South Africa and beyond has positively responded to changes in the research environment. To begin with, librarians were learning new skills, either on the job or through formal studies (Chiware 2020; Chiware & Becker 2018; Onyancha 2018; Keller 2015). With the newly acquired skills, librarians rolled out services such as the development of institutional repositories of both data and other research outputs including journal articles, theses and dissertations, and conference proceedings, in order to enhance their discoverability and reuse. Librarians further assisted researchers with bibliometrics and metrics information requirements, including where to publish and who to collaborate with (Onyancha 2018; Keller 2015). Onyancha (2018) further argues that librarians help researchers with ranking information, registration, and the integration of researcher ORCIDs, registration on ResearchGate, and the creation of accounts on Facebook, and LinkedIn, among others. On campus, librarians are champions of open access celebratory events, as they bring together researchers, IT personnel, and research administrators to mark and celebrate their achievements in open science. This collaboration further helps to create an awareness about the importance of open scholarship.

Librarians further develop and host workshops for researchers and research students on topics which advance research. Regarding innovation, academic libraries in South Africa and globally are acquiring robots (cf. the University of Pretoria) and are championing 4IR initiatives on campus (Ocholla & Ocholla 2020). Librarians are also involved with policy development on areas such as open access, data policies, and related guidelines, in order to enhance compliance with funder mandates (Bangani & Moyo 2019) and the smooth running of research initiatives. Through the establishment of research infrastructure such as Research Commons, digital scholarship centres, open journal systems, and innovation hubs, libraries have become indispensable and integral to research. Graduate students and other researchers are finding libraries to be more user friendly and useful than ever before, a point also realised by Bangani, Moyo, and Mashiyane (2018) in a study on research spaces. In order to serve researchers and to better respond to the demands of open science, academic libraries are establishing new positions such as data librarians, digital humanities librarians, scholarly communications librarians, open scholarship directors, and others.

In addition, the library and information science schools were also responding to the shifts and changes in the research landscape, albeit in different measures, through the introduction of open science related courses (Chiware 2020). These courses equip librarians in new roles and those aspiring to be librarians, with skills which are necessary to master and discharge services which are demanded by researchers. In the COVID-19 and 4IR environment, librarians, being innovators and early adopters of new technologies as they

are, have added new tools and online services in order to easily reach out to their remote researchers (CHELSA 2020). This allowed libraries to provide an unbroken research service to their users, thus enhancing the confidence in the relationship and partnership between the librarian and the researcher.

On the whole, librarians are involved in the entire research life cycle and provide support for proposal writing, data management plans, how to apply and possible avenues for research funding, information gathering, the ethical clearance process, where to publish for maximum impact, the payment of article processing charges, research curation, and dissemination. With these functions and more, the academic librarian has become a valued partner, a catalyst, enabler, and contributor to the scholarship of research. In an era that is characterised by fake news and/or infodemic, the librarian has remained steadfast and is the first choice for the provision of scholarly information.

Challenges and Opportunities

Results indicate that there are both challenges and opportunities brought about by the new way of researching and supporting. On the one hand, the library's management has to contend with shortages of skilled workers (Chiware 2020; Onyancha 2018) against a rising demand for new services. On the other hand, the constraints present librarians with an opportunity for upskilling through short as well as formal learning programmes (Ocholla & Ocholla 2020). Relevant skills will enable librarians to respond positively to the changing research landscape and earn the respect of researchers who are constantly looking up to them for support and advice. Chiware (2020), however, indicates and acknowledges that, whilst there were only a few data related courses available, some library and information science schools were already offering the relevant courses, and this is quite commendable in view of the growing demand of open science related services.

The COVID-19 and 4IR environment further presents librarians with a perfect opportunity to refine their services despite the increased challenge for the requirement of new skills. Ocholla and Ocholla (2020) opine that a focus on competence requirements for the revolution would be pertinent. In spite of this opportunity, the online environment may also further promote inequalities regarding access. However, most universities are adopting a multimodal approach to their teaching-learning and research offerings. Regardless of the demand for new skills, the changing research environment is presenting librarians with an opportunity to expand their catalogue of services in research data management services and to work closely with researchers in research nodes and centres. Other important findings on challenges include the lack of budget, policy, as well as the commitment of researchers and institutional management. Budgetary constraints are likely to be exacerbated further by the

negative impact of COVID-19. Although the CHELSA survey results confirmed no budget cuts at the time (CHELSA 2020), academic libraries in South Africa and beyond will certainly feel the impact as institutions seek to save the jobs of those who are already on their payrolls. Libraries will have to respond by further repurposing their staff and resizing their collections.

Limitations of the Study

The study could have benefited from a mixed methods approach of data gathering. However, due to time constraints, the researcher only used literature review to gather data. In any event, the lockdown conditions in respect of the COVID-19 pandemic would have made other data gathering methods such as the use of questionnaires and interviews difficult, as some librarians were working from home with limitations of bandwidth and other related disruptions, particularly during the hard lockdown period in South Africa. These challenges would have affected the return rate or availability of targeted respondents. However, a great effort was made to select very informative articles for reviewing for the study, thereby making the research worth the while.

Conclusions

This chapter explored shifts and changes in the research landscape and how academic librarians had responded to the changes. The research shows that while changes were taking place mostly due to the emergence of open science, as well as government and funder mandates, librarians were responding by adding new research services to their functional areas. Librarians were further responding by acquiring new skills and the development of infrastructure in order to serve their communities better. The results further show specific changes in the research area as collaboration, data sharing, open access to publications, funding, policy, and data management, among others. These shifts, as the results show, have led to changes in the role of the academic librarian who now provides a set of new services. Some of the services on offer are the development of research data management plans, data curation, advisory on bibliometric and altmetrics, and support in the entire research life cycle (Jetten, Simons, & Rijnders 2019; Onyancha 2018; Keller 2015).

There are challenges which were noted in this chapter, and the study results indicate these challenges as high skills demands in order to be able to support research, a lack of supportive policies and guidelines, and budgetary constraints which are likely to be made worse by the negative impact of COVID-19. This is likely to hamper progress in the library *cum* faculty research partnership efforts. Regarding opportunities, this chapter indicates that the

shifting and changing research landscape has presented librarians with a chance to once again revive their careers in the face of freely available information, which previously was a preserve for librarians. Apart from the improvement of skills and infrastructure, librarians are now partnering with researchers in the research life cycle. In so doing, librarians have to some extent risen from just being collection developers and custodians of information, to becoming research and publishing partners through open journal systems and open repositories for open educational resources. This is once again earning them trust and respect on campus. Although the study focused on South African academic libraries, results show that the changes in research are global, and similar librarian efforts to meet the changes were noted.

Recommendations and Suggestions for Further Studies

As a recommendation, librarians should engage in graduate studies, particularly at Master's degree level so that they can have a good understanding of the research process and be able to support researchers better. This will also enable librarians to use the acquired skills to write, present, and publish about their work experiences. With that, South African academic librarians will be almost assured of a further improved image, leading to their recognition and qualification for faculty status as is the common practice in countries such as Tanzania and the USA.

A follow-up study might investigate the direct impact of COVID-19 on library research support. As lockdowns were introduced to mitigate the effects of the Coronavirus pandemic, most institutions in South Africa and beyond focused their energies on saving the academic project through online teaching and learning with limited paper-based support where possible. Similarly, librarians shifted their efforts to supporting the online modality of learning and teaching.

Final Remarks

Amid changes in the research landscape, academic librarians in South Africa and beyond have risen to the occasion by responding to the growing needs of researchers. Even with limited resources and skills, the services which are provided as revealed in this study, are quite commendable. With more training, academic librarians will be more poised to play a crucial role in research support, particularly in the context of the 4IR.

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Technologies in Two Academic Libraries During the Covid-19 Pandemic

The Case of the Alma Jordan Library and the Open Campus Libraries and Information Services, The University of the West Indies

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Abstract

The global COVID-19 pandemic has ushered in a new environment described as the 'new normal,' changing the way people live, learn, work, and communicate. Academic libraries have followed the lead of other sectors – business, government, health, and education – in adopting Fourth Industrial Revolution (4IR) technologies to re-engineer operations and re-imagine services which are supportive of teaching, learning, and research. This chapter presents case studies that highlight existing and potential applications of 4IR technologies at two academic libraries in the Caribbean, the Alma Jordan Library (AJL) and Open Campus Libraries and Information Services (OCLIS) at The University of the West Indies (UWI). The chapter discusses the short-term implementation of an artificial intelligence-driven digital assistant responsive to first-line reference and research queries at the AJL and explores the future potential deployment of 4IR technologies such as augmented and virtual reality, robotics, the internet of things, and 3D printing in academic libraries to enhance experiential teaching and learning experiences. The chapter concludes by showing how academic libraries' adoption of a best practice model can enable the seamless integration of 4IR technologies into programmes, products, and services.

Keywords: Fourth Industrial Revolution; 4IR technologies; IR 4.0; virtual reality (VR); augmented reality (AR); artificial intelligence (AI); 3D printing; robotics; internet of things (IoT); the Alma Jordan Library; The University of the West Indies, St Augustine Campus; Open Campus Libraries and Information Services; The University of the West Indies Open Campus; The UWI; academic libraries (Caribbean Area)

Introduction

The COVID-19 pandemic has affected almost all countries globally, ushering in a period of disruption and unprecedented challenges within a new environment being characterised as the 'new normal,' where social distancing, mass sanitisation of facilities, frequent washing of hands, and the wearing of masks are now societal norms. All sectors have been impacted by this health crisis, and all have shown varying degrees of responsiveness. Retailers are aggressively promoting contactless e-commerce services to consumers who are keen on avoiding physical interaction; students and teachers are engaged in remote teaching and learning in virtual spaces, using information and communication tools; and workers in public and corporate offices are exploiting new opportunities for telecommuting while engaged in flexible working from home arrangements with employers.

This period of societal upheaval during a global pandemic coincides with the rise of the Fourth Industrial Revolution (referred to as 4IR and IR 4.0). Klaus Schwab, the founder and executive chairman of the World Economic Forum (WEF) describes the 4IR as a digital revolution 'which is characterised by a fusion of technologies that is the blurring of lines between the physical, digital and the biological spheres' (Schwab 2016). The 4IR builds on the foundations of the first three industrial revolutions and represents advances in technologies such as artificial intelligence (AI), augmented reality (AR), virtual reality (VR), 3D printing, robotics, and the internet of things (IoT) (McGinnis 2020). These so-called disruptive technologies are 'affecting almost every facet of our daily life, impacting how individuals relate to technology and changing how and where work is done' (Mhlanga & Moloi 2020:2 of 11 pages).

In a 4IR world, impaired on all fronts by the novel coronavirus (2019-nCoV), the adoption of disruptive technologies in a concerted response to mitigate its impact, is evidenced in all sectors as shown in the following examples:

- *Health*: AI-driven telemedicine consultation services such as the UK-based *Ask Babylon* (Babylon 2021), enable patients to interact with a chatbot or virtual doctor to diagnose their symptoms, thus reducing the need for physical crowding at hospitals and clinics.
- *Industry*: In the manufacturing sector, 3D printers are being used at scale to supplement a shortage in the supply chain for the production of personal protective equipment (PPE), N95 respirators, ventilators, and nasal swabs (Javaid, Haleem, Vaishya, Bahl, Suman, & Vaish 2020).
- *Government*: The increased demand for driverless deliveries and non-contact operations has created new opportunities for self-driving smart cars as governments worldwide reimagine creative solutions for the transportation of medical supplies and food for healthcare professionals

and the frequent sanitisation of hospitals and other public facilities to reduce the spread of the coronavirus.

- *Public*: Every day, consumers are donning wearables (activity trackers such as smartwatches), which offer predictive analytics on monitoring heart rates, blood pressure, sleeping patterns, stress management, and healthy eating habits, in their attempt to stay healthy during a raging pandemic.

The information sector has been similarly affected, proving that libraries worldwide are not immune to this cycle of disruption in the health and technological spheres. Academic librarians in particular are being called upon to step up their game and master new skills and technologies in a reimagined future.

The agility of academic librarians in navigating this unfamiliar COVID-19 landscape by developing enhanced and innovative services have been well-documented in recent library literature and ventilated as main discussion points at online conferences. This chapter seeks to highlight the pre-emptive responses of two academic libraries in the Caribbean – the Alma Jordan Library (AJL) in Trinidad and Tobago and the Open Campus Libraries and Information Services (OCLIS) at The University of the West Indies (UWI) – to the COVID-19 pandemic. These libraries, where the authors are presently employed, presented a unique opportunity to conduct research on how two libraries, enabled by different service models – re-engineering of operations and services in the case of the AJL, and enhancement of existing offerings at the OCLIS – were able to maintain mission-critical services to communities being served. The chapter documents the integration of 4IR technologies where possible and explores the potential of implementing 4IR driven services in the future – the 'next normal' – by profiling real-world examples of 4IR adoption at other libraries.

It is worth noting that these library services as highlighted at The UWI, whether newly implemented or enhanced, when rolled out, had to adapt and conform to the 'new normal' of maintaining social distancing practices; working remotely from home; facilitating online teaching and learning; and supporting the psychosocial needs of campus communities dealing with a global health crisis. The chapter draws attention to a collaborative collegial team approach and support from campus/library administrators and librarians in the design, development, delivery, and marketing of library services during the COVID-19 pandemic.

Methodology

The chapter aims to highlight existing applications of 4IR technologies in libraries and explore the potential integration and implementation of these

technologies at two academic libraries in the Caribbean. To provide a contextual framework and articulate current trends on this topic, the authors employed secondary data analysis. Johnston (2014:619) asserts the following on the use of such methodology in conducting research, '[S]econdary analysis is an empirical exercise that applies the same basic research principles as studies utilizing primary data and has steps to be followed just as any research method.' The authors consulted a wide array of secondary resources inclusive of library databases (peer-reviewed articles), authoritative websites, institutional reports, and newsletters, and incorporated these resources to support key areas under discussion. The authors were also able to incorporate practical experiences and insights which were garnered from projects undertaken at the two academic libraries being studied, where they are presently employed.

The University of the West Indies, St Augustine Campus and the Alma Jordan Library COVID-19 Response

The University of the West Indies, St Augustine Campus COVID-19 Response

The UWI, established in 1948, comprises five physical campuses located in St Augustine in Trinidad and Tobago, Mona in Jamaica, Cave Hill in Barbados, Five Islands in Antigua, and The UWI Open Campus which offers multi-mode teaching and learning services through virtual and physical site locations across the Caribbean region. Although The UWI campuses are separated by the Caribbean Sea, they continue to strive to operate as one unified institution, *One UWI* promoting a cohesive single UWI brand consciousness (UWI 2017:8). Collectively, the university serves approximately 50,000 students and offers over 800 certificate, diploma, undergraduate, and postgraduate degree options in Culture, Creative and Performing Arts, Food and Agriculture, Engineering, Humanities and Education, Law, Medical Sciences, Science and Technology, Social Sciences, and Sport (UWI 2021).

Mirroring the lead of other regional campuses in Mona, Jamaica, Cave Hill, Barbados, Five Islands Antigua, and the Open Campus, The UWI St Augustine Campus initiated a proactive, progressive response to the COVID-19 pandemic with the launch of multiple initiatives that were focused on giving priority to the health, wellness, and safety of the campus and the wider Caribbean community. This first indication of commitment was the immediate activation of a campus incident management team (IMT) and the development of a COVID-19 response plan. A centralised webpage (UWI St Augustine 2020a) was quickly established as an online resource to provide a trusted source of relevant information on the campus' response to the coronavirus. Select key COVID-19 initiatives adopted at The UWI St Augustine Campus are highlighted in the following section.

A UWI press release, *Launch of the UWI COVID-19 Task Force on 29 February 2020*, announced the launch of a UWI COVID-19 Task Force (UWI St Augustine 2020c). Prof Clive Landis, Chair of the Task Force stated, 'It is right that The UWI should deploy its full expertise as a public academy to help Caribbean communities cope at this instance of the COVID-19 epidemic. The primary emphasis of the COVID-19 Task Force will be to provide accurate and reliable information' (UWI St Augustine Campus 2020/21c). Membership of the Task Force was drawn from the regional UWI campuses (including the St Augustine Campus and Open Campus), and comprised multi-discipline specialists, scientists, researchers, and public health professionals with combined expertise in virology, epidemiology, laboratory diagnostics, critical care, respiratory medicine, veterinary medicine, tourism, trade, international relations, and communication (UWI St Augustine Campus 2020/21c). The AJL, in partnership with The UWI Marketing and Communications Office developed scholarly profiles in the university's research management information system *UWIScholar*, for members of the COVID-19 Task Force team of experts. These profiles provided brief biographical information on each researcher and highlighted their record in research, university/public service, and professional endeavours.

With regard to the online delivery of essential services, the business continuity necessitated that the Campus had to migrate from face-to-face to online mode. In this regard, staff – administrative, professional, and teaching staff – were encouraged to engage in campus-wide training efforts aimed at the delivery of essential services, including teaching and learning in an online/blended model. The Centre for Excellence in Teaching and Learning, located on the St Augustine Campus, was one of the designated departments which was instrumental in delivering webinars and other learning opportunities to facilitate this move to online delivery.

As a key collaborator in partnership with the government of Trinidad and Tobago in the national response to the pandemic, The UWI St Augustine Campus approved the use of three quarantine/step-down facilities: Two Halls of Residence – Canada Hall and Freedom Hall – and the South Campus located in Penal-Debe, as quarantine/step-down facilities for returning students and citizens requiring access to such locations in accordance with the national guidelines.

The AJL, The UWI St. Augustine, COVID-19 Response

The UWI Campus Libraries consist of a network of libraries across the St Augustine Campus. The AJL is one of the largest libraries in the network with hybrid holdings of print and electronic resources and a West Indiana and Special Collections division noteworthy in its efforts as a repository of international

significance for research on West Indian-related topics. Sustained efforts at 'continuous upgrade and expansion of the Libraries' technological capacity over the past decade has created a robust and stable online platform' which provides access to resources for key stakeholders (Soodeen 2013). In 2008, the campus libraries' first venture into digital scholarship resulted in the launch of an institutional repository branded as *UWISpace*, built on the DSpace platform, which in 2012, was adopted as the regional institutional repository for all The UWI campuses. Other digital initiatives followed, including the deployment of a unified e-information portal, UWI*linC* and research information management system, *UWIScholar* and the establishment of an open-source platform, and Open Journal System to provide online access to university-published journals.

On 13 March 2020, the St Augustine Campus declared the closure of the campus and indicated that in keeping with national guidelines, all classes would be suspended. By 23 March 2020, although most campus departments (including the AJL) remained closed, classes had resumed for most programmes, but in virtual mode. The AJL reopened in a limited capacity on 20 July 2020, and on 14 September 2020, teaching commenced in full virtual mode for the academic year 2020/21. To date (December 2020), the campus remains closed for access by students and the public.

During this period of lockdown and limited access, staff at the AJL continued to work in dual mode, on-site and remotely, to support the campus' teaching, learning, and research needs. The shift in operations from primarily on-site and face-to-face to remote and online has required some changes:

- Academic librarians engaged in professional training and development by attending local, regional, and international virtual conferences, webinars, and workshops to ensure that they are up to date with the resources, tools, technologies, and best practices needed for the virtual environment.
- Upskilling of support staff to provide greater support in the virtual environment.
- The library's website homepage was reorganised to offer quick access to key updates on facilities, resources, and services.
- The lending and return of materials now primarily take place off-campus via a 'request and pick up service.'
- An online payment system has been launched to facilitate the payment of fines and fees for photocopying, scanning, and other services.
- Orientation, information literacy sessions, as well as reference and research consultations, are offered via virtual platforms such as Blackboard Collaborate, Google Meet, Skype, and Zoom.
- A virtual chat service (*Ask Us*) and frequently asked questions (FAQs) knowledge base, leveraging Springshare's LibAnswers and LibChat

platforms, have been launched to enable users to ask, receive, and locate quick responses to their reference and research questions.
- In-house developed handouts, online research guides, and videos are guiding patrons on facilities, resources, and services.
- The promotion of all library services developed in response to COVID-19 is driven via the library's website, research guides, Facebook page, and other communication channels.

The UWI Open Campus and the Open Campus Libraries and Information Services Covid-19 Response

The UWI Open Campus COVID-19 Response

The UWI Open Campus, established in 2008, is a multi-mode campus that offers online, blended, and face-to-face programmes at the pre-university, continuing and professional education, undergraduate, and graduate levels (UWI Open Campus 2014:3, 5-6, 8-9, 11) to approximately 16,000 students, with 42 site locations, in 17 English-speaking Caribbean countries (UWI Open Campus 2021).

The UWI Open Campus, like its sister institution at the St Augustine Campus, and other institutions of higher education, had to confront and adapt with alacrity to the social, economic, and health impact of the COVID-19 pandemic. For the Open Campus, crisis management of this nature was not unusual, as there have been intermittent periods of disruption to services precipitated by hurricanes, storms, floods, and other natural disasters. During these periods requiring crisis management, business continuity has always been viewed as paramount to ensuring the seamless continuation of operational objectives to a geographically dispersed campus community. This *modus operandi* has been a mainstay of the Open Campus since it opened its doors in 2008 to 'life-changing learning.'

In March 2020, in response to mandates by regional governments to institute national (country-wide) lockdowns as a result of the pandemic, mitigation measures were initiated at the Open Campus to alleviate major disruptions and maintain essential operations. This plan of action was aptly conveyed in a *We Got This* campaign, launched by the campus' Marketing and Communications Department, signifying that for the Open Campus, a response to the pandemic was aligned to conducting 'business as usual' with integrated calculated changes to all stakeholders. Implemented measures were developed primarily for stakeholders in need of on-demand training to facilitate the transition from face-to-face to online delivery of teaching and learning. Towards this stipulated end, training sessions were conducted

with the use of Blackboard Collaborate (video conferencing tool) and Moodle (Learning Management System) for faculty and staff at regional campuses at Mona, Jamaica, Cave Hill, Barbados, St Augustine, Trinidad and Tobago, and Five Islands in Antigua. Open Campus staff wishing to work remotely were able to take advantage of flexible home-based work arrangements, while staff and students had access to COVID-19 counselling support systems. In a speech delivered during World Quality Day on 12 November 2020, the deputy principal of the Open Campus, Dr Francis Severin described this resilient support in the midst of the pandemic, as the Open Campus continued 'commitment to fulfilling operational mandates' (Severin 2020:3) of The UWI Triple A Strategy 2017-2022, and fittingly opined that this collective response was a demonstration of 'UWI Open Campus sailing over [the] COVID wave' (Severin 2020:3).

Open Campus Libraries and Information Services COVID-19 Response

The OCLIS is integral to teaching, learning, and research within the Open Campus network, and is perceived as an intellectual hub, serving students, tutors, and staff at dispersed geographic locations within the Caribbean and wider region. The OCLIS and its cadre of committed staff support the pursuit of academic goals and the achievement of academic success in multiple ways, providing access to resources (print, electronic, digital, open access, and open educational resources) through a unified e-information portal UWI*linC*, offering reference and research assistance through its *Ask A Librarian* virtual reference service, assisting academic units in programme planning, development and delivery, and facilitating orientation sessions and information literacy workshops in online, face-to-face and blended delivery modes to enable students, staff, and other users to become proficient users and evaluators of information.

As seen above, the AJL, acting in accordance with other academic libraries similarly affected by the pandemic, was compelled to make a significant shift from in-person to an online delivery of services. At the OCLIS, however, although there were some changes in the service model to users, this was not as extensive, as was the case at the AJL. For the OCLIS staff, the pathway to follow in the midst of a pandemic was evident: Follow the lead of the parent institution, the Open Campus, to ensure business continuity and operational consistency in maintaining current online offerings, while adding enhanced programmes, services, content, and collections, as required. The following points describe OCLIS' COVID-19 response:

- *Orientation and information literacy sessions*: Continuity was key in ensuring the sustained commitment to supporting online teaching, learning, and research. All library face-to-face orientation and information

literacy sessions were transitioned to online in synchronous and asynchronous modes.

- *Reference and research*: Reference and research assistance were offered to staff and students utilising multiple communication channels – e-mail, Skype, Zoom, WhatsApp, as well as mobile and VoIP phones.
- *Virtual reference service*: Recognising the need for the deployment of an extended virtual reference service for remote users, the OCLIS expanded its *Ask A Librarian* virtual reference service to 42 hours per week (an increase of 12.5 hours above the 29.5 hours previously offered). Implemented in 2015, this service continues to operate as an essential online platform, supporting reference and research and the enhancement of digital literacy skills for the Open Campus community.
- *Program/Course consultation*: OCLIS librarians are fundamental to the process of communication and consultation with the Open Campus' academic departments in the planning, developing, and delivering of programmes. One such programme for which librarians provided developmental assistance was a postgraduate diploma in Health Research and Epidemiology. This diploma was viewed as beneficial to health practitioners and essential to offering health services during the COVID-19 pandemic.
- *Professional development*: A series of webinars on the topic of the *Pedagogy of Online Learning* were delivered to staff to facilitate the seamless transition to full online delivery of library programmes.
- *Dissemination of COVID-19 related content*: 'Critical thinking is a key skill in media and information literacy, and the mission of libraries is to educate and advocate its importance' (IFLA 2017). This skill gained importance during the pandemic, as libraries witnessed an increase in the distribution of fake and misleading news in some media channels. The dissemination of legitimate news sources with related COVID-19 content on health and wellness, via an OCLIS-crafted online newsletter, was operationalised. This newsletter, along with an online information guide, highlighted expanded vendor subscription offerings and access to free online resources.

Covid-19 and its Impact on the Adoption of 4IR and other Technologies at the Alma Jordan Library and Open Campus Libraries, and Information Services

4IR Implementation at Libraries – An Overview

During the global pandemic, institutions of higher learning around the world discovered that in challenging times, opportunities abound to add value to current services, while engaging clients to seamlessly transition to operating

in a blended environment (online and face-to-face) from on-site and remote locations. The Vice-Chancellor of The UWI, Prof Sir Hilary Beckles affirms this engagement in the following comment: '[T]he pandemic has allowed us to embrace the technology and the future, we have had to do in the last six to nine months what we have been trying to do in the past six to ten years, and so in a short time, we were able to move speedily along into the future and we are not going back' (Mc Kenzie 2020).

As has been shown in the introduction to this chapter, this approach of embracing 4IR technologies has proven to be effective for other sectors – business, health, government, and education – and these sectors have been perceived as agile at harnessing the 4IR to deploy critical products and services, essential for survival during the COVID-19 pandemic.

The integration and implementation of 4IR tools have also enabled similar opportunities for libraries. In a COVID-19 world, librarians had to be on alert, adroit, and proactive in their efforts at embracing 4IR transformational innovations to fulfil a mandate of supporting the information needs of multi-generational clients. Supporting these diverse needs demanded a full-term commitment to learning new skills, with emphasis placed on critical areas such as 'information curation; in-depth research; digital scanning; preservation; Cloud data expansion; collaboration, teaching and facilitation' (Tella 2020:5). These skills are required to function effectively in a 4IR world, which as McGinnis (2020) cautions, is challenging our notion of what it means to be human and changing society like never before.

It is in recognition of this added value proposition of 4IR technologies adoption in libraries, that the potential benefits for integration of technologies, like AI, AR, VR, 3D printing, robotics, and the IoT at the AJL and the OCLIS are explored in the ensuing discussion. An exploratory examination of 4IR at other academic libraries was supplemented by an in-depth analysis of administrative university documents, the consultation of library literature, and the in-service experiences of the researchers and library colleagues. The researchers also sought to identify best practice recommendations for the present and future integration of 4IR technologies. This examination of existing models and future potential applications gives credence to the premise that such explorations should boost the AJL's and OCLIS' nascent efforts in this regard, and guide future policies and implementation strategies aimed at making these libraries and their parent institutions more relevant in a changing world.

The UWI AJL and OCLIS – Current 4IR Applications

AI is intended to create 'intelligent' machines that work and react more like humans. It has become very popular in recent times, finding mainstream acceptance in educational institutions, offices, and homes. In libraries,

discussions on the adoption of AI invariably drift toward the issue of whether such technology is, in fact, competing with the role of librarians in delivering information to stakeholders. Kristin Whitehair (2016) weighs in on this issue by pointing to the immediate disadvantage of AI in 'lacking human connection' and suggests that libraries offer inherent advantages as they 'can connect people to information and, more importantly, to other people.'

At the library of the University of Johannesburg (UJ 2021a), the deployment of a chatbot named *BOTsa* to respond to basic queries about the library such as service hours, access to wi-fi, printing services, online training, and booking library spaces is an example of an 'intelligent' machine at work. Contact information is on the library's website for facilitating advanced/complex queries that cannot be answered by the chatbot. This service ably demonstrates the enhanced opportunities that AI offers in expediting some basic processes while freeing up finite resources to focus on enriching the library experience for patrons.

A similar AI-driven service, the Alexa Skill (voice service) was launched by the AJL for the St Augustine Campus community as a pilot project in July 2019. This skill, which leverages Amazon's Alexa digital assistant, is named *My UWI Library* and facilitates the answering of FAQs about library facilities, resources, and services at the St Augustine Campus, and more specifically at the AJL (UWI St Augustine Campus 2019). Additionally, the service permits interested users to enable and access the skill on any Alexa device (UWI St Augustine 2019).

The pilot project principals, under the leadership of campus librarian Frank Soodeen (Jr), comprised an inter-departmental AJL team led by an AJL IT officer/applications developer. The *My UWI Library* Alexa Skill project is currently on halt due to staffing constraints, but the advent of COVID-19 and its impact on the library's offerings to patrons (which are constantly evolving), have renewed interest among library staff in resuming the initiative. The subsequent launch of the AJL's *Ask Us* live chat and FAQ services (powered by Springshare's LibChat and LibAnswers) in November 2020, are supportive of this resumption of the voice service, in that there is a rich source of new and updated FAQs that could be included in the *My UWI Library* database.

As is the case with the *BOTsa* chatbot, patrons can use smart devices like Alexa to discover information and generate quick responses on new library collections, programmes, and services. Both services at the UJ library and the AJL are excellent examples of AI at work in libraries, where intelligent digital assistants can respond to routine questions and redirect complex queries directly to a librarian. AI can also be integrated into the OCLIS' current *Ask A Librarian* virtual reference service and add value to this online platform,

providing continued support for the reference and research needs of the Open Campus.

The UWI AJL and OCLIS – Potential 4IR Technology Applications

- 3D Printing

The UWI St Augustine Campus joined a concerted global effort to combat the COVID-19 pandemic by partnering with external stakeholders to produce personal protective (and medical) equipment (PPE) for healthcare workers and the public. Projects included *Protect-a-Doctor* kits for use during the intubation process. The kits comprise, amongst other items, 3D printed laryngoscope blades. Engineers from the campus' Faculty of Engineering, encouraged by the campus Principal, Prof Brian Copeland, have led the way in these initiatives (UWI St Augustine 2020b).

To alleviate the ongoing health crisis globally, university libraries with 3D printers on-site are actively 'contributing to production efforts, working alongside engineering and health departments to create medical-grade equipment' (Balzer 2020). The University of Utah libraries have been using 3D printing for face shields and N95 mask production. At Columbia University, the library published a guide and design for producing face shields to be used by other libraries with access to 3D printers (Balzer 2020). Following the lead of these two universities, there is potential for The UWI libraries at St Augustine Campus to initiate similar collaborative projects with engineers at the Faculty of Engineering and contribute to production efforts in creating medical-grade equipment.

- Augmented Reality

AR technology, described as the technology available on mobile devices that 'allows users to experience a layered, computer-generated enhancement to their real-world perception' (Abram 2019) can provide new opportunities for librarians to develop engaging and interactive unmediated tours, inviting patrons to explore library spaces and service points. At the AJL and OCLIS, current efforts are focused on developing online video tours and embedding these videos in social media platforms and Learning Management Systems. These efforts are welcomed in a time when it is recognised that orienting patrons to library spaces, collections, and services is an important, but time-intensive challenge for many librarians when other tasks are equally demanding their attention. AR applications can enhance these learning opportunities, enabling the creation of engaging interactive programmes that connect patrons with context-specific information and facilitate seamless interaction between the real world and the virtual environment (LeMire, Graves, Hawkins, & Kailani 2018).

The Harrell Health Sciences Library at PennState College of Medicine in Hershey, Pennsylvania (US) currently offers a virtual library tour that employs AR functionality that the AJL can emulate. The interactive click-through tour facilitates the visual exploration of several library spaces, a service desk, collaboration workspaces, multimedia services, workstations, a recording studio, and a Technology Innovation Sandbox (PennState 2021).

- Virtual Reality

VR, unlike AR, which uses a real-world setting, is experienced within a simulated virtual environment, using special electronic equipment such as headsets and sensors. VR, like AR, can offer significant opportunities in the areas of adaptive teaching, learning, and research.

At The UWI St Augustine Campus, the Defensive Driving Simulation co-curricular course offers a 'virtual reality simulator [which] supplements theoretical instruction' (UWI St Augustine Campus n.d.). A similar approach was adopted at the VR lab, located in the Waldo library at the university libraries at Western Michigan University in the US. The lab is a designated creative space for faculty and students to explore and exploit VR technology and offers workshops and online tutorials for WMU students to experience both the entertainment and educational side of VR. Faculty, too, can access the facilities to learn how to integrate VR content into pedagogy and research (WMU 2021). At the OCLIS, there are plans, when grant funding is secured, to establish a similar prototype in the form of an AR/VR developer lab, offering similar teaching and learning experiences for library patrons to explore AR/VR and other 4IR technologies. Using such technologies, 'learners can develop scientific literacy, problem-solving skills, and content knowledge by interacting with simulated objects' (UWI 2019:5).

- Robotics

With the rise of the 4IR, 'many individuals across various sectors fear being replaced by technologies such as robotics and artificial intelligence' (IFLA 2020). Advocates for robotics make a case for the wide-scale deployment of robots, contending that as these machines become safer and assume more responsibilities alongside humans, people will be free to focus on performing complex and creative projects beyond the common ability of their mechanised counterparts.

At The UWI, St Augustine Campus, robotics form part of the curricula of both the Faculty of Engineering (UWI St Augustine Campus 2020/21a:50–51; 2020/21b:18, 83) and the Faculty of Science and Technology (UWI St Augustine Campus 2020/21c:166, 225). Indeed, the latter Faculty's Department of Computing and Information Technology has hosted an Annual Computing

Boot Camp, geared towards secondary school students, which has featured robotics as part of its activities (Mohammed & Ragbir-Shripat 2017:12).

For academic libraries, there is the potential of collaboration between lecturer and librarian in teaching computer science and using robots deployed in a learning lab as practical reinforcement of critical thinking and problem-solving skills for students, in effect working together, using pedagogical approaches (adaptive learning) to demystify robotics technology.

- Internet of Things (IoT)

'The Internet of Things, or IoT, refers to the billions of physical devices around the world that are now connected to the internet, all collecting and sharing data…connecting up all these different objects and adding sensors to them adds a level of digital intelligence to devices…enabling them to communicate real-time data without involving a human being' (Ranger 2020). The total number of 'Internet of Things (IoT) connected devices in use' is projected to amount to over 75 billion worldwide by 2025 (Statista 2016).

The *Book-O-Mat* automated book kiosk at the Hillsboro Public Library in Oregon, USA, harnesses IoT technologies 'to track usage, alert the library when restocking is needed, and identify popular selections for informed collection development' (ALA 2017). Located in a 'high-traffic, high-visibility location' (Washington County Reader Contributor 2019), the kiosk serves the dual purpose of increasing access to library resources without adding significant staff costs (Washington County Reader Contributor 2019).

Contactless services at libraries are guaranteed safeguards at maintaining the US Centres for Disease Control and Prevention (CDC) recommended guidelines on social distancing and less physical contact, the now required norms in a COVID-19 world (CDC 2021). The AJL has made some progress in the development of this type of contactless service for users, with the introduction in January 2019 of a self-checkout station in the lobby on the first floor of the library. In response to the heightened need for maintaining social distancing protocols and less contact with patrons, as libraries reopen their doors to offer full services, there is the potential for libraries, once the required funding is available, to upgrade to similar automated self-checkout kiosks and explore the full benefits of other time-saving applications such as Radio Frequency Identification.

The commercial juggernaut, Amazon has already made rapid strides in merging disparate technologies – computer vision, sensor fusion, and deep learning algorithms – to create this type of desired unique contactless user shopping experience with a service called the *Amazon Go 'Just Walk Out Shopping Experience*.' At selected Amazon stores, customers walk in, select products that they need off the shelf, and walk out. There is no need to wait in

long lines, and there are no registers or checkout counters. All that is required for the purchase is the *Amazon Go* app and an Amazon account (Amazon 2021). Using similar technology, with inbuilt checks and balances to protect patrons' privacy, library prototypes can be developed for 'on the go patrons' with a potential implementation at the AJL and landed sites libraries at the OCLIS in the future. This marks progression towards the touted re-imagined post-COVID-19 library which can be branded and promoted as the *Just Walk Out Library Experience*: Walk-in, select items, walk out, no checkout!

Recommendations for Implementing 4IR in Libraries

In adopting 4IR technologies amid a global pandemic, librarians are often faced with the dilemma of choosing the best-fit technology options to meet their community needs. Developing a best practice model is one solution that librarians can adopt to circumvent the pitfalls of choosing the inappropriate optimal technology at the workplace. This method of best practice, if adopted, can produce programmes, products, and services that allow for the seamless integration of 4IR technologies and engaging experiences for library patrons. The following best practice recommendations offer instructive insights which are obtained from consulting library literature (Library of the Future 2021; Chigwada & Nwaohiri 2021; Waite 2018):

- *Set 4IR technology goals*: Conducting a comprehensive evaluation of technology needs in the workplace with strict adherence to organisational goals and gathering in-depth knowledge and understanding of the needs of the communities being served. View this 4IR initiative as a project, setting SMART (specific, measurable, achievable, realistic, and timely) goals.
- *Review budget options* by giving consideration to applying for technology grants to supplement library budget allocations.
- *Identify flexible multifunctional spaces* within the library to house technology devices and consider a multi-mode delivery of programmes (face-to-face, online, and blended modes).
- *Engage in a process of obtaining staff commitment and 'staff buy-in' to IT projects* by ensuring that there is acceptance, enthusiasm, and support for projects among staff. Additionally, provide the required training before launching programmes.
- *Commence with a pilot* of the identified project, focusing on a targeted group of patrons for a small-scale rollout.
- *Leverage local vendor/stakeholder partnerships* for much-needed resources and engage in strategic alliances with technology giants for early access to prototypes of products and services.

- *Promote services* by marketing new services on social media and other communication channels to expand community outreach and promote engagement.
- *Offer classes on digital privacy* as it is imperative that libraries, when rolling out 4IR services, recognise and address associated issues of ethics, security, and digital privacy. Library consultant, Mary Ellen Bates (2019) proposes that this can be done by adopting a proactive approach and urges librarians to adapt to the role as 'digital privacy infomediaries,' leading digital privacy discussions at their institutions. Librarians are also charged with a designated teaching role in educating patrons on topics such as enhancing personal security online and safeguarding personal data online (Bates 2019:5).
- *Give consideration to the development of virtual learning hubs* as platforms for librarians and patrons to gain in-depth knowledge and an understanding of established and emerging 4IR technologies. The UJ library is a designated 4.0 library and as such, developed an *innovative learning hub* as a searchable online platform where patrons can utilise a customised Google Search engine to access information on key 4IR concepts such as VR, AR, mixed reality, and AI. Patrons can also search the platform for instructional and educational resources, to support and enhance teaching, learning, and research relevant to the UJ community needs (UJ 2021b).

Conclusion

This chapter has indicated that the COVID-19 pandemic has drastically changed existing societal norms, ushering in a new environment described as the 'new normal,' changing the way we live, learn, work, and communicate. Libraries have followed in lockstep with other sectors – business, government, health, and education – in adopting 4IR technologies such as VR and AR, AI, 3D printing, robotics, and IoT to re-engineer operations and provide supportive services for teaching, learning, and research, all in an attempt to return some semblance of normalcy to existing library operations while adhering to strict, newly implemented health protocols and national guidelines.

The chapter highlighted the existing and potential applications of 4IR technologies at the AJL, St Augustine, Trinidad and Tobago, and the OCLIS at The UWI. The small-scale adoption of these transformational advanced technologies at The UWI libraries has demonstrated that librarians are aware of the need to be in responsive mode in a reimagined future, agile and adept at mastering new age technological skills to proactively roll out ground-breaking services during a global pandemic. Projects for short-term implementation include the AI-driven deployment of a digital assistant at the AJL, responsive to first-line queries. Potential 4IR driven services for further in-depth

examination and exploration include self-mediated VR/AR tours to enhance students' adaptive, experiential learning and digital fluency; the development of VR labs and the engagement of robots to support teaching and learning; the use of IoT to leverage collection development opportunities; and 3D printing support facilities in libraries for the production of PPE and other medical equipment. These exploratory studies show demonstrable evidence that The UWI librarians, like their global contemporaries, are in a future-focused mode, preparing for library operations and services in the 'next normal.'

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Smart Academic Libraries

Possibilities Through the Application of the Internet of Things

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UNISA

Abstract

Internet of Things (IoT) technologies provide the opportunity for hybrid and digital academic libraries to move towards offering smart library services and access to resources. Within the context of higher education, smart academic libraries are new generation libraries that utilise smart technologies to offer library services and access to resources that are innovative, creative, and infused in technological advancements. Within the context of the Covid-19 pandemic, many higher education institutions revised their modes of teaching and learning towards a hybrid, blended, or even online approach. This forced academic libraries to consider alternative ways of offering information services and resource support. One of these alternatives relates to the use of IoT technologies to create smart academic libraries that can offer varied services and resources, using radio-frequency identification technology, sensors, cloud computing, and artificial intelligence. By following a bricolage design within the constructs of interpretivism, views from different authors were considered to propose an IoT architecture and possibilities towards promoting smart academic libraries. The conceptual relatives theory was used to propose ways in which IoT technologies can be utilised to apply smart technologies, develop smart users, offer smart services, and promote smart governance in an endeavour to reconstruct academic library services that are intelligent, flexible, autonomous, and adaptive. It is envisaged that smart academic libraries will support the creation of a teaching and learning environment where students, academics, and researchers can acquire competencies towards personal and professional growth and development.

Keywords: Internet of Things; smart academic libraries; accessibility; interoperability; architecture

Introduction

The Covid-19 pandemic has blindsided academic libraries (Cox 2020). Because of the speed of transition which was required to remotely offer library services and to ensure access to printed and digital/digitised resources, many academic libraries found themselves unprepared for the urgency with which they had to adapt their services to support higher education endeavours. Within the context of the Covid-19 pandemic and changes to the scope and context of higher education academic offerings, tools and methods used by traditional academic libraries to provide library services were unable to offer access and support to students, academics, and researchers (Chen 2019). Aligned to the fifth law of library science, as stated by Ranganathan in 1931, that libraries as growing organisms should grow and expand, Makori (2017) proposes a transformation through the utilisation of IoT technologies to develop smart academic libraries. This view is reiterated by Moyane, Dube, Nkomo, and Ngulube (2020), who explain that academic libraries must transform to the point where they are able to drive and support strategic changes that influence teaching, learning, and research within their institution. However, embarking on this transition may be easier said than done, considering the globalisation of information supply by the internet, inadequate budgets, increased open access resources, and the need to justify the value of academic libraries in a constantly changing higher education environment (Makori 2017). Towards searching for opportunities to become more flexible and robust, Raju, Claassen, Adam, Dangelo, Keraan, Mostert, and Vonk (2018) propose that academic libraries should consider alternative ways in which to offer services within the South African higher education context. Technological advancements offer opportunities to reshape the focus of academic libraries and its context within higher education organisations and offer a new layer in supporting changes related to the higher education landscape. Yusuf, Ifijeh, and Owolabi (2019) argue that the application of the IoT provides opportunities for academic libraries to improve access to library resources, collection management, information literacy, location-based services, and recommendation services. The views of Yusuf *et al.* (2019) align to that of Wójcik (2016), who explains that the IoT as an emerging technology can be used to support and expand a variety of academic library services, including ease of use, constant contextual assistance, access, and authentication, as well as personalised library services. Linked to the IoT, smart academic libraries refer to libraries that are 'intelligent, self-renewing, flexible, functional resilient, autonomous and adaptive' (Gul & Bano 2019).

Within the above context, the aim of this research is to examine how the IoT can be used to compose smart academic libraries that are able to cater for user needs and expectations, particularly given the changing teaching,

learning, and research environment brought about by the Covid-19 pandemic. As smart libraries are becoming increasingly important channels for accessing information, the importance of such libraries cannot be underestimated (IFLA 2020). Smart academic libraries offer their users seamless services through the application of various technologies in personalised and innovative ways (Simović 2018). As part of the Fourth Industrial Revolution (4IR), the IoT is one of the technologies that offers the broadest opportunity for academic libraries to supply information resources to students, academics, and researchers by following a smart approach.

Contextualising the Problem

The importance of academic libraries in higher education cannot be denied. As explained by Das (2017), quality education is impossible without quality library services and resources. This view supports the notion by Mahesh (2016) that the purpose of academic libraries to organise, preserve, and make information accessible, places prominence on the supporting role of academic libraries to achieve the core mission of research and education associated with higher education. As per the Committee of Higher Education Libraries of South Africa (CHELSA) (CHELSA 2019), academic libraries must be respected as a partner in teaching, learning, and research. Support must be offered to all role players to discover, access, and use information and knowledge resources towards academic prowess, research, and lifelong learning. Such access, according to CHELSA (2019), should encompass the retrieval of physical and virtual resources to ensure the optimal discoverability of information resources. However, CHELSA maintains that the relevance of academic libraries may be questioned within the Covid-19 era. Changes made to the delivery of teaching and learning practices create tension with regards to the way in which academic libraries offer support to promote higher education endeavours (Chisita & Ukwoma 2021).

Limitations to physical access to library resources and services because of Covid-19 lockdowns and distancing requirements, triggered a need for academic libraries to rethink and consider innovative ways to continue to provide services to users. Innovation in the offering of library services and resources require, according to Raju and Claassen (2017), a proactive collaborative transition where library services and access to resources are dynamic and agile, to support the transition towards online, blended, or a hybrid provision of educational activities. Blended educational activities refer to the combination between offline and online academic engagements, whilst the concept of hybrid educational activities focusses on utilising a variety of teaching and learning modes of engagement to support the needs of individual users. The need for the urgent precipitation of academic library services to offer

virtual resources and services in support of academic activities is emphasised by CHELSA. According to the findings of the 2020 CHELSA research, access to the entire scope of academic library services should be moved to a virtual environment. The importance to offer library services through technological advancements that cater for user needs and promote the importance of academic libraries as a key support service towards academic prowess, was not only mentioned in the CHELSA report (CHELSA 2020), but also by authors such as Cox (2020), Farzand and Saleem (2020), Chisita and Ukwoma (2021), and Martzoukou (2021).

Nicholson (2020) explains that events related to the Covid-19 pandemic forced information professionals to speed up the transition to offer services via technology platforms as a matter of urgency. However, Cao, Liang, and Li (2017) state that the utilisation of technologies in and of itself is not sufficient to cater for embedded changes to the academic library environment. Technologies such as the IoT should be used to create smart academic libraries that are capable of automatically capturing the needs of users and provide resources and services to meet those needs. As an advanced version of a hybrid or digital library, a smart academic library should rely on intelligent equipment to support the offering of intelligent services to users (Wu 2012).

Within the above context, the aim of this chapter is to explore key considerations to create smart academic libraries through the IoT. More specifically, the chapter intends to focus on the IoT as it relates to smart libraries, provides foundation information on the architecture of the IoT to consider within academic libraries, and based on the conceptual relatives theory, offers possibilities related to the application of the IoT to create smart academic library services and resources.

Methodological Approach

Sound methodological principles are required to explore possibilities for academic libraries to transform their services and resources to become smart, i.e., innovative, enriching, interactive, and exciting. Exploring the use of the technologies related to the 4IR, such as the IoT, influenced my preoccupation with possibilities that academic libraries can consider towards creating smart library services. By following an interpretivist paradigm, the topic was explored through subjective meaning-making, aligned to the experiences and viewpoints of national and international authors. Because reality is socially constructed through interpretivism, individuals involved in research develop and put forth subjective meanings of their experiences, through their own contextual understanding and as it relates to the viewpoints of others (Creswell & Creswell 2018). Linked to the ontological perspectives of interpretivism, the bricolage design provides the lens through which an epistemological

approach can be constructed to explore the topic of the IoT to compose smart academic libraries. As per the view of Yee and Bremner (2001), the bricolage design allows for the collection of rich data from existing literature to be used towards suggesting new knowledge. Kincheloe (2004) explains that the bricolage design neither searches for new tools, nor does it follow a linear plan to conduct research. Existing content is rather utilised to propose innovative insights and new understanding.

Contextualising existing content to come to insightful conclusions require, within the context of interpretivism, and utilising the bricolage design, that a theory or model be used to provide the academic foundation to allow the transformation of information into knowledge (Du Plooy-Cilliers 2014). Loosely founded on the *conceptual relatives* theory towards smart libraries, proposed by Cao *et al.* (2017), the dimensions of the theory relate closely to key components namely technology, people, and service. A similar theory by Schöpfel (2018) proposes that in the development of smart libraries, consideration should be given to dimensions such as technology, people, and services, along with a fourth dimension, which is smart governance. Diagrammatically, the key dimensions of the conceptual relatives theory as it applies to this research, is presented in figure 1:

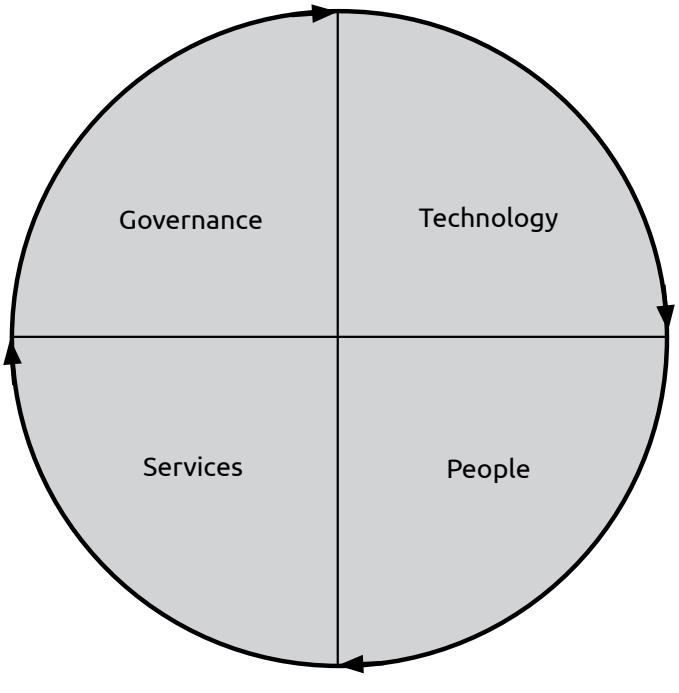

Figure 1: Conceptual relatives theory towards smart libraries (Personal archive; based on the views of Cao et al. 2017).

The *technology dimension* requires of a smart library to encompass an information service system based on electronic communication and computer processing technology (Cao *et al.* 2017). The technology dimension aims to build intelligence by utilising machines and programmes to respond to user queries and accessing resources through word matching. The *service dimension* relates to creating a library space and service model that offers support and interactivity between users and library services. Characteristics of the service dimension of smart libraries include fusion, interaction, visualisation, and ubiquity, specifically relating to offering open, multi-format, and multi-language services (Schöpfel 2018). In terms of the third dimension, smart libraries should offer opportunities for the development of *smart users* who are able to access resources and services through a variety of technological tools such as smartphones, iPADs, really simple syndication, android platforms, international organisation for standardisation platforms, or any integration of various technologies (Cao *et al.* 2017). Smart governance, according to Schöffel (2018), relates to increased transparency and the engagement of users and library staff in shared decision-making. This often requires a real-time analysis of library services usage to improve strategies based on collective intelligence. As the establishment of smart academic libraries require attention to these four dimensions, interoperability among these dimensions is necessary to ensure that smart academic libraries support higher education endeavours related to teaching, learning, and research.

The IoT Related to Smart Libraries

Nag and Nikam (2016) explain that a new era of technology may provide answers to offering academic library services in an innovative and smart way. According to the authors, the IoT, which forms a network of connections to share information through the sensing of objects linked to the 4IR, offers academic libraries the opportunity to mirror the virtual environment with users' knowledge of a physical academic library, to support and expand the extent of services that can be offered. The IoT was first coined by Kelvin Ashton, a British technology pioneer who used sensors and actuators to connect objects using radio-frequency identification (RFID) technology (Jiang, Xu, Zhao, & Chen 2019). According to Hoy (2015), the IoT comprises of three pillars which are required to ensure interconnectivity between objects: Objects must be identifiable, able to communicate, and interact with one another. The principles of the IoT are based on the view that physical and virtual things have identities and that these identities can be used as intelligent interfaces to generate and integrate information into a network where data and information between and among objects can be shared (Makori 2017). Gul and Bano (2019) add that through interconnectivity, autonomous and secure

connections between objects can be achieved to promote the exchange of data. Linked to academic libraries, the IoT focuses on using technologies that can enable identification, communication, and interaction over networks without human interventions, to offer improved services and access to information resources (Hou, Yang, Chen, & Yu 2019).

The IoT is continuously emerging to connect our physical world with the virtual environment. Lueth (2021) states that the most recent developments within the 2021 annum relates to the expansions of IoT technologies to include 5G and the artificial intelligence of things (AIoT). The AIoT is seen as a radical transformation on how we interact with devices and objects around us. As explained by Ghosh (2020), the AIoT is based on programmable intelligence that will enable devices to learn, reason, and process information like humans. Linked to the 5G, connectivity devices will be able to communicate at a near-zero latency rate in real time, so that volumes of data from numerous sources can be shared. Though more research is required on the way in which AIoT may be utilised towards expanding academic library services, its impact on such library services will be immense, according to Bunz and Janciute (2018). AIoT objects will be able to perform services which were not possible before, by seeking, tracking, and processing gathered information through the ability to process language and images to make autonomous decisions. Changes may relate to keyword searching and the semantic analysis of web content; integrated speech recognition; machine translation to support real-time multi-language translation; and cloud services for the identification of diverse and complex web content.

As a key resource to support the transformation of higher education from face-to-face to blended, hybrid, and eventually artificial intelligence (AI), Yu, Gong, Sun, and Jiang (2019) explain that within the context of using modern technologies such as big data, the IoT, cloud computing, RFID, and virtual realities, academic libraries may be transformed to create smart libraries that are able to provide users with more efficient and high-quality services. Within the context of using IoT technologies, Schöpfel (2018) elaborates that the term 'smart' refers to efficient, sustainable, equitable, and interconnected. Technologies such as the IoT may thus be used to create an academic library infrastructure of components and services that are intelligent, interconnected, and efficient. However, Zhuang (2021) warns that irrespective of technology evolution and usage, library principles must always be considered in terms of people oriented, reading-centred, and service-oriented focus. For Yu *et al.* (2019) it is therefore important that academic libraries use technologies related to RFID, the IoT, image and speech recognition, and other AI technologies to offer a holistic composition of services. Similarly, Gul and Bano (2019) argue for the use of technology tools to offer services in an intelligent and personalised manner through the exchange of data-sharing. The aim of a smart library must

therefore be to ensure that all elements and activities of the library become 'smart,' in order for technologies, services, and user-oriented dimensions to be intelligent and self-renewing to offer a wide range of opportunities for searching, retrieval, and engagement, using complex hardware and software capabilities (Cao *et al.* 2018). As purported by Pujar and Satyanarayana (2015), the creation of smart academic libraries through the application of the IoT can enrich the experiences of library users to connect with information in ways that were hitherto not possible.

Internet of Things Architecture within the Context of Academic Libraries

As described by Jiang *et al.* (2019), the IoT is not a single technology but an accumulation of various technologies that function in unison to support communication and the exchange of information among objects, the environment, and humans. The basic set of technologies that is needed for the IoT to function effectively refer to RFID, wireless communication devices, sensors, cloud computing, and advanced Internet Protocol (IP) (Chen 2019). In addition, Xie, Liu, Zhu, Chong, Shi, and Chen (2019) suggest that other technologies should be incorporated as part of the IoT to expand its functionality and relevance. These may include near-field communication (NFC), low-rated wireless personal area networks, Bluetooth, wireless fidelity (Wi-Fi), worldwide interpretability for microwave access (WiMAX), mobile communications, and wireless sensor networks (WSNs). Gul and Bano (2019) state that for academic libraries to become smart, technologies related to electronic resource management, digital asset management, and institutional repositories should also form part of the technologies to be linked to the IoT. Cao *et al.* (2018), Gul and Bano (2019), and Xie *et al.* (2019) propose that IoT technologies used within a smart library context be divided into three layers to ensure that all technology is in place to convert a hybrid or digital academic library to a smart academic library through the application of the IoT. These three layers are the perception layer, the device and network/computing layer, and the access/discovery layer. Diagrammatically the three layers and technological tools applicable to each can be presented as per figure 2.

In terms of the perception layer, there are key technologies that should form the foundation of the IoT architecture. Of these, the RFID is probably the most important (Yusuf *et al.* 2019). The RFID encompasses tags with built-in integrated circuits that can store information and includes an antenna to receive and transmit signals. RFID tags are miniaturised to a few millimetres in length and width, which enable it to be linked to everyday objects (Cooper & James 2009). The RFID tags are activated by radio waves which communicate wirelessly with the tags. These radio waves are used to transfer data from

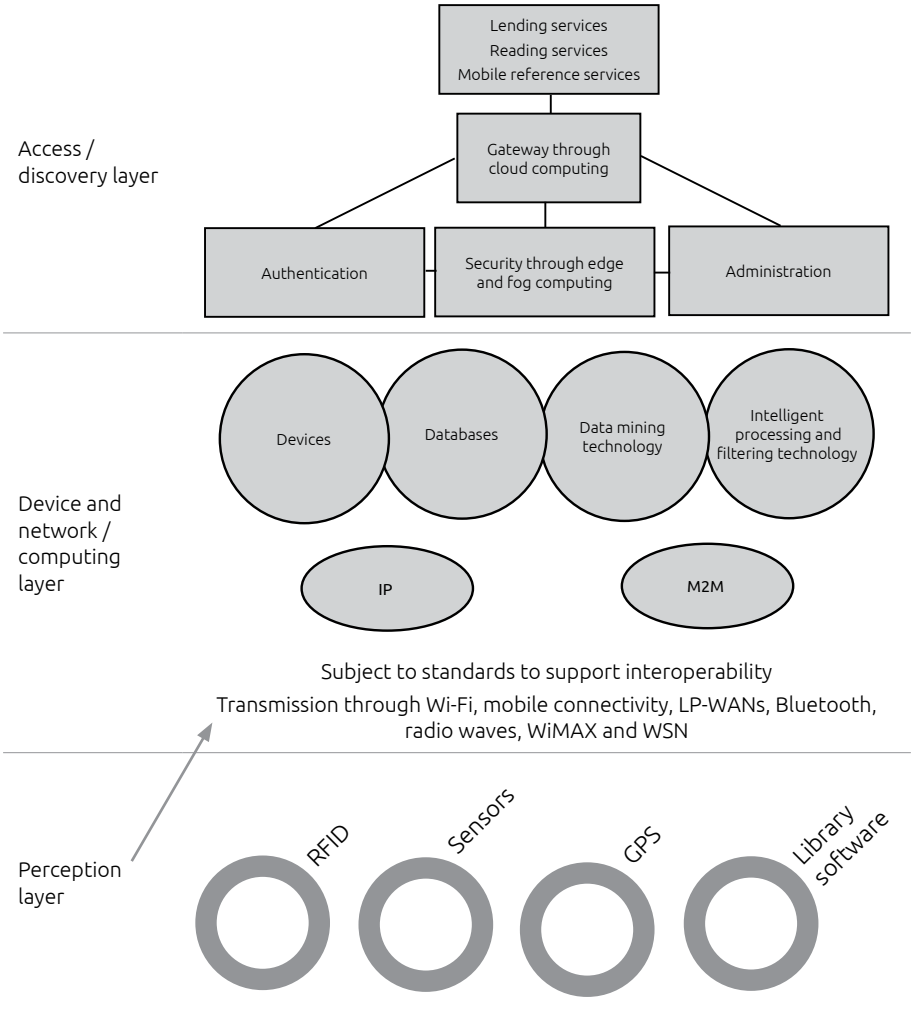

Figure 2: Graphical representation of architecture of the IoT related to smart academic libraries (Personal Archive).

the RFID tags for automatic identification and tracking of objects. In this way RFID tags act as 'smart' signatures that transmit information to radio-frequency readers (Shepard 2018). Using RFID technology, objects can be 'sensed' through low-power, ultra-high frequency sensors used for gathering data from objects (Mulloni & Donelli 2020). These sensors can be managed through cameras, GPS, and other smart sensors to identify and locate objects. Sensors are used within the IoT construct as an inexpensive way to turn objects in academic libraries into 'smart' objects (Rajapaksha 2020). Within the environment of academic libraries, Sheeja and Mathew (2019) explain that

RFID technology linked to sensors can be used as a tracking device for books on shelves. In this way the misplacement of books can be eliminated as the use of RFID tags linked to a positioning system and NFC through Wi-Fi or mobile connectivity can ensure the quick and easy tracking of books.

Connected to the perception layer, Chen (2019) as well as Costa, Genovesi, Borgese, Michel, Dicandia, and Manara (2021) explain that a variety of methods can be used to transmit RFID information related to objects, inclusive of low-power wide-area networks (LP-WANs), Bluetooth, Zigbee, WiMAX, and WSNs. Data that were stored and made accessible via these networks require the use of protocols to enhance transmission. Such protocols can include interoperable communication protocols, security protocols, interface protocols, and internet protocols (Liu & Chou 2018). Hoy (2015) states that protocol standards are imperative to ensure full interoperability between objects linked to the internet. The Zigbee Alliance has for example produced a set of standards for the creation of WSNs (Cooper & James 2009), whilst standardisation of machine-to-machine communications (M2M) has secured the establishment of technical standards for interoperability related to architecture, security, and machine-to-machine reading (Mehmood, Ahmad, Yaqoob, Adnane, Imran, & Guizani 2017; Zhuang 2021). Of particular importance to offer smart library services and resources, is the IP. Objects connected to the internet require a unique identifier to ensure interoperability. Currently the IPv6 is applied to provide each object with its own unique IP address. IPv6 uses a 128-bit address (Liang & Chen 2018) to provide a unique identifier to each object linked to the internet. Through RFID technology, the unique IPv6 address of each object can be identified and by using sensors, data related to the physical or virtual states of objects can be traced. Such data is stored via cloud computing to enhance interoperability (Yan, Huang, Luo, Gong, & Yu 2018). Coupled with blockchain technology (also linked to the 4IR), data can be time-stamped to provide the validity and reliability of information available via the cloud (Gul & Bano 2019). Blockchain creates unique, verifiable records that can be tied to digital material and used to show provenance of records and data (Bhatia & Wright de Hernandez 2019).

A well-constructed IoT architecture will, according to Xie *et al.* (2019), ensure that various objects within an automated system are able to communicate and exchange real-time data and information among people and people, people and objects, and objects and objects. Data mining is required to enhance such communication by analysing and processing large data/information repositories to discover potentially useful information (Chen 2019). Data mining can be used in smart academic libraries to collect data from library collections and users to create patron-driven acquisition and recommendation resources within library holdings to users. Gul and Bano (2019) are of the opinion that data mining is imperative in providing

individualised intelligent smart library services based on knowledge of user needs and interests.

Contextualised within the access and discovery layer, Yan *et al.* (2018) propose that privacy issues be considered and built into the administration and authentication of library services and resources. The authors propose three layers of privacy, namely edge computing, fog computing, and cloud computing. Edge computing is required to link all objects with RFID tags with spyware to protect devices from security attacks. Fog computing comprises software defined networking controlling clusters, stored on application servers, where data is processed (Zhuang 2021). This level of security provides a low latency, high-quality service, to detect and limit attempts to access objects that are not available via the internet. It is only once objects are made accessible via the cloud computing space, that such data and information become detectable and discoverable. Security measures through, for example honeypots, should be programmed into the cloud computing space to prevent unauthorised access. It is also from this cloud computing space, where users or objects can discover data and information which are related to other objects available via the IoT. In this way the cloud computing space becomes the gateway to ensure access to library resources and services. According to Martin (2020), cloud computing is the best option for smart libraries in the digital environment to become sources of collaboration, to expound research, teaching, and learning opportunities. The aim of this final layer is to enhance discovery, to ensure that data and information transmitted via objects, and saved on networks become accessible to cater for individual user needs (Gul & Bano 2019).

Creating Smart Academic Libraries through the Internet of Things: Interactive Possibilities

Schöpfel (2018) proposes that smart academic libraries can be categorised as libraries that are well-performing in a forward way as information hubs that aim to provide access to information, so that individuals can explore and identify intelligent solutions to improve their academic and lifelong learning progression. Once libraries adopt IoT technologies and the interoperability of data exchange and service, the offering of alternative access to services and resources will improve (Jiang *et al.* 2019). This requires the realisation of full data exchange through an integrated combination of the four dimensions proposed by the conceptual relatives theory, namely smart technologies, smart people, smart services, and smart governance. As explained by Min (2014), the importance of these dimensions to expound the theoretical model offers a holistic approach to consider possibilities towards ensuring that

academic libraries offer opportunities to support teaching, learning, and research within vastly changing higher education environments.

Related to the first dimension of *smart technologies*, Gul and Bano (2019) explain that emerging technologies are a core component of a smart library. Technology tools should support web access, the personalisation of the library environment, smart searching in natural language (what users mean rather than what they say), and smart detection of knowledge through journal metrics and impact factors. Advanced technology founded on the premise of advanced internet functionalities, intelligent processing technology, cloud computing, and virtual universal technology linked to the IoT, form the foundation of converting libraries to smart academic libraries (Mohammadi 2019). As an example of achieving intelligence within the smart academic library, Yusuf, *et al.* (2019) propose the use of BluuBeam technology, which sends location-triggered information to mobile devices to assist users in searching for resources and expand their interests with contextual hints. The utilisation of BluuBeam technology offers vast opportunities for smart academic libraries to create structures where users can engage more actively with information resources. Linked to RFID interoperability, BluuBeam allows individuals and organisations to create, engage, and share new or existing content.

Similarly, social media can be used to further expand the engagement with smart library resources. Through platforms such as Facebook and Twitter, users can become creators of information, which is key within the context of the IoT, to expand the communication between objects and objects, objects and people, and people and people (Makori & Mauti 2016). Information available via existing social media can also be used to build and create connections with academic communities, by sharing information related to new resources and upcoming training endeavours.

In addition, innovative technologies can bring forth a vast array of new services. Mohammadi (2019) explains that innovative technologies can include the utilisation of a bookBot (robotic book delivery system) or virtual library simulation that assists the user to navigate virtually through the library via their mobile device. The use of AI technologies can expand opportunities related to user handling, networking, and communication (Gul & Bano 2019). As AI technology can think and act like a human without the manpower, AI tools such as robots can be used to offer virtual assistance to users, explore and connect content on behalf of users, and monitor the quality of material available in a smart academic library collection. Cao *et al.* (2017) refer, for example, to the library robot Map Treasure, which is used to inform readers of the precise shelf location of a book, updated in real time. Utilising AI for tasks such as accessing sources on behalf of users is not only cost effective in terms of time, but also spares human and material resources.

In instances where users visit library buildings, pressure pad sensors and wireless sensor networks can be used to obtain relevant information on the interests of users. Such information can be used to build a profile for each user. Pressure pad sensors are thin pad sensors enabled with Wi-Fi technology to record the movement of users in particular aisles (Mohammadi 2019). Linked to the pressure pads, wireless sensor network devices can track the movement of users through the library. Combining this information within the sensor network to obtain information on collection interests can provide much needed information towards collection development (Nag & Nikam 2016). Knowledge about the profile of individual users can, according to Makori (2017), also be used to supply users with instant update alerts on information products and services. Linked to IoT, smartphones can be used to provide users with instant alerts on new arrivals, the reservation of material, and the location of resources on shelves.

As the second dimension, *smart people* (information professionals and users) are required to ensure the effective utilisation of technology tools to execute and engage in smart library activities. As the development of smart libraries are reliant on people, well-trained, professional, and technologically savvy staff are at the core of smart library realisation (Cao *et al.* 2017). Similarly, users who can utilise technology optimally, are imperative to ensure that smart library services and resources are used towards promoting academic endeavours (Fernandez 2015).

In terms of smart library staff, Yusuf *et al.* (2019) explain that enhanced awareness and increased professional training in the technologies related to the IoT, are imperative to provide information professionals with the attributes required to offer enhanced services that cater for the needs of users within higher education institutions. Makori and Mauti (2016) elaborate that IoT technologies have transformed the role of information professionals, who are now required to be proficient in the use of technology tools such as website development, the use of educational games, simulations, video conferencing, the mobile exchange of information and webometrics, aimed at integrating information from the public web as part of the resources offered by academic libraries (Cao *et al.* 2017). Jadhav and Shenoy (2020) argue that smart information professionals must not only possess the skills to apply the IoT technology effectively, but also show insight and commitment to continually focus on technology advancements that may be needed to offer improved smart library services and access to resources.

Smart library users are needed to ensure that the library services and resources based on IoT technologies are fully used. Cao *et al.* (2017) state that library users can be divided into three categories: Novice users, urgent-need-of-information users, and senior users. Especially in the case of novice and

urgent-need-of-information users, extensive training is required to not only introduce library services and resources to these users, but also the extent to which technology can be used to assist them in engaging with smart library services and resources. For these users, bots can be made available to provide quick answers to frequently asked questions. Users can be trained through the use of animation games with further support offered through microblogging. Alagumalai and Natarajan (2020) emphasise the importance of library users to engage in information literacy and digital information literacy training. Through video displays, virtual library tours, social media engagements, video conferencing, and interactive library website information, basic and advanced information and digital literacy programmes can be offered to expand the knowledge and understanding of users on the use of smart library services (Makori 2017).

The third dimension relates to *smart services* that are highly personalised, computer-aided, and focused on knowledge sharing across media resources (Schöpfel 2018). Jadhav and Shenoy (2020) indicate that smart services are influenced by technological innovations aimed at building and exchanging smart library assets, as well as the offering of smart interoperable and interconnected library services. Alagumalai and Natarajan (2020) propose that academic libraries can utilise IoT technologies to offer a variety of smart library services. Gupta and Singh (2018), as well as Sheeja and Mathew (2019) suggest that smart services may include virtual tours and shelve guides from users' favourite lists and alerting services. Smart services relate to personalised services, library orientation and information literacy services, smart circulation control, and inventory control services.

Related to smart collection management and inventory control, RFID tags linked to enterprise resource management software, can be used to enable information professionals to assess the extent of a collection available to users (Gul & Bano 2019). The library collection processes and activities can be executed by notifying users of available new resources or resources that might link to their interests. The RFID tags can also be used to ensure the easy access of resources for inventory control. Android mobile readers can be used to read the RFID tags to offer a detailed list of resources available on library shelves. In this way the IoT can be used to improve the process of stock verification (Sheeja & Mathew 2019).

In terms of conducting searches for information linked to library resources and beyond (open web and resources available via other institutions), cloud-based access apps can be made available to users. Apps such as Deepknowledge, VitalSource, and the Bookshelf-mobile can be made available to users via the website of an academic library to promote remote-based access to information resources (Jadhav & Shenoy 2020). The use of such

apps is important to provide users with access to advanced inquiry systems, automated lists of literature selection, and anti-plagiarism services. To promote real-time access to information resources, smart academic libraries may also increase their access to electronic textbooks instead of printed copies. Textbooks are being procured through publishers such as McGraw Hill, Pearson, and VitalSource. Such electronic textbooks are accessed through the internet, using metadata to promote ease of identification and access, being ready to use anywhere and anytime (Cao *et al.* 2017).

As explained by Wójcik (2016), personalised services through the virtualisation of information resources can be offered with the help of the IoT. The virtualisation of information resources linked to interests and needs obtained about users via BluuBeam, can for example assist information professionals to rate preferred resources and to determine the best approach to promote and market underutilised resources. The IoT can be used to deliver contextual hints and information resources to support the extended use of varied information resources. The IoT can communicate detail about new additions in their area of interest to users and send them notifications about searches completed through catalogues. Data visualisation provides information on the use of information resources, which can be used as planning aids and decision-making on services and resources to offer to users (Makori 2017).

User information services can also be improved by using IoT technologies. Online help desks, where bots are used to supply generic information, can be created by using IoT technologies to solve users' queries remotely. For more advanced queries, AI tools can be used that are able to analyse and interpret the queries of users and to provide help through remote engagement (Sheeja & Mathew 2019). Similarly, virtual reference information services can be offered through platforms such as e-mails, instant messaging, and chat discussions. Makori (2017) refers to the Chatbot, which is a 24-hour virtual reference service that responds to users' queries without any human intervention. Users can ask questions in a web-based environment and the robot answers the questions in both voice and text. The use of data mining in libraries is of particular importance in the context of offering quality reference services (Gul & Bano 2019). Through data mining, large repositories of information are analysed, and potentially useful information discovered. Data mining is necessary because of the growing volumes of information and limitations of human analysis. Data mining therefore becomes an important service in providing individualised intelligent information, based on user needs within an academic context.

Smart circulation control can be achieved by utilising IoT technologies to alert users about their current holdings, overdue dates, and fines. Through

smart circulation control where android-based mobile readers are used, users can borrow, return, and renew library materials from anywhere and at any time. The android-based system provides each user with an authenticated ID and password to log into the system. This enables privacy and security, as only the user with the specific ID and password can access details related to their borrowing history (Sheeja & Mathew 2019). Self-check-in, self-check-out, overdue reminders, online fine payments, and minimising the misplacement of books can all be executed using IoT technologies. In addition, Gul and Bano (2019) propose that book delivery drones can be used in future to deliver information resources to users. Especially within the context of the Covid-19 pandemic, book delivery drones could be used to supply users with access to printed resources, where electronic versions are not available. Drone technology links mobile devices to users and their bibliographic information, to determine where books should be delivered. The value of book delivery drones is that they can be used to deliver books to disabled users who may not be able to visit a library building. In this way, varied technologies can be used to enhance the way in which smart libraries offer services and access to resources to users.

As the final dimension, *smart governance* relates to aspects such as utilising the IoT to create transparent library administrative systems, according to Jadhav and Shenoy (2020), by involving users in decision-making and focusing on increased social coherence. Schöpfel (2018) explains that smart governance includes components such as collaboration, cooperation, partnerships, engagement, and participation. At the heart of smart governance is the community and the use of technology to encourage active and engaged communities within the activities of smart academic libraries. IoT technologies are to be used to encourage user participation in decision-making, optimising administration procedures, real-time analysis of big data on library usage, and embeddedness of smart academic libraries in the social and cultural environment of the organisation with which it is associated. As explained by Okwu (2021), systems designed to facilitate collaboration, engagement, and improved access to information and service delivery, are imperative to support smart governance. Governance is a critical factor in any endeavour to introduce and expand academic library services through the application of the IoT. Key stakeholders must buy in on the endeavour to create smart academic libraries through IoT technologies, as these stakeholders have a high interest in the success of such endeavours. The emphasis of smart governance is therefore on collective intelligence, where shared responsibilities between staff, users, and other stakeholders promote transparency and accountability. Galve-Montore (2019) states that such shared responsibilities can be achieved through social media, automation of omnichannel marketing, screen experience evaluations, and the sharing of management dashboard platforms through library web

interfaces. Okwu (2021) adds that smart governance is necessary to provide better and faster academic library services through digital technology, embedded systems, AI, and the IoT. Thus, the governance of smart academic libraries is built around smart people, smart systems, and smart technologies to provide transparent and interactive academic library services.

Conclusion

Makori and Mauti (2016) emphasise the need for advanced information and technological infrastructures to support education and training needs within higher education institutions. To manage the digital environment, information professionals must obtain knowledge, skills, and competencies in electronic resource planning systems, social computing, business entrepreneurship practices, proactive marketing, collaboration and partnership, leadership skills, and digital literacy skills. Higher education institutions and university libraries need effective planning strategies for the implementation of IoT technologies, to promote smart academic libraries that render interactive and innovative services. As the centre of information sharing, the important role of smart academic libraries is to disseminate information and mediate the access to information. To facilitate this role, the IoT can support the facilitation of improved and innovative smart academic library services related to information access, information sharing, circulation, security, and self-serving. The IoT has unlimited potential for libraries, but it requires proper planning and effective implementation of technologies to bring true value to communities.

The information provided in this chapter aimed to clarify the architecture related to the IoT that should be considered when moving academic libraries from hybrid to digital to smart libraries. The chapter also provided a theoretical model as a foundation to explore possibilities wherein IoT technologies could be utilised to support the development and expansion of smart academic library services. It is now time for information professionals to further explore ways in which the IoT can be used to promote change, innovation, and advanced access to library services and resources. More research into the utilisation of new technology tools associated with the IoT is required, as well as ways in which the IoT can be applied to create smart academic libraries within the South African and African context. Research related to funding, training of smart people, and the utilisation of mobile technology to extend smart library services, is also required. To conclude:

> *The twenty-first century has demonstrated to be an era of digital revolution which has paved the way for smarter opportunities in the world including smart libraries. Now one can visualise libraries not as places, but as platforms that have redesigned the technologies, services and the humans adherent to them (Gul & Bano 2019).*

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On Achieving the Sustainable Development Goals through Coproduction of Knowledge

A Case Study of the Makers Valley Partnership

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Abstract

While the inner city of Johannesburg in South Africa exhibits a considerable decline and disarray, it is simultaneously a site attracting investment, infrastructural change, and growth. An enabling and democratic space for multistakeholder partnerships is therefore vital, particularly one that is inclusive, mutually benefitting, and reflecting local validity. Drawing on the Sustainable Development Goals (SDGs) as an analytical framework, the chapter explores the actions of a particular civil society organisation, the Makers Valley Partnership (MVP), that has established relations with several universities and entities to further sustainable development within Johannesburg's inner city. In these endeavours, a systematic, participatory approach to enhance the coproduction of knowledge is advocated. The latter could address uneven power dynamics as evident in previous ways of working and thus help to attain the SDGs. With respect to collaborations between civil society and public libraries, the key concern here is whether such alliances can be meaningfully built to achieve a common goal. It is argued that libraries can potentially play critical societal roles in the way they partner with civil society organisations, groupings, and movements. The chapter concludes with emerging lessons, recommendations, and policy implications.

Keywords: Coproduction of knowledge; libraries and civil society; Makers Valley Partnership (MVP); localising SDGs; Inner city Johannesburg

1 This chapter has been written largely by Inolofatseng Lekaba (80%) with helpful conceptual, theoretical, and literature inclusions from Trynos Gumbo (10%) and Kammila Naidoo (10%).

Introduction

The rate of urbanisation on the African continent is rising astronomically. As it stands, countries on the continent are attempting to address socio-economic and environmental imbalances caused by Africa's population dynamics (Ruhiiga 2013:48; Hunter-Adams, Makandwa, Matthews, Nyamnjoh, Oni, & Vearey 2018:12; Kundu, Sietchiping, & Kinyanjui 2020:5). Pressing problems include poverty, economic slump, housing shortages, food insecurity and environmental degradation (Castells-Quintana & Wenban-Smith 2019:1670). This represents the same socio-economic and ecological ills that inspired Agenda 2030 and is the basis on which the United Nations (UN) adopted the 17 Sustainable Development Goals (SDGs) with 169 targets and 232 indicators in 2015 (Rao 2016:2). Scholars have argued that the SDGs emerged from the Millennium Development Goals (MDGs) due to the UN's realisation that current developmental challenges have their origins in the increased rates of urbanisation (Sachs 2012:7). In 2016, UN-Habitat's New Urban Agenda was formulated in the context of the 2030 Agenda for Sustainable Development to reposition cities from sites of developmental challenges to those where solutions can be built (Caprotti, Cowley, Datta, Broto, Gao, Georgeson, Herrick, Odendaal, & Joss 2017:369). According to the UN (2017:3), there is a correlation between good urbanisation and development as expressed in the linkages between the principles of the New Urban Agenda and the SDGs, spotlighting Goal 11 on sustainable cities and communities.

It is because of this correlation that we are writing this chapter in which we focus on the developmental challenges experienced in the inner city of Johannesburg, and attempts by local partnerships to address it, using the 17 SDGs as a guiding framework. Here, we investigate the contextual nuances that underly these partnerships through a case study of the establishment and functioning of a grassroots civil society organisation, the Makers Valley Partnership.[2]

The chapter will first unpack the development scene of inner city Johannesburg. We will then give arguments for the localisation of SDGs while highlighting the MVP attempts in this endeavour. Third, we will zero-in on the nature of the partnerships between the MVP and universities. Finally, this chapter will propose a way forward for mutually beneficial partnerships between civil society organisations and university libraries that could ensure the realisation of Agenda 2030.

2 The research is based on a post-MA (REC 02-0035-2018) initiative. The key informant interviewees who are quoted, consented formally to their participation.

Framing the Local

In this section of the chapter, the overarching context of this study is explored. First, the focus is on the catalytic events that led to a ghettoised Johannesburg inner city, the resulting revitalisation programmes led by the local government, and private property development and its alignment to national (National Development Plan) and international development policies (SDGs). Second, this section will deconstruct arguments posed for the localisation of SDGs, given the context of Johannesburg's inner city and site for this study.

Johannesburg's Inner City

Historically, the Johannesburg inner city was a space through which wealth generated from the gold rush could materialise. The inner city, a buzzing hub of economic activity, began experiencing decline from the early 1950s. The initial catalytic event for this decline was the departure of the City Council to an outlying area, with the second catalyst being the change of parking regulations to restrict car usage (Guelke 2005:85). This saw businesses relocating and abandoning buildings. The third influencing factor was the ushering in of a democratic dispensation during which previously excluded racial groups began moving into abandoned buildings. This arguably triggered what is often themed as 'white flight' (Harrison, Gotz, Todes, & Wray 2014:15; Gotz & Simone 2003:130).

Mututa (2020:210) states that this series of catalytic events birthed a ghettoised Johannesburg inner city that is only a shadow of its golden era. However, so has the city's rapid urbanisation. Johannesburg has seen a population growth of 2.91% per annum from 2010 to 2020, which is double the rate of the rest of the country (Todes, Weakley, & Harrison 2018:284; Moyo 2020:160). Being the fastest growing city in South Africa, Johannesburg is grappling with various developmental challenges (Mbembe & Nuttall 2007:24; Practice Group 2018:1). While the city is a major contributor to the country's GDP, it has a poverty and inequality crisis with its economy ranked as one of the most unequal on a global scale (Madlalate 2017:474): 40% of those formally employed are described as unskilled or semi-skilled, underscoring that the city's skills base is discordant with its economic structure. There is also an unemployment rate of 32.7% while the youth unemployment is 40%+ (Stats SA 2011). In Johannesburg's inner city, as is in the rest of the metro, social exclusion and inadequate levels of human development translate socially as deprivation, substance abuse, gender-based violence, and crime, as well as spatially through housing shortages, low urban densities, large distances between places of employment, and residence and urban decay (City of Johannesburg 2020:40).

Despite these developmental hurdles, Johannesburg is at the centre of much reinvestment from the local government and private property developers (Reid 2005:158). The Johannesburg Development Agency, private developers through City Improvement Districts (CID), and other interested groups are implementing several inner city revitalisation plans and programmes at varying scales (Vejby 2015:89; Didier, Peyroux, & Morange 2012:920). While the site for this study is not a formal CID, the Victoria Yards urban revitalisation project is a joint venture to address developmental ills experienced on the eastern edge of inner-Johannesburg (Crewe-Brown 2018; Ho 2019).

Victoria Yards and other inner city revitalisation programmes are informed by the City of Johannesburg's Integrated Development Plan (IDP) (Zack 2015:63-65). The 2020/2021 IDP outlines goals and targets that mirror the SDGs, including employment creation, reducing socio-economic inequalities, and fostering a sustainable, inclusive, and resilient city (Amirtahmasebi, Orloff, Wahba, & Altman 2016). Local developmental policies such as the IDP and Johannesburg 2040 Growth and Development Strategy derive their direction from provincial and national policies (Kalina & Rogan 2017:10). South Africa, as a member state of the UN, develops its national development policies according to the frameworks provided by the UNDP as demonstrated by Fourie (2018:767) as well as Mthembu and Nhamo (2021:13). As such, there is a 74% correlation between Agenda 2030-SDGs and South Africa's NDP, Vision 2030 (Cloete 2018:4). In addition, owing to Goals 11 and 17 of the SDGs plus the New Urban Agenda, Johannesburg is strategically positioning itself as an enabling space for multistakeholder partnerships in the urban age.

Localising the SDGs

It is often argued that for the city of Johannesburg and other developmental organisations to create an enabling space for multistakeholder partnerships, there needs to be an increased sense of ownership, especially in terms of the SDGs (Dube & Nhamo 2021:2197). While it can be argued that in the Johannesburg policy context, SDGs have been incorporated into key frameworks like the IDP (Fourie 2018:767), such policy integration does not always translate to the localisation of the SDGs. This is because this process requires more than a mere local application of global level agendas (Tan, Siri, Gong, Ong, Lim, MacGillivray, & Marsden 2019:3). Hence, this section of the chapter deals with the advocacy for localisation of the SDGs, and the different approaches available for this, which are regarded as the most suitable for the MVP.

Research conducted on the MDGs as well as Agenda 2030-SDGs has yielded insights on the costs and benefits of using global indicators to further local development (Chirisa 2012:4). Klopp and Petretta (2017:64) observe

that certainly global indicators are valuable for comparing developmental challenges and progress across varying contexts. They, however, serve to demotivate action as do not reflect local values and may contribute to a sacrifice of local validity (Burford, Tamás, & Harder 2016:28 of 38).

For countries in the Global South, where there are pre-existing resource and capacity shortages, global indicators are rendered unusable. Localisation advocates assert that for global indicators to assume relevancy and applicability at local scales, data should be obtained that match local needs and values to these indicators (Reddy 2016:3). However, it is difficult for countries in the Global South to do, as these countries typically do not have resources to invest in data collection, or the capacity for this. Similarly, these resource and capacity shortages negatively impact the locally informed adaptations of SDG indicators (Patel, Greyling, Simon, Arfvidsson, Moodley, Primo, & Wright 2017:789). In this sense, there is a fragmentation of tasks and expertise on both vertical and horizontal axes. This may result in local actors who are experiencing frequent seclusions which rob them of much needed support and empowerment, further hampering possibilities for participation and ownership (Ruzickova, Yaremchuk, & Besgul n.d.:19).

As already mentioned, the call for the localisation of SDGs goes beyond a simple local application. This process requires a systematic approach which includes local agenda setting, decision-making, and monitoring, using locally adapted indicators (Lucci 2015). In this way, local actors generate a sense of ownership over the global indicators that is arguably vital for efficacious SDG implementation at local scales. Thus, the localisation of SDGs is procedure-oriented, aiming to build procedures that are responsive and relevant to local needs and aspirations (Tan *et al.* 2019:2 of 10).

Tan *et al.* (2019:3 of 10) argue that the most suitable procedure for the localisation of SDGs, especially in resource-poor countries of the Global South such as Malaysia, is Systems Thinking and Place Based Methods. Thus, the Systems Thinking and Place Based Methods for the Healthier Malaysian Cities (SCHEMA) project was initiated in 2014, using multistakeholder case studies. These place-based case studies focussed on the facilitation of an overt understanding of relationships and interconnections by encouraging actors and stakeholders to make use of system tools for model and narrative building (Sustainable Places Research Institute 2014:1). In the face of the vertical and horizontal fragmentation of tasks and expertise, such methodologies are argued to provide a common language as well as shared narratives about important development issues. Furthermore, this approach is pointedly suitable for the localisation of SDGs because context-sensitive development issues are better addressed through locally available resources such as human capital (Zinkernagel, Evans, & Neij 2018).

This is exemplified by the comments of the steering committee at the MVP. Below is the CEO's answer to a question posed on how their steering committee was started:

> *It started before I joined in 2018 and it flopped. When I joined I said, 'Let's bring it back' and we did. Thuso put a flyer out on WhatsApp, printed posters and put them on the different places that we know people engage in our community and people applied via WhatsApp to say, 'I'd like to be in' and we said, 'These are the different pillars: There's small business development; there's recreation; there's clean, green and safe; there's different pillars and if you are passionate about a specific pillar, then we'd like you to be a volunteer on the steering committee.'*
>
> *It has to be voluntary because we are the ones trying to create the committee but at the same time, we are not trying to influence the committee because the whole point is that they give us an objective point of view. We can assume and be on our high horses and have our meetings, but do we really have a real sense of what's happening? So, the steering committee was supposed to be people from our community but are not part of our organisation, who live and work in the community and have a passion and sense about their specific pillar…Their main role is to share what is needed for that specific pillar, like 'this is the status quo of recreation in our community; we think we need more activity at the park, we think we need more activity on the streets.' Whatever, so they would give us insights in terms of what is actually happening, where are the needs, where are we failing (CEO of MVP 2021).*

A defragmentation of expertise and tasks is evidenced in the steering committee working together with the MVP. In this context, experts that make up the Partnership are supported by community members in the form of the steering committee to examine a common goal and create new knowledge and theory (Tress, Tress, & Fry 2005:17). Surely, the fragmentation of expertise and tasks could be addressed using systems-thinking. However, in multistakeholder partnerships, another contextual difference needs to be considered, which is the context of power – hence, the discussion below.

Drawing in Theory

In this section, the theories that enhance this investigation into the MVP are engaged with. The most suitable framing theories are power and the

coproduction of knowledge – intended to orient the reader to intricacies of this case study.

The Nature of Partnerships in Multistakeholder Projects: The Context of Power

Literature that unpacks the nature of multistakeholder partnerships is presented here with a focus on the often-skewed power dynamics in participatory development. The essence of multistakeholder partnerships in development is to be a participatory platform for exercising voice and choice. Participation is preoccupied with developing a human, organisational, and management capacity to address challenges as they arise to sustain the improvements (Saxena 2011:6).

In multistakeholder participatory projects, expressions like 'empowerment' are habitually used, indicating an underlying context of power. Hence, we present arguments on the relations between power, rationality, and knowledge in such endeavours. This point of view is adopted because power and knowledge cannot be separated from each other. This observation was first expressed by Sir Francis Bacon (1597:20) in his pivotal quote, 'knowledge is power.' While this quote sufficiently expresses the fundamental nature of knowledge, it does little to fully extrapolate the nuances between power and knowledge.

Flyvbjerg (2003:18) argues that the relation between power and knowledge is one where the former can be exchanged for the latter and *vice versa*. Therefore, power *is* knowledge. Power exists where knowledge is abundant. Knowledge creates and maintains power. Therefore, an examination of the context of power in multistakeholder partnerships, especially those involving universities, that discounts or ignores knowledge, is one that is incomplete (Harkness 2005:1416). This is because the relation of power to knowledge is such that power determines what is judged as knowledge, presenting an interpretation of a phenomenon that is granted superiority over another. Additionally, power endeavours to acquire knowledge that can enhance its purpose and in the same breath, suppress knowledge that lies outside its mission (Short 2012:1819).

It is based on this argument that Flyvbjerg (2003:18) presents the case of the Aalborg Project to examine power, knowledge, and rationality, using ten propositions. In these propositions, it is increasingly clear that in democratic institutions, just as in social institutions, power dominates over rationality, even though democracy hinges on rationality to function well. Hence, in settings such as the Aalborg Project and others (Shabani 2003:93; Petzka 2007:17; Anderson 2019:197) where rationality has proved to be weak in the face of power, democracy built on this weak foundation risk's frailty. Seeing

that multistakeholder partnerships such as those examined in this study are anchored on democracy, this is concerning.

Monitoring Power in Multistakeholder Partnerships: Coproduction of Knowledge

It is with this layered understanding of the rationality of power that the concept of coproduction arose. Coproduction as a form of participatory theory and practice in knowledge production is regarded to effectively move towards creating longstanding shifts in democracy (Osborne, Radnor, & Nasi 2013:141; Weimer & De Ruijter 2017). It is a practical form of participation through which the liberty to define rationality (knowledge) and thus create reality is shared among the powerful administrative authorities and less powerful citizens (Pestoff, Bransen, & Verschuere 2013:4). Advocates for coproduction argue that this shared freedom to create reality can more effectively balance out the imbalanced power relations that exist in this system, as demonstrated by Polk and Kain (2015:18) as well as Durose and Richardson (2016:13).

While the concept of the coproduction of knowledge has gained significant popularity due to its compatibility with democratic principles, it has multiple and varied definitions. Varied as these definitions are, they link the coproduction of knowledge to an evolving band of participatory and cross-disciplinary research methodologies (Nature 2018). For sustainability research, coproduction of knowledge is lauded as potentially producing a greater impact on sustainable development outcomes (Balvanera, Daw, Gardner, Martín-López, Norström, Speranza, Spierenburg, Bennett, Farfan, Hamann, Kittinger, Luthe, Maass, Peterson, & Perez-Verdin 2017). Hence, for this research, on achieving the UN SDGs through the coproduction of knowledge in the inner city of Johannesburg, this concept is understood in terms of 'Iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future' (Norström, Cvitanovic, Löf, West, Wyborn, Balvanera, Bednarek, Bennett, Biggs, De Bremond, Campbell, Canadell, Carpenter, Folke, Fulton, Gaffney, Gelcich, Jouffray, Leach, Le Tissier, Martín-López, Louder, Loutre, Meadow, Nagendra, Payne, Peterson, Reyers, Scholes, Speranza, Spierenburg, Stafford-Smith, Tengö, Van der Hel, Van Putten, & Österblom 2020:183). With the emphasis on 'iterative context-based processes,' this definition encompasses the arguments made by Tan *et al.* (2019:4 of 10) that Systems Thinking and Place-Based Methods are the most suitable for the localisation of SDGs in resource-poor countries of the Global South. Therefore, this study understands the coproduction of knowledge as a procedure through which knowledge is produced alongside capacity development, the building of social networks and capital, and an implementation of activities that

contribute to sustainability while monitoring power (Jasanoff 2004:5; Miller & Wyborn 2018:90).

Goldman et al. (2018:6) argue that despite these noble ideals of the practice, coproduction of knowledge often works as a veil to power differentials, thus necessitating a further development of nuanced analytical tools for examining power dynamics in social institutions. One such tool is introduced by Montana (2019:1582) that examines power dynamics in decision making institutions by dissecting multiple organisational dimensions as it pertains to coproduction. Using the case of an international sustainability programme, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) applies this analytical tool to examine the power relations between participants, processes, and products.

In the examination of this case, Montana (2019:1584) presents his overarching argument through the lens of coproductive forums, socially constructed spaces in the organisation that are posed in time and space to facilitate structures and oftentimes continually negotiate interactions between the participants, processes, and products. More typical, these forums can be workshops or collective meetings. They can, however, also take the shape of less controlled exchanges like e-mail correspondence or lunch meetings. In this case study, participants are researchers, stakeholders, or policy makers. The process could take the form of a workshop where the products commonly lean towards being of a scientific nature such as reports or articles, or in other instances, social networks, collective schemas, and other such softer products (Miller & Wyborn 2018:92). These forums, regardless of their nature, operate within frameworks of participation, representation, and deliberation, with their outcomes conveyed through a series of activities, guided by a framework of circulation. Frameworks of participation determine the involvement of some individuals over others (Brandsen, Verschuere, & Steen 2018:5). In the frameworks of representation, individuals are selected from designated population groups or communities as representatives of whatever worldview (Lindquist 2013). Frameworks of deliberation are more prescriptive of how the interactions between these individuals will take place, detailing the decision-making process (Kallis, Videira, & Antunes 2007:24), while the frameworks of circulation are centred on building and providing for a practical logical lens for designing and assessing coproduction initiatives (Durose & Richardson 2016:14).

Coproduction as occurring through these frameworks and its concepts can be idealised as the axiom of democratic progress (Lidskog & Elander 2007:76) and as a noble endeavour for empowering citizens and other groups that do not traditionally share in the decision-making process of social institutions. Despite this seemingly supportive environment for coproduction,

these frameworks and concepts of participation, representation, deliberation, and circulation are occurring within organisational dynamics that might not always be aligned to its principles.

Indeed, Pestoff (2018) argues that the complexities of the organisation can either enhance the democratic process of coproduction or diminish its effectiveness in monitoring power. It is observed that organisational dynamics in the IPBES case proved to be quite rigid to the ideals of the coproductive initiatives (Montana 2019). Participants found that despite all others, the organisational framework based on individual value systems affected their liberty to exercise the power vested in them by this 'inclusive' form of participation. Montana (2019), Pestoff (2006:15; 2018), and Vamstad (2007:229) conclude that, to remedy this challenge, designers of coproduction initiatives are to be more aware of the impact of cultural variances in organisational frameworks.

In this case and those presented by Jasanoff (2004:10) as well as Rausch and Krige (2012:9), coproduction is not an inclusion-centred form of participation presented to ensure a joint production of knowledge and rationality, it is rather a process of learning and incorporating different ways of organising social (power) relations. The organisational dimensions (participation, representation, and deliberation) offer a varied analytical tool for interrogating power dynamics in a democracy, contrasting the power and rationality tool offered by Flyvbjerg (2003:320). With both tools, power relations in a democracy can be interrogated organisationally and systemically. Using the organisational dimensions tool, the micro power relations between participants, processes, and products in social and democratic institutions are illuminated, and with the systemic lens, there is an opportunity to examine the social structure of power and rationality in these institutions.

In an effort to ground these theoretical understandings, the coproduction of knowledge in achieving the SDGs at the MVP will be assessed, using four general principles as espoused by Norström *et al*. (2020:187). These principles are chosen because they emphasise the context-specificity and process-based nature of this approach (Balvanera *et al*. 2017; Patel *et al*. 2017:790). Hence, the four principles for the exceptional coproduction of knowledge for sustainability are 1) context-based; 2) pluralistic; 3) goal-oriented; and 4) interactive.

Methodological Approach: Gathering Data

In this section of the chapter, data on the establishment and functioning of the Makers Valley Partnership are presented. The data are drawn from a preliminary study that began in May 2021, conducted by one of the authors. To synthetise this section, four data collection tools are described. The first is a document review through which publicly available reports were assessed.

The main author also requested documents from the CEO and community manager that could elucidate the day-to-day functioning of the organisation (Nishigaki, Nitta, & Onoda 2018:47). The second data collection tool was unstructured interviews with the CEO and community manager of the MVP and the chairperson of its board (Roulston & Choi 2018:234). In an effort to add another layer to this data collection process, participatory and non-participatory observations of the MVP were conducted at their studio in Victoria Yards (Lavia, Witchel, Aletta, Steffens, Fiebig, Kang, Howes, & Healey 2017). This took place in the period between April and August 2021, during which the fourth data collection tool was employed, which is naturally occurring conversations (Kyprianou, Graebner, & Rindova 2015:274) between the first author and the CEO, chairman of the board of the MVP, community manager, studio manager, and project coordinator of the MVP, and founders of local civil society organisations. The data from the document review, unstructured interviews, observations, and conversations were then analysed using a bottom-up approach to thematic analysis (Maguire & Delahunt 2017:3353). This was all done under the theoretical umbrella of a contextualist qualitative methodology (Bachmann 2020:81).

Case Study: The Makers Valley Partnership(s)

The MVP, a non-profit company that uses action research (Cohen, Manion, & Morrison 2017:303) in its work with social and creative enterprises in Johannesburg's inner city, originates from two knowledge production exercises. The first was the PhD project of its cofounder, spanning from 2017 to 2020. The second was the Makers Way placemaking project between the Johannesburg Inner City Partnership and the local community. In this section of the chapter, we will unpack the emergence of the MVP through these two projects, specifically the Makers Way project, and present experiences from its decision-making partners, the CEO and community-manager, in its day-to-day operations. This analysis is done, using the overarching theory of coproduction of knowledge. To begin with, the context of power in the MVP is examined, followed by the organisation's use of tools to monitor this power context.

The Context of Power between the Makers Valley Partnership and University Libraries in Achieving the SDGs

With the establishment of the MVP, originating from the PhD research of its cofounder, it is not surprising that the civil society organisation values working with institutions of higher education. Certainly, the MVP has worked with several universities to further the sustainable development of eastern inner Johannesburg. However, these collaborations have not yielded mutually

beneficial exchanges. Lending evidence to the arguments made about power, rationality, and knowledge in such arrangements (Ozdemir 2021:354).

In conversations with the organisation's cofounder, who has his roots in academia, it was revealed that universities are benefiting from their engagement with the MVP. He reported that researchers and students who approach them can test their inventions in a 'real' life context or simply study the organisation, produce research reports, publish articles, and grow intellectually and professionally, while leaving the community unchanged (Hutchings 2021:54). In this power context, researchers who are backed by powerful institutions like universities, dictate the knowledge which is produced, use rationality to define reality, and further enhance their position (Short 2012:1877).

With this understanding of the skewed power dynamics between the MVP and universities, a question was posed to the interviewees to gauge if they envisioned a mutually beneficial partnership between their organisation – by extension the community – and university libraries. The cofounder clearly stated that he does not know how this would work, given the imbalances of past collaborations with universities. He reported that apart from enhancing the community's access to information, he does not envision any other type of partnership with an academic library. The CEO argued that it would be ideal for universities (not necessarily libraries) to make research funding available to the MVP so that they could conduct their own investigations on the community needs and the effectiveness of their projects and programmes. While research funding has not materialised for the MVP, they are writing and submitting funding proposals to international donors with the help of a social impact researcher from the United Kingdom. This endeavour, as well as its rationale are aligned with the arguments made for the localisation of SDGs in countries of the Global South with limited resources and capacity for research (Zinkernagel *et al.* 2018:7 of 17).

Design and System-Thinking as a Tool for Coproduction of Knowledge

The Makers Way project, an initiative of the MVP, followed an experimentational approach to placemaking for purposes of exploring, linking, and sharing ideas, skills, and knowledge. The method used for this was design thinking, which is argued by the cofounder and in the Makers Way project plan, to have proven most desirable for two reasons: First, it was revealed that through design thinking, community buy-in could be cultivated. Second and most relevant to this research, design thinking was identified by the Makers Way project implementation team as having the ability to ensure that the societal hierarchies and inequalities that are pervasive in the local context of power can be levelled out (MVP 2018:37). In this regard, design thinking was adopted as a

tool for monitoring power dynamics in the project, a tenet that is inexplicitly attuned to Goal 10 of the SDGs-reduced inequalities.

This method of design thinking as understood universally and applied in the Makers Way project is akin to a knowledge coproduction exercise. It also mirrors systems approach principles that are espoused for localising SDGs including the local agenda setting and decision-making. This method typically follows six stages to produce the desired outcomes, products, and learnings. The first is called 'empathise,' where members of the community share their lived experiences with development experts in order to ensure that those affected by the problem are centred (Elsbach & Stigliani 2018:2301). The second stage involves the analysis of data collected by experts from the community's lived experiences. In this stage, the core of the developmental problem is 'defined,' using both expert and conventional knowledge. In the third stage of the design thinking method, all stakeholders 'brainstorm' possible solutions to the clearly defined and understood problem, suggesting 'inventions' that will be made with transient materials in stage four of prototyping. In the fifth stage, the inventions and solutions are 'tested,' the results of which are 'shared' among all in the sixth and final stage (Mahmoud-Jouini, Midler, & Silberzahn 2016:148).

In attempts to safeguard the effectiveness of this process, community members, local organisations, and experts were allowed to group themselves according to an area of interest or one in which they were already active. The three interest areas for the Makers Way project were 'safe and clean,' relating to SDGs 6 and 13, 'productive,' that spoke to SDG 9, and 'inclusive,' which facilitated projects addressing SGDs 4, 5, 10, 16, and 17 (MVP 2018:3). Certainly, it was not difficult for the project managers and facilitators to garner participation on these three areas of interest because residents of the Valley are passionate about their neighbourhood, enough to want to be instrumental in its betterment. However, other unforeseen challenges were encountered and centred on the method of design thinking (MVP 2018:34). According to the Makers Way phase 1 report, community stakeholders did not grasp this method of project implementation until a workshop was held. In this workshop, facilitated by Play Africa (a non-profit organisation that uses play to teach children and adults), stakeholders practically engaged in the six stages of design thinking. While this assisted to conscientise them on process-driven projects, it was decided that for the subsequent phases of the Makers Way, they would focus on mostly working with organisations and individuals who already use the design thinking method in their own projects (MVP 2018:44).

The Makers Way project, even though it sought to address key areas of development through 16 placemaking activations, did not set out to establish

permanent solutions to the explored challenges. Rather, through design thinking, this project created a space for experimentation and mutual learning where experts, local organisations, and especially members of the community would develop their skills and build self-worth through testing out their ideas and seeing them materialise (MVP 2018:44). Thus, the founding project of the MVP paved the way for the civil society organisation to adopt a working culture aligned to the argument of Tan *et al*. (2019:8 of 10) for localising SDGs, which advocates for procedures that are responsive and relevant to local needs and aspirations. In the Makers Way of 2018, this procedure was the design thinking approach with multiple stakeholders.

In 2019, when the MVP was formally established as a non-profit company for the sustainable, inclusive development of the eastern edge of inner Johannesburg, the civil society organisation inherited the following feature from the Makers Way project: its aim was to continue creating a space for experimentation, learning, and skills' sharing among all its stakeholders (MVP 2018:44). While no longer explicitly applying design thinking for their projects, the community manager informed the main author that the MVP attracted knowledge producers in the form of researchers and inventors from other civil society organisations and universities. The community manager elaborates on this below:

> *For instance, a lecturer at Wits wants to test out a product with Engineers Without Borders at the community…We started learning to use the community as a space to brainstorm ideas and solutions to whatever challenges that are present. Community-engagement sessions are used to merge different knowledge systems by allowing experts to come in to share how they could benefit the community but also let community members share their experiences with experts to create a project that benefits and solves local issues. This is always the case: Researchers and experts approach Makers Valley Partnership with ideas that they want to pilot and Makers Valley Partnership acts as a bridge to reach the community (Community Manager of Makers Valley Partnership 2021).*

Through projects such as the Food Hub and Swap Shop which are both focused on reducing food insecurity in the community and thus speak to Goal 2 of Zero Hunger, the MVP had to adopt a heuristic implementation approach. These projects specifically arose from the crisis of Covid-19 in 2020 where community members lost their jobs and could no longer afford to feed themselves and their children. The MVP had to respond quickly to this challenge which saw several hiccups arise months later, such as the theft of food and kitchen supplies. However, the MVP and its partners in these projects were afforded multiple

opportunities to learn from this and create a food security programme that is responsive to local needs and conditions. Currently, this programme has birthed a new social enterprise in the area, contributing to zero hunger, decent work, and economic growth (SDGs 2 and 8).

In these examples, we observe how the legacy of the design thinking approach, used in the Makers Way project permeates the day-to-day functioning of the civil society organisation. Here, the six stages of the method are loosely followed and there is a culture of coproduction of knowledge that is embodied by the MVP.

This tenet is also witnessed through the organogram of this civil society organisation. As its name suggests, the organisation is not an individualised entity, but rather an amalgamation of creative and social enterprises that are working towards a similar goal of inclusive, sustainable development on the eastern edge of Johannesburg's inner city. According to the CEO, there are numerous partners that the MVP works with to ensure that various developmental challenges in the community are addressed. Partners include the Love Our City Klean, which is a local social enterprise that works on waste management; Safe Study and Timbuktu in the Valley are both non-profit entities that focus on early childhood development and basic education; 94 Colours works with reducing inequalities; Engineers Without Borders (EWB); the University of the Witwatersrand; and the University of Johannesburg's Process, Energy and Environmental Technology Station (UJ PEETS). Some of these partners are located within the affected community. However, the CEO alluded to the fact that there is a significant number of their partners that are not based inside the community such as EWB, the University of the Witwatersrand, UJ PEETS, and the American Embassy, who nonetheless provide important capacity and resource development for the MVP.

In one of their research funding proposals to the Ford Foundation, the MVP articulated how this research project will follow a coproduction of knowledge methodology (MVP 2021). This would be done through inviting community members to form a part of the research team where they will be trained as community scientists. The insights from the research would then be used for a public exhibition and a framework of their operation will be developed and exported to other civil society groupings around the country. This plan is in tandem with the principles for the coproduction of knowledge in sustainability research as espoused by Norström *et al.* (2020:183). While their operational model is not characterised along these theoretical lines, our examination thereof revealed that they are already engaged with these principles.

First, their processes are context-based, only focusing on the five neighbourhoods of Bertrams, Troyville, New Doornfontein, Judith's Paarl,

and Lorentzville, as well as the developmental challenges thereof. Second, they explicitly recognise multiple ways of knowing and doing as are obvious in the numerous workshops held with people from diverse backgrounds (Nature 2018). For instance, their workshop for establishing a 'Theory of Change' involved individuals from higher education institutions, community members, and themselves as an organisation. Third, MVP is goal oriented in their knowledge production (Van der Hel 2016:169). In conversations with their CEO and community manager, it was noted that even though they insist on flexibility in their targets, they do this within the confines of their broad goal of creating an enabling environment for social and creative enterprises in the Valley. Lastly, this environment is one that is highly interactive (Pohl & Hardon 2017:232). The MVP engages in multiple projects that involve continuous experimentation and learning, such as the Food Hub. They periodically hold community conversations, have a community-driven steering committee, a community WhatsApp group, the CEO sits on multiple City of Johannesburg development forums, and through their studio at Victoria Yards, they directly interact with different members of the community they serve.

Coproduction of Knowledge between the Makers Valley Partnership and University Libraries: Possible Pathways

Could this approach be used for collaboration between the MVP and university libraries and possibly level out the uneven power dynamics witnessed in the past, and in this way achieve the SDGs? While the answer to this question is yet to emerge from this study, this segment of the chapter aims to examine instances where civil society and public libraries have formed alliances to achieve a common goal. It is from these examples that a collaboration between the MVP and university libraries could be envisioned.

It goes without question that libraries are crucial for supporting literate, informed, and participatory communities (Weinberg & Flinders 2018). In their support for active citizenship, libraries are bolstered by energetic and dynamic individuals (Findlay-King, Nichols, Forbes, & Macfadyen 2018:165). Hence, the relation between society and dynamic libraries is ideally symbiotic. On this basis, libraries can play an imperative role in the overall society by partnering with civil society organisations, groupings, and movements. While these partnerships could yield much public good, their nature is typically ambiguous. This ambiguity is a result of the open-ended nature of the functions of libraries in different contexts (Library Policy and Advocacy 2017).

Nonetheless, there are instances where such partnerships have been formed to the mutual benefit of all stakeholders. In the first example, the Hungarian School Librarians Association joined a coalition of non-governmental organisations which was opposing a legislation that sought to fundamentally centralise the public education system. Even though

the movement was made up of groupings representing students, parents, teachers, and other interest groups, it still found a single voice where it was understood that a strong school library strengthens democratic schools and *vice versa* (Domsody, Pataki, & Veronika 2017:6). The second example takes us to Columbia in Latin America, where the Fundación Connector invigorated the national library sector through organising, expanding new tools, aiding libraries present at events and respond to consultations. This was all done to realise one goal: To heighten the government's engagement in copyright reforms of 2011 (Ramirez-Ordonez & Ramirez-Ordonez 2017:3). Therefore, since this movement, libraries are now recognised as key stakeholders in debates that centre access to information (Fundación Conector 2015). In the last case, the City Library of Newcastle invited an NGO (Open Rights Group) working on digital privacy to host a crypto party at their premises. Through this, the City Library formed an alliance with civil society for purposes of ensuring intellectual freedom while also enticing unique expertise (IFLA 2017).

Policy Implications

While this chapter is written from a preliminary and ongoing research endeavour, there are emerging lessons, recommendations, and policy implications. Hence, this brief treatment. Indeed, for settings such as the Johannesburg inner city where resources and capacity are limited, multistakeholder partnerships are ideal for the efficient realisation of SDGs, more so in localisation efforts. However, a key lesson that arose from this case study is that such partnerships are oftentimes ladened with skewed power relations. These imbalances are produced and reproduced, using knowledge and rationality, demonstrated in the relations between the MVP and universities as well as affiliated individuals. As a recommendation for equitable multistakeholder partnerships in this context, a dualistic application of coproduction of knowledge should be adopted. Here, the principles for knowledge coproduction as presented by Norström *et al.* (2020:183) would be used for learning and incorporating different ways of organising social power at both organisational and systematic levels. At an organisational scale, the micro power relations between participants, processes, and products in social institutions (civil society and university libraries) are illuminated through knowledge coproduction, while systematically, the method offers an opportunity to examine the social structure of power and rationality. Although this is not the approach used in the Hungarian and Columbian examples, it can still be argued that for a sustainable Johannesburg inner city, the approach to coproduction of knowledge between the MVP, universities, and academic libraries, is the best policy directive.

Conclusion

Against the backdrop of a Johannesburg inner city that has been experiencing a decline since the 1950s, but also reinvestment and revitalisations with the dawn of democracy, this chapter sought to investigate the partnership possibilities between civil society organisations and universities for achieving the SDGs. This was done with a case study of the MVP. First, the chapter outlined that despite an alignment between the development policies of South Africa (by extension, Johannesburg) and the UN's Agenda 2030, the localisation of SDGs requires a procedural shift that would ensure a sense of ownership for local actors. With the emphasis on multistakeholder partnerships as a vehicle through which this could be achieved, the context of power that is often under-investigated, was described. Through this, the imbalanced power dynamics in multistakeholder partnerships were highlighted through unpacking the relation between power, knowledge, and rationality. The coproduction of knowledge was positioned as an antidote to the rationality of power detected in these partnerships. This theoretical basis was then applied to the establishment and operational models of the MVP, revealing that this grassroots civil society organisation in Johannesburg's inner city understood the value of knowledge-based development action and has centred knowledge coproduction in its projects.

However, while the organisation has partnered with universities in a select number of their projects, these partnerships have evidenced that the rationality of power indeed triumphs over the power of rationality in this context. Therefore, while the MVP still welcomes university engagement in its various SDG focused projects, it was revealed that it does not necessarily envision a mutually beneficial relation with these institutions, and this currently includes academic libraries. Hence, we sought out international examples that elucidate partnerships between civil society and academic or public libraries for the attainment of a common goal. It is with this understanding and optimism that policy recommendations have been made. Through these models, the MVP can begin to imagine future collaboration with academic libraries and institutions that would yield significant progress towards achieving the SDGs in their locale.

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The Role of the Library in Actualising United Nation Sustainable Development Goals in South Africa

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Abstract

This chapter critically reflects on the potential roles of South African libraries in facilitating the actualisation of the Sustainable Development Goals (SDGs) of the United Nations (UN). The implemented UN 2030 Agenda is all-encompassing, facilitating financial, environmental, and communal growth. The attainment of these SDGs will be via an inclusive agenda, leaving no-one behind. Libraries are major institutions that could assist universities to achieve the SDGs by playing a critical role in research and education. The society that is privileged to have unlimited, but controlled access to information will do well in eliminating inequity, in developing sustainable strategies for food security, in adopting quality inclusive education, and in supporting public health. In addition, the society will place more value on research and innovations. To achieve the purpose of this study, a critical review of literature was conducted. Therefore, this chapter highlights some expectations of librarians during this era of knowledge economy. It also highlights possible challenges that libraries could be facing in meeting such expectations due to the unprecedented Covid-19 pandemic. Furthermore, this chapter emphasises the significance of the government's partnerships and national support to realise the inclusion of access to information, and individual access to information and communication technology in the UN 2030 Agenda. Additionally, suggestions on how the government can support libraries in meeting its expectations towards attaining the SDGs, are recommended. Conclusively, effective partnerships have become a crucial part of library management in the attainment of the SDGs.

Keywords: Challenges; library; Sustainable Development Goals; access to information; Covid-19 pandemic

Introduction

In 2015, the entire globe embraced a set of goals to put an end to poverty, to safeguard the earth, and to ensure prosperity. 17 goals that could stimulate sustainable development were put forward and approved. Each goal has a target of achievement over 15 years (Bárcena, Cimoli, García-Buchaca, Yáñez, & Pérez 2018:5). The commitment of the private sectors, the government, civil society, and individuals is required to ensure the attainment of these adopted goals. For the development of any nation, there is a need for the provision of appropriate, rationalised, and sufficient information on education, food, health, security, gender equality, democracy, etc. Therefore, libraries can make provision for such access to information that would facilitate a productive living of people. Nevertheless, it is essential for people to be experienced at recognising, attaining, consolidating, offering for use, and openly preserving materials regardless of the form in which it is packaged so that it is accessible when needed (Ukubeyinje & Ejitagha 2019:270).

There are 17 Sustainable Development Goals (SDGs) that target the eradication of poverty and food shortage and make provision for good health, gender inequality, decent jobs, good education, economic development, and partnerships amid global communities. These SDGs are illustrated in Figure 1. The world's severest challenges are responded to by these goals. The purpose of the SDGs is to advance people's lives by expanding their choices, free will, and self-esteem (Mojapelo 2018:1). The SDGs of the United Nations (UN) identify the interdependence between development, poverty elimination, and sustainable growth so that realising one of them can be anticipated to contribute to accomplishing others. For instance, the eradication of poverty would definitely assist in dealing with wellbeing and education challenges. Likewise, attaining the health and education goals would also play a vital role in combatting poverty.

Figure 1: The 17 SDGs (Porfiris, 2020).

A concerted effort is required from the government and other role players in order to achieve the SDGs. This is to ascertain that the goals are attained through coordinated, focussed, and sustained approaches.

The library is a key agent of transformation, capable of promoting development and social transformation through the provision of valuable library and information services such as the provision of easy access to information, the preservation of information sources, storage facilitation and information retrieval, as well as literacy advocacy. The library services could enhance the actualisation of the SDGs. Against this background, the purpose of this chapter is to facilitate a discourse around the roles of libraries in facilitating the actualisation of the SDGs by supporting the universities and the government initiatives tailored at achieving the SDGs. This chapter therefore critically outlines and redirects its readers on the potential role of libraries in supporting the SDGs, and invigorate the expectations of librarians during this period of knowledge acquisition. It is anticipated that librarians would make public access to information easier, preserve information sources, facilitate storage, and retrieve information, as well as advocate literacy. It also highlights challenges which libraries could be facing in meeting such expectations as a result of the unprecedented Covid-19 pandemic, while possible solutions are proffered.

This chapter also redirects the major importance of government's partnerships and national support to realise the inclusion of access to information, public access to information and communication technology (ICT) and the cultural heritage in the UN 2030 Agenda. Lastly, future viewpoints on how governments can provide support to libraries in attaining the 17 SDGs are suggested. As such, the SDGs can be used by university libraries as a benchmarking tool/mechanism as well as challenging established flexible objectives associated with the UN 2030 Agenda.

South Africa and the Sustainable Development Goals

Sustainable development is the growth that meets the desire of the current generations without conceding the capability of upcoming generations to meet their own needs (Sustainable Development Commission 2011). Sustainable development that is applicable and fitting to the South African framework will involve communal and accelerated advancement. It will also involve directed interventions and public deployment to eliminate scarcity, and ascertain the sustainable utilisation of our natural resources and ecosystem facilities.

In South Africa, sustainable development concepts have been incorporated into the law. The National Environmental Management Act No. 107 of 1998 defines sustainable development as the incorporation of social, economic, and environmental factors into the planning, implementation,

and decision-making for current and upcoming generations (National Environmental Management Act No. 107 of 1998:7). Hence, the primitive perception of sustainable development is dependent on two major points, namely fairness within generations and between generations, and upholding the integrity of natural, financial, and human capital to ensure that economic and social growth are resolved with the environmental safety (UNDP 2003). Figure 2 illustrates a systematic approach to sustainability based on the fact that the ecosystem, socio-political system, and the economic system are entrenched within each other, and then united through the governance system that embraces all the other systems together within a valid monitoring framework.

Sustainability is explained by the compatible combination of these systems over a period of time. It also implies ensuring that these systems remain mutually compatible, as the key development challenges are accomplished through particular actions and interventions to eliminate lack and severe disparities (DEA 2014:73). This is better than the widely used image of the three isolated intersecting circles which describe sustainable development as restricted to a crumbly space where all three circles meet (DEA 2014:73).

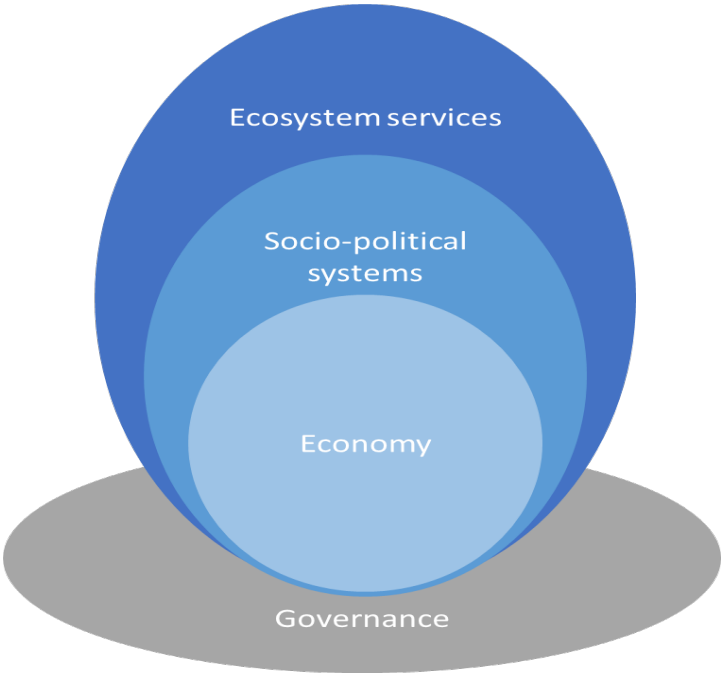

Figure 2: System economic, socio-political and ecosystem approaches to sustainability (personal archive; adapted and modified from DEA 2014:73).

The realisation of the process of a national framework for sustainable development is highly dependent on the stakeholders' involvement. The review process has been complicated and monotonous, like the policy that it apprises (DEA 2014:191). Involvement is ensued via a variety of approaches, such as interviews, well-thought-out multistakeholder workshops, publicity campaigns, facilitated focus groups, professional research-based ideas, written submissions, and academic panel reviews (DEA 2014:191). Feedbacks are received from government organisations, industry, workforce, research societies, professional bodies, and the public, desiring to contribute to development. Figure 3 illustrates the methodology involved in generating a national framework for sustainable development.

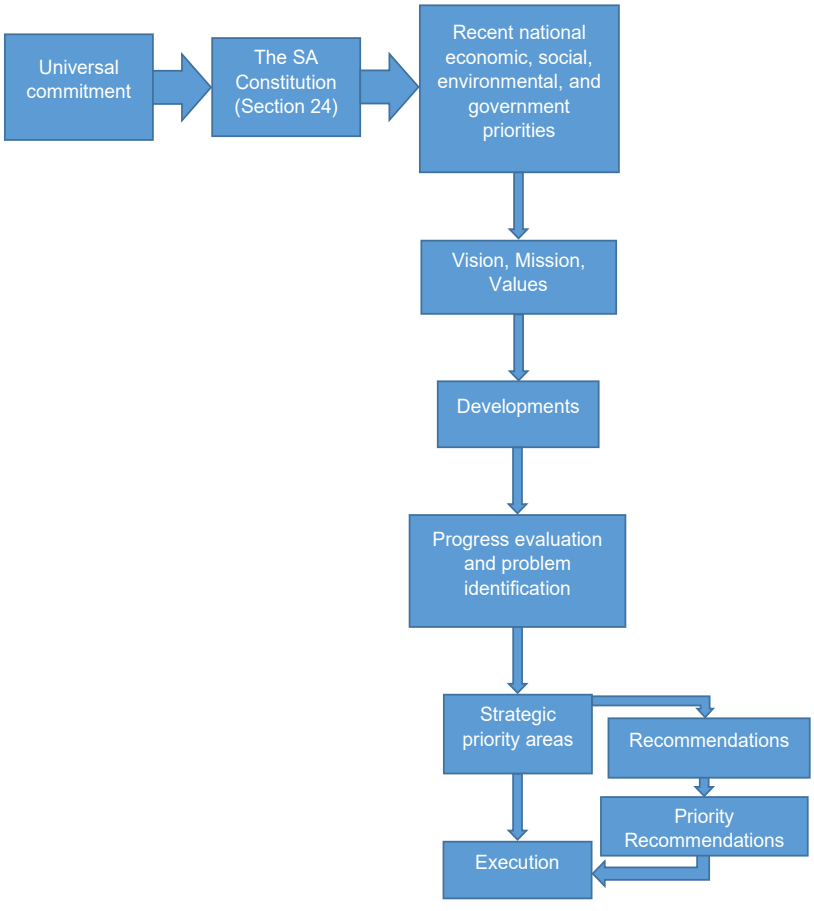

Figure 3: Flow diagram of methodology for developing a national framework for sustainable development (personal archive; adapted and modified from DEA 2014:31).

Libraries in South Africa and Attainment of Sustainable Development Goals Through Campaigns

South African libraries are involved in the development of South African communities through its programmes. It is partly responsible for promoting growth in numerous areas by offering services and significant information in support of the SDGs. The goals, targets within these goals, and the role played by the libraries in each one of them are discussed in the following subsections.

Poverty Alleviation (Goal 1)

According to Fengu (2017), South Africa had a dual education system and labour market during apartheid, as a result of the educational system. Currently, the bilateral educational system still confines social flexibility and perpetuates labour market inequality as well as the 'cycle of desperation.' Dornan and Regan (2012:1) assert that inequality causes the transmission of poverty from one generation to another: 'It is so unfortunate that the poverty of a mother can negatively affect the bright future of her children' (Mojapelo 2018:11). Prevalent poverty is one of the major challenges facing South Africa, which is worsened by high levels of unemployment and illiteracy, as well as a lack of education. In the first quarter of 2021, the official unemployment rate was 32.6%. In the last five years, there has been no significant development to better it – to the contrary, the rate has worsened (Stats SA 2021:1).

The Covid-19 lockdown in 2020 has also contributed to the high rate of unemployment in South Africa. Therefore, in order to assist the government in eradicating the plague of poverty, young entrepreneurs are encouraged by the South African libraries to create their own businesses to become employers of labour instead of employees of labour (Maepa & Marumo 2016:4). The use the public library system, free internet, e-mail facilities, and library spaces can immensely help the potential entrepreneurs to develop their businesses. Many young entrepreneurs use library facilities to run their businesses, and communicate with customers by e-mail. In addition, government tenders are checked, orders are processed, and customers' enquiries are responded to, using internet facilities in the libraries. If not for the assistance rendered by the libraries, many of the new businesses run by young entrepreneurs would not have survived, due to the high cost of renting offices and internet usage in the proper business sector. Attainment of the SDGs in Africa is being monitored by the Africa Progress Panel, and this panel is optimistic that Africa can completely eradicate poverty and embark upon a life-changing human development route. However, African leaders need to bring the underprivileged and the most relegated sections of society from the periphery to the centre of policy design (Mbaku 2020).

Ensure Healthy Living and Promote Wellbeing for Everybody (Goal 3)

The South African libraries assist helpless women to access information on health-care, pregnancy, and childbirth, and to teach women to know how to take care of their new-born and older children, along with the general health carelines (Maepa & Marumo 2016:5). This promotes the rapid reduction of child mortality and improves the healthcare of the mothers and their children via health information delivery. This makes the library a platform that can facilitate women empowerment to acquire the best training and education.

Ensure Inclusive and Unbiased Education and Support Lifelong Learning Opportunities (Goal 4)

The government of South Africa understands the significance of education as a way out of poverty and illiteracy. This imperative is included in the South African National Development Plan (NDP). The NDP places more emphasis on the advancement of education, training, and innovation as major national priorities (Radebe 2015). One of the major areas in which South African libraries play an active role is in the provision of educational support. Study materials are provided to high school learners and university students. At any given time, learners, students, and researchers utilise a library's study and research spaces in pursuit of their educational activities. Furthermore, besides providing study material and reading spaces, South African libraries offer free internet access to scores of students (Radebe 2015).

By 2030, target 4.4 is anticipated to significantly increase the number of youths and adults who have applicable skills like technical and vocational skills for entrepreneurship, employment, and decent jobs (Bradley 2015:5). To improve the sustainability and prospects of the success of youths, South African libraries have agreements with different youth organisations and financially support their activities. For instance, the National Library of South Africa supported the Agape Youth Movement in publishing their book via a publishing grant. The youth formation is also given access to the library's facilities whenever an event is hosted without paying for it (Radebe 2015). In addition, internship placement opportunities are given to Library and Information Studies final year students to integrate whatever they have learnt in the university environment into a real-life practice and obtain skills that improve their chances of being employed after completing their studies. This is a working relationship that the National Library of South Africa has with school libraries and shows the part that the library plays in making sure that the country has a team of experienced library and information service personnel (Maepa & Marumo 2016:6).

Achieve Gender Equality and Empower all Women and Girls by 2030 (Goal 5)

The South African libraries are familiar with gender inequality that has created obstacles for women and girls in South Africa. It is obvious that the full potential of women is yet to be recognised because stereotypes, discrimination, and partiality are still prevailing. Women who give order and assertiveness in their leadership style, have the tendency of being disliked by their subordinates, and their ability to wield influence is mostly undermined. There is also the risk of not getting a job or being promoted when a woman is too direct (Maepa & Marumo 2016:7). Women find it difficult to connect and work in partnership with their communities, due to the external cultural, social, economic, and political barriers that continue to make it hard for many of them to attain their full potential. Women and girls must be given equal opportunities with men and boys in terms of quality education, economic resources, political involvement, employment, leadership, and managerial posts at all levels. Only through this can human dignity and sustainable development be attained. All forms of discrimination and violence against women and girls should be completely eliminated, if South African libraries can successfully reach out to those centres that are meant for ill-treated women and children through the engagement of men and boys. In this way, the film, No Strings Attached will contribute significantly to gender equality, and the gender landscape in South Africa will transform significantly if this goal can be attained (UN Women 2019). The UN anticipates having violence, discrimination, and all harmful practices against women and young girls – for example, imposed marriages and female genital mutilations – eliminated by 2030 (UNICEF 2021).

An initiative was introduced in 2003 by one of South Africa's cell phone companies in which National Library South Africa participated. This initiative is an annual 'take a girl-child to work' programme and it is aimed at providing young girls with real-life platforms to develop their thinking capacity and ambitions about their responsibility in society. It also enables them to reflect on which careers they would want to pursue after completing their high school programme. This publicity to the world of work gives prospect to the girls to be opened to the world of work and to make up-to-date career choices later on in their lives. The facts that there are still more men than women in the most high-status positions in society is still a serious concern to be pondered upon.

Decent Work and Economic Growth (Goal 8)

The SDGs are aimed at encouraging sustainable economic development by attaining higher levels of efficiency via scientific innovation. Therefore, encouraging strategies that support entrepreneurship and the creation of jobs are key to this, being effective actions to get rid of poverty and unemployment. The aim is to realise decent work and creative employment for all women and men. By the way, through the network of public libraries that is supported,

provision of working space for new small businesses that do not have enough money to rent office space in a typical rental company is also made available (Maepa & Marumo 2016:5). Entrepreneurs can also take advantage of the free internet and e-mail facilities provided by the South African public libraries to service their customers. In addition, the libraries are in the process of supporting the creativity and innovation of young people by setting up an innovative/maker-space to be used by them. This will allow experimentation with technology with a view of commercialising their innovation and ideas. Through this, the generation of revenue through start-up companies would be made possible through the creation of innovative ideas.

Strengthen Efforts to Protect and Safe-Guard the World's Cultural Heritage (Goal 11.4)

Beyond protecting the South African cultural heritage, the library is also responsible for Africa's cultural heritage protection and preservation. A lot is expected from South Africa as a member of the African Union (AU). One of the significant contributions of South African libraries on the African continent was its involvement in the restoration of manuscripts in Timbuktu (Mali) (Maepa & Marumo 2016:8). This is due to the specialised skill that libraries have in the management, preservation, and renewal of materials. The project was birthed through the mutual agreement entered into by both the South African and Malian governments. The Malian counterparts were trained how to preserve and restore rare collections by the library staff who travelled to Mali. In terms of the role played in English-speaking African countries, libraries are expected to offer leadership in staff trainings at libraries, museums, and other institutions in the preservation of materials. Furthermore, National Library South Africa, in collaboration with the office of the International Federation of Library Associations and Institutions in Africa and the Mount Kenya University presented a two-day preservation and conservation workshop for participants from Anglophone countries, in February 2015. This inventiveness forms part of the roles that libraries play to support English-speaking African countries, according to South Africa's responsibility in the AU and SADC (Southern African Development Community) (Maepa & Marumo 2016:8).

Peace and Justice: Ensure Public Access to Information and Protect Fundamental Rights (Goal 16.10)

The South African libraries are responding to goal 16.10 by offering public access to information through a dedicated public engagement programme. The purpose of this programme is to promote information access, as well as government-related information in the broader sense (NLSA 2015:26). The government of South Africa has embarked on a drive to roll out e-government initiatives so as to ensure easy access and interaction between public and

government departments. Therefore, citizens are being encouraged by the government to utilise technology to access its services because it is quicker, more convenient, and easier. Additionally, application forms can be downloaded by citizens for jobs, unemployment benefits, identification documents, and housing services, among others (NLSA 2015:26; Maepa & Marumo 2016:8).

Major Importance of the Government's Partnerships and National Support to Realise the SDGs

Most government workers and librarians believe that public libraries have a part to play in advancing lives in areas such as democracy, education, health, communication, economic development, e-government and social inclusion, and citizen empowerment. Conversely, public libraries do not have all the skills or financial resources required to provide effective public development services. Hence, more libraries are entering into partnerships with other organisations. A study conducted on Lithuanian's library directors revealed that the directors noticed about 58% cuts in their general budgets, in 2010. Therefore, a considerable number of public library directors entered into partnerships with government institutions between 2010 (80%) and 2011 (89%), and with business entities – 42% in 2010 and 63% in 2011 (Verikiene, Jonikova, & Kiskyte 2011; Fairbairn 2012). The major importance of governments' partnerships and national support to realise the inclusion of access to information, and individual access to ICT in the UN 2030 Agenda are highlighted in the subsequent subsections.

Access to Information

As information is a human right, hence, the rightful access to the correct and important information at the right time is the right of all people, regardless of their race, gender, social status, belief, or socio-economic backgrounds (South African Bill of Rights 2011:13; Salman, Mugwisi, & Mostert 2017:36).

Up-to-date decisions can be made by people to improve their lives when they have free access to information. A group of people having timely access to important information, is better off to eliminate poverty and inequity, to advance agriculture, offer quality education, and support people's wellbeing, culture, research, and innovation. SDGs are achieved through the contribution of libraries and access to information by

- supporting universal literacy, including digital, media, and information literacy and skills, with the help of committed staff;
- bridging the gaps to accessing information and assisting the government, business, and the public to realise that local information requires more attention than what is given;

- providing a network of delivery sites for government programmes and services;
- developing a digital inclusion via access to ICT;
- being committed to the serving of the research and academic community; and
- protecting and offering access to the world's culture and heritage.

Libraries, by offering access to information and expertise, are able to assist in providing opportunities for people to advance their own lives and support informed decision-making by governments, communities, and others to offer services and support that eradicate poverty and enhance people's prosperity far and wide. Figure 4 depicts the route through which information is disseminated by a library.

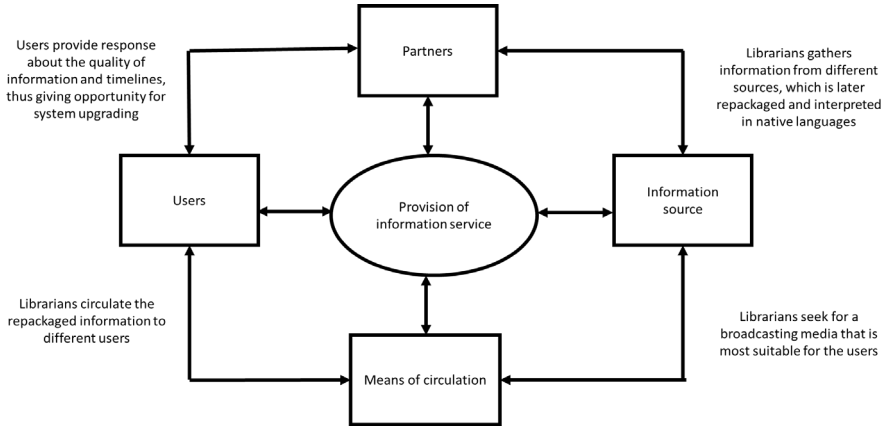

Figure 4: Chart illustrating the role of libraries in attaining SDGs (personal archive; adapted and modified from Bradley 2016:120).

Information Communication Technology

Libraries provide an essential means of reaching the next generation by supporting digital inclusion through access to ICT, with dedicated staff to help people to develop new digital skills (SDGs Partnership Platform 2021). Worldwide, 320,000 public libraries and more than a million parliamentary, national, university, science and research institutions, schools, and special libraries ensure that information and the skills to use it are available to everyone, therefore creating critical institutions for everybody in the digital age. Libraries provide the ICT infrastructure, help people to develop the capacity to effectively use information, and preserve information to ensure an ongoing access for future generations. Libraries provide an established, trusted network of local institutions that effectively reach new and marginalised

populations. Access to information is a cross-cutting issue that supports all of the SDGs (SDGs Partnership Platform 2021). Library services contribute to improved outcomes across the SDGs by advancing a digital inclusion through access to ICT, with dedicated staff to help people to develop new digital skills. Many countries have designated libraries as UN depositories, making it an important venue for information about the UN and the SDGs. Through a diverse range of programmes and services, tailored towards the needs of their communities, libraries are already supporting progress toward the SDGs, through the assistance of the government by

- increasing revenue for small-scale food producers (SDG 2);
- encouraging lasting learning opportunities (SDG 4) through the introduction of quality education and access to ICT, while developing the computer skills of library users and empowering users to be prosperous in business and employment are some of the efforts being put into supporting government objectives under its National Vision 2016;
- empowering women and young girls (SDG 5) through the provision of ICT training, particularly intended for female farmers, making sure that these women can access weather predictions, prices of crops, and assist to set-up online markets in their native languages; and
- confirming creative employment and decent work (SDG 8). This could be achieved through the support of public library computers to employment-related activities, giving room for numerous unemployed youths to apply for jobs.

Challenges Facing Libraries in the Attainment of the SDGs during the Unprecedented Covid-19 Pandemic

Covid-19 has hampered the economy, health, education, and living standards of millions of South Africans. It has also undoubtedly revealed the long-known insufficiencies and constraints in the present copyright law that adversely hinder access to information, sharing of knowledge, and the delivery of important teaching and research materials (Nicholson 2020). Strict lockdown conditions in South Africa were announced on 27 March 2020. On Covid-19 level 5 lockdown, many libraries and archives, educational institutions, as well as industries and museums were closed down on very short notice. Hardcopy study material, multimedia, and other works in libraries and related collections were totally inaccessible. Educational institutions at primary, secondary, and tertiary level were left with no other choice than to go online in order to provide teaching and material for courses. As a result, educators and librarians were directed to offer courses and other study materials through e-learning platforms, to bring about unanticipated overheads on training, technology and equipment, software, data, and other associated requirements, along

with unexpected copyright fees (Tomczyk, Potyrała, Włoch, Wnek-Gozdek, & Demeshkant 2020:10222).

The digital environment is not addressed by the existing copyright law, creating various obstacles and difficulties for educators and librarians who are putting efforts into providing study materials in very challenging situations (Nicholson 2020). Inadequate limitations and exceptions to restraining licenses, specifically e-books related, put limitations on what can and cannot be used, shared, converted, or uploaded to e-learning platforms (Nicholson 2020).

In response to the Covid-19 pandemic, libraries are working with associates worldwide to make sure that research and education continue in spite of disruptions. Also, to ensure that, while the crisis continues, the scientific and health sectors have access to the broadest range of important resources and information to support their work. The pandemic has forced libraries to restructure their operations in order to continue services for faculty and students who are now working and studying remotely – from their homes (Medawar & Tabet 2021:179). The shift to virtual learning presents specific challenges to institutions in the transition economy and developing countries where electronic information for libraries is in place. For instance, many university libraries lack an adequate ICT infrastructure or the financial capabilities to put remote access systems in place so as to ensure faculty and students to have access to subscribed e-resources from home.

To mitigate these hurdles, libraries have been active on a number of fronts, so that teaching, learning, and research can continue online, while universities are closed. The International Coalition of Library Consortia (ICOLC) statement also calls for publishers and content providers to temporarily lift paywalls on subscribed content or to develop alternative approaches for off-campus verification (EIFL 2020). Possible solutions to the challenges facing libraries in the attainment of the SDGs are provided in the subsequent subsection.

Other recurrent challenges facing libraries in the attainment of SDGs are, *inter alia* poor funding of libraries, inadequate library infrastructure, inadequate skilled manpower, poor networking among libraries, and poor policy by parent institutions, etc. (Shonhe 2019:7).

Possible Solutions to Address the Challenges that Libraries and Higher Education Institutions Face during Covid-19 Lockdowns

Under this section, the range of approaches that could be in the best mutual interest of libraries and the providers of information services are suggested. The ICOLC considers the current crisis of such significance that we cannot simply assume that libraries and publishers share a common perspective about

the magnitude of the crisis and the best approaches to cope with it (ICOLC 2020). The publishers are requested to immediately consider the following:

- Eliminating and waiving all simultaneous user limits to an institution's licensed digital content during this period when universities are going all online in order to allow research, discovery, and learning to proceed.
- Lifting current contractual interlibrary loan (ILL) restrictions or photocopying limits provisionally, so that libraries may help the students to complete their courses.
- Permitting the maximum range of copyright limitations, exceptions, and reasonable uses, even if contractually restricted, to allow institutions to continue their vital teaching missions, as campuses transition to an online remote format.
- Enable flexible renewal periods and extended due dates for payments, as the future impacts on health or business operations consortium staff who facilitate the renewal.
- Delay or abate any planned price increase until the interruption and disruption that the communities, public health systems, and stock markets are experiencing, globally calm down.
- Initiate strategies to provisionally lift paywalls or develop alternative approaches of validation to enable access to subscribed content, if traditional campus authentication mechanisms (VPNs, proxy servers) are overloaded under the increased traffic.
- Lift campus-only restrictions, so there can be a continuation of teaching activities online and remotely, regardless of university closures.

It is in the best interest of both publishers and consortia to seek creative solutions that allow critical access to publisher content for the research and public health communities. It is therefore believed that these recommendations would proffer a solid foundation for the information community, including the publishers of scholarly information, to go forward together in these difficult times (ICOLC 2020).

Suggestions on how Government Can Support Libraries in Facilitating an Actualisation of the 17 SDGs

The government of South Africa needs to improve its implementation process and prioritise assisting its libraries in the implementation of the UN SDGs. The SDGs must also be adapted and localised for local context. National governments will highlight or deemphasise several goals depending on the local situation, and will form and set local targets. For the effective measurement of progress towards national priorities, national and localised indicators need to be created. It this manner, it will be very easy to monitor the progress, which is accountable, and the government's priorities. Furthermore, the countries

will require the support of, *inter alia* the United Nations Development Groups and United Nations Development Programmes, in order to normalise the UN 2030 agenda at the local level and for priority areas to be targeted within the agenda (IFLA 2017:6).

Government expenditure and programme priorities will be designed by the NDPs. These plans can include a single national development plan with broadband, digital inclusion, and social development plans, among others. It also includes access to information and library support, quality education, poverty eradication, economic development, agriculture, wellbeing, public access to ICT, and general service delivery, culture, and all other SDGs (Dada 2016; IFLA 2014). Access to information is a cross-cutting issue that supports all areas of growth – it is more than a missed opportunity. Governments may disregard the provision of public access, information, and skills to the libraries, and fund other organisations, if access to information and libraries are not incorporated into the NDPs (Dada 2016). Libraries will be in the best position to partner with the government and others to implement national strategies and programmes that will benefit library users, by demonstrating the impact that the libraries make on the attainment of SDGs.

Lastly, South African libraries are required to develop new programmes that will purposely care for some of the SDGs that are not included in the current programme offered (Maepa & Marumo 2016:9). This will enhance the role of the libraries and make it an even more competent strategic partner in the attainment of SDGs and strategically align it to the necessities of South Africa's NDP. The libraries can only support the resourcefulness of both the government and the private sector through the delivery of information to improve the activities that the bodies carry out, as most areas covered by SDGs do not directly fall within the library domain and the South African libraries. For example, the libraries can provide information resources to researchers working in the area of energy conservation, climate change, and other professional fields acknowledged within the SDGs (Maepa & Marumo 2016:9).

Conclusion

This chapter discussed the strategic role of libraries in the actualisation of SDGs in South Africa as promoted by the government in its 2030 NDP. This places South Africa in a developmental path and assists government to navigate through the web of hurdles that it is currently facing. The challenges of the development are undeniably enormous, but attainable. A concerted effort is required from all state entities, the private sector, higher education institutions, and non-governmental organisations that function in different spaces. Therefore, it is imperative to sway the South African libraries' programmes and activities to ensure that it meaningfully contributes to the execution of the

SDGs and the strategic imperatives defined in the NDP. It was recently argued by the Africa Progress Panel which monitors the accomplishment of SDGs in Africa, that 'the attainment of SDGs is dependent on the success achieved in Africa' (United Nation Department of Public Information 2015:3). This is basically because the agenda for the accomplishment of all the SDGs indicate 2030 as the due date on the continent of Africa (Africa Progress Panel Report 2015:34). It is hoped that African countries will be likewise committed and put in concerted effort, resources, and energy towards achieving the set targets for 2030.

Lastly, there is much to be learned about what motivates effective partnerships, such as partnership structures, mutual planning, communication, connection building, handling expectations, decision-making, contracting, and costing. Partnership management is becoming a progressively crucial part of library management, as the number and variety of public library partnerships change. The SDGs can therefore be used by university libraries as a measuring tool/instrument, as well as a challenge to establish flexible objectives associated with the UN 2030 Agenda.

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Virtual Information Services During the Covid-19 Pandemic in Makerere University Library, Uganda

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Abstract

The unprecedented outbreak of Covid-19 led to disruptions in all aspects of life and the economy. Total and partial closures have characterised the pandemic period to contain the spread of the epidemic. Higher education institutions have devised new forms of existence. With the increasing mutations of the virus, coupled with slow vaccination rollouts in Uganda, e-learning remains the practical pedagogy, while electronic information resources are the vital support for learning and research in these circumstances. During the first lockdown, in April 2020, the library carried out a qualitative study on both frontline library staff and academic users. The aim of the study was to understand the experiences of use of electronic resources during the pandemic period. Among the observations of the study was a total decline in downloads from institutional subscriptions of up to about 20% in the year 2020. This finding was troubling, given prior assumptions that lockdowns would boost e-resources' uptake. Furthermore, while the library website and its aggregator tools had traditionally been assumed to be key access points for institutional resources, the study showed that most respondents preferred Google Scholar and not the library discovery tool, as their preferred key search interface. While Google Scholar worked perfectly on campus within permissible IP ranges, off campus access, as determined by the pandemic period, required a remote access tool. As such, respondents who utilised Google Scholar, experienced marked differences in the levels of access while outside the university network. Thus, the findings revealed that the library website was not the first point of recourse for most users and that this particularly affected the utilisation of e-resources. This chapter, therefore, highlights efforts to improve the use of e-resources through augmenting the website with interactive and other applications. It includes, but are not limited to, a subscription to another remote access system (MyLOFT – My Library on Finger Tips), which enables users to remotely access the library's electronic resources, using their personal accounts and internet from anywhere with more flexibility. Zoom

accounts have been established for blended information literacy trainings, complemented by social media platforms, especially WhatsApp and Twitter to facilitate seamless communication. Nevertheless, while the transition to virtual engagement offers opportunities, there are challenges as well. This chapter has chronicled and analysed the mediated undertakings of the Makerere University Library's ICT to maintain accessibility, visibility, and relevance in the face of physical isolation. It is based on the experiences of staff members at the frontline, coupled with observations of the library's social media feeds. It could be deduced that the adoption and acceleration of technological tools in the context of the pandemic were perceived as a case of *rising to the occasion*, while social media platforms were recognised as 'useful' and 'easy to use' (Davis 1989:320) applications in bridging distance and isolation. The paper also highlights factors influencing technology adoption in a critical period.

Keywords: Makerere University library; virtual information services; information literacy; social media; digital marketing; Covid-19

Introduction

The Makerere University Library emerged from a small library in 1949, housed within the main administration block. It was later constructed with seating space for 270 users and opened in 1959 by the Queen of England (Macpherson 1964:92-93, 138-140). The Main Library has been extended thrice since then, in 1962, 1972, and 2004. Currently it has a total area of 12,000 m^2 with a seating capacity of 3,980 users. In 2011, Makerere University adopted a collegiate system, with a semi-autonomous decentralised administrative structure. The implementation followed an earlier enactment of a statute for Constituent Colleges (Makerere University n.d.). New administrative units and services were established as a result, including College Libraries and positions for College librarians. Today, the library system consists of the Main Library and several College Libraries.

The library serves over 30,000 users, including students, staff, and external users. There is no requirement for the registration of users, except for external users, who are neither staff nor students of the university. The 1958 Makerere University Deposit Library Act of Parliament has empowered the library to be both a legal depository and a national reference source (cf. Makerere University n.d.). The collection includes over 290,000 titles of print books, 16,000 archival records, serials, e-books, audio visual materials, and digital records. Library users have access to over 12 million journal articles, including both subscriptions and open access, and over 240,000 e-books. Remote access to the e-collection was initially enabled through remote access software, which had been integrated into the university's mail database.

The library instituted information and communication technology (ICT) facilities in the Main and College Libraries, including computers for students and staff, discussion rooms, research and learning commons, a PowerPoint room, a multi-media unit, a music digital archive of Ugandan music, a training unit, a computer laboratory, and facilities for users with disabilities, as well as a mothers' space for expectant and nursing mothers. The library provides a variety of services that includes reference and information services, binding, photocopying, ICT and training, digitisation, document delivery services in instances where full text articles are not available within existing subscriptions, reading and study spaces, and current awareness especially with new acquisitions, changes in schedules, events, and any other relevant communication, through social media handles.

The library operates a hybrid model with a mix of print and electronic resources with an annual budget of approximately US$650,000, including grants. However, during the pandemic period, this annual government subvention was reduced by 40%.

Strategies to Support Learning and Research during the Pandemic

The Covid-19 pandemic, like anywhere in the world intensified in 2020 and Uganda experienced the first ever total lockdown in April 2020, a phenomenon that was quite new to our existence. The closure happened midway through the university's academic calendar, usually running from January through June. However, the line government ministry in charge of education devised ways of facilitating continuous learning, but with a cap on final learner evaluations. The most prudent means of engagement remained e-learning systems. This was quite a challenge since most institutions operated face-to face models with first generation distance education. Makerere University, though, had a policy in place on open and distance e-learning (ODeL), enacted in 2015. However, its adoption and implementation were sluggish with only eight courses operationalised by 2020 in student-centred blended learning. The uncertainties of the pandemic revitalised the necessity to accelerate ODeL. Consequently, the Ministry of Education issued emergency rollout guidelines that followed particular standards and infrastructural support. Institutions had to develop courses and teaching materials, and upload content in online platforms. The library had to provide support to learners and researchers. It is worthwhile to note that prior to the lockdown, the library had regular information literacy instructions. However, it was important to intensify the process. A 10 person committee consisting of professional librarians and ICT staff was constituted and transformed into a frontline force to offer support to users.

Enhancing the Library Website

The library website (Makerere University n.d.) was remodelled by the ICT team into a key communication and interaction tool. While earlier e-services mainly focused on reference queries and document delivery through e-mail and Facebook, the frontline team expanded user interaction by incorporating more digital applications. In order to enhance interactivity, communication platforms were synchronised within the library website to offer choices to users. Interactions could be channelled through Twitter, WhatsApp, Facebook, e-mail, telephone, and SMS. A simplified remote access instructional guide was posted on the website's landing page (cf. fig. 1). The facility available at that time (EZproxy) was integrated with the university's webmail database and it automatically recognised all institutional e-mails as authenticated 'passes' for remote access. Frontline staff soon realised that not every student had an institutional account, therefore a common account was created for students without institutional addresses. However, a single and collective identity for multitudinous users posed challenges with proprietary information.

Figure 1: A simplified remote access instructional guide, posted in April 2020

Appraisal of Virtual Services

With the disruptions in learning and uncertainties around the pandemic, the library as a critical knowledge centre for the university, had to prepare for all possibilities and uncertainties. The library, therefore, carried out an exploratory study to understand the experiences of our users and the frontline team during the pandemic period. The study was carried out during August and September 2020. The goal was to ascertain how online information services can be enhanced and retooled to support e-learning in the event of isolation and other limitations to physical engagement and research. The study comprised qualitative, structured interviews, carried out with academic staff (users) from all colleges and the library team. Interview questions for users mainly focussed on awareness and the use of e-resources and challenges encountered. Questions for the library frontline team targeted tasks as well as challenges in execution of the functions. Usage statistics from database proprietors and documented user queries were also analysed. Results of the study were perceived to be vital in the eventual repurposing and reorienting information services to sustain a virtual learning environment in the event that this eventually constituted a 'new normal.' As unique insights and gaps in service delivery were observed, the study served as a form of appraisal for information services.

While an increase in the use of library e-resources was anticipated, download statistics for 2020 revealed a decline of almost 20% from the previous year, 2019, from 799,463 to 657,192 downloads from subscription databases. The study found several frustrations, among users, ranging from a partial to a totally blocked access to e-resources, poor connectivity, and an inability to access resources only available in print. In trying to navigate cases of obstructed access, researchers noted that users in this category who were predominantly teaching (academic) staff, tended to utilise Google Scholar as their preferred search engine. While Google Scholar worked perfectly within the institutional network when users were on campus, access was noticeably constrained outside the university's recognised IP ranges. Similarly, database service providers regularly upgraded their systems and access protocols to insulate against cyber threats.

Although the library website had regular updates from service providers and a remote access system that would facilitate a seamless access to institutional subscriptions, researchers found that the website was not the first point of interaction or 'front door' for users. The only exception was for respondents undertaking Covid-19 related research. Most subscription database proprietors had open agreements to provide free research information on the novel Corona virus (Elsevier 2020; Emerald Publishing 2020). Frontline library staff, on the other hand, predominantly complained

about the poor infrastructure, connectivity costs (data charges) and a lack of equipment. Working from home brought additional costs and equipment that had not been contemplated. Over time, the costs of connectivity/data charges would overwhelm, and this was outside the realm of regular institutional allocations. The government had imposed a daily levy on social media referred to as over the top tax. This targeted all social media platforms. However, in the financial year, 2021/2022, there has been a replacement tax on internet data (Mwesigwa, 2021). Although reliable connectivity tended to depend on the strength of network signals, there were variations in experience across geographical locations. In addition, there were complaints about power. This eventually affected the quality of user support offered by frontline staff. Most staff used their smart phones with a limited interface and display, making it difficult to navigate when faced with complex search requests or online guidance and training.[1]

Information Literacy Instruction

Prior to the Covid-19 pandemic, the library engaged in information literacy instructions. However, findings of the study by Nalumaga and Byamugisha (2021) have revealed that user training had not been harmonised in the institutional academic programmes. The library relied on referrals from academic units mostly to train students. The problem of inefficient skills manifested in queries to frontline staff. Users without any skills to navigate e-resources across contexts and those with limited proficiencies tended to dominate inquiries to the reference desk during the pandemic. Academic staff were particularly ignorant about remote access options. Subsequent strategies, therefore, involved exploring flexible options to increase access. In October 2020, the library procured another remote access tool for IP restricted databases. The system was called MyLOFT (My Library on Finger Tips) and final subscription arrangements were concluded in January 2021. The old remote access system was kept running until the end of June 2021 to allow ample time for familiarisation with the new system.

The new system offers several advantages for both users and administrators, for example:

- The MyLOFT link is accessible on the library website to allow self registration. Self-registration grants a user a sense of ownership, thus motivation to easily navigate the platform.
- MyLOFT is downloadable as an app on smart phones and tablets.
- It allows a single sign-in on mobile apps and laptops.

1 See Nalumaga and Byamugisha (2021) for more information on findings of this study.

- The statistical function enables the library to generate usage reports per category; thus one is able to identify units (Colleges) that need support.
- It has features that allow users to save, organise, and access e-content across devices.
- It has an inbuilt share feature on which learners and lecturers can easily share content.
- The system synchronises with Google Scholar, assisting users to easily identify and access content that the library subscribes to. This feature is quite helpful for academic staff already familiar with the later search interface.
- The downloaded e-content on smart phones can easily be accessible when offline or without any internet connection.

However, the MyLOFT application was officially launched in June 2021, therefore it is quite new and still being evaluated.

To facilitate training in the new application, a short video demonstrating a step-by step registration process to the MyLOFT platform was designed and shared with all students and the Makerere University Academic Staff Assosciation social media platforms. A zoom account was assigned to the library department to support the virtual learning environment. In mobilising students, the library successfully liaised with the wider student body or the 'Students' Guild' with a turn up of over 600 students for a virtual library Information Literacy training. In between the two lockdowns that the country experienced, the library has embraced a blended approach with both onsite (where students are physically available) and remote instructions. To facilitate connectivity, Wi-Fi has been installed to enable students' access to the internet from anywhere within the university premises. The total bandwidth available for internet access is 2.8 GB up from 100mbs. These figures were obtained from the university department of ICT support. In addition, the university has engaged internet service providers to provide what is referred to as 'zero-rates' to university websites. This implies that users can access particular university sites without having to procure data bundles. The staff's digital literacy skills have been enhanced through training workshops.

Administratively, the library has prioritised the subscription of e-resources in the financial year 2020/2021. The e-book subscription, for instance was increased compared to previous years where emphasis was put on the print collection. In 2021, the e-book collections of Springer, Wiley, and Emerald Publishing have been added to the institutional subscriptions. The library has also maintained the document delivery service to users for articles that are not readily available in full text. Usage statistics for 2021 remarkably rose from 657,192 downloads in 2020 to 894,374 in 2021. The figure represents an increase in the usage of e-resources by almost 27%. This could be attributed

to the use of multiple communication and interactive channels used to reach out to users.

Digital Marketing

This section discusses developments in the marketing of services within the technological era and the adoption of social media in the processes within libraries and ends by highlighting the digital marketing strategies of the Makerere University's Library.

Oracle, a technology firm, defines digital marketing as 'the creation and dissemination of content through digital media channels and the promotion of the digital content through various platforms (Oracle, 2021), including but not limited to websites, social media, e-mail, and mobile applications. Technological advancements have transformed human behaviour and interactions, thus prompting the need to reconsider marketing approaches within the digital space as another context of human interface (Tiago & Verissimo, 2014:704). Digital marketing, thus, leapfrogged online marketing which previously dominated the internet in the 1990s and early 2000s. With online marketing, firms concentrated mainly on establishing some form of online identity through web presence and informational websites, telemarketing, and the use of e-mails and search engines to connect with potential customers.

Within the library and information services, Otobrise and Omagbon (2019:47) state that digital marketing encompasses processes and interactions leading to the promotion and sale of information products and services through means of digital technologies. An information product is defined by Rowley (2002:353) as any product whose primary or core output is information or knowledge, packaged into tangible formats/mediums or as services, for example access to a database/s. These forms include electronic journals and electronic books, newsletters, magazines, digital music, audio, video, software, and images.

Social Media

Social media can be defined as a collection of software where users can send and receive digital content over an online social network, or a digital marketing channel that can be used to communicate with consumers through advertising or a social space where people live their lives (Appel, Grewal, Hadi, & Stephen, 2020:80). Social media can also be understood to be a medium of communication, using the internet to facilitate social interaction (Xie & Stevenson, 2014:502). The definitions encompass ICT tools with the capacity to create content, to reach out, to communicate, and connect with people with minimum limitations and interference.

By design, Mirembe, Lubega, and Kibukamusoke (2019:71) argue that social media platforms' operational models encourage knowledge creation, engagement, and customisation, and therefore fit very well in learning environments, especially academic institutions. Individuals can create their world views through interacting with information, therefore these tools can be effective in engaging users. According to the Internet World Stats website (n.d.), out of the world population of approximately 7.8 billion, 5.1 billion (65%) utilised internet as of March 2021. The percentage usage in Africa was recorded at above 590 million, representing a continental penetration of 43%. It can be postulated that this population similarly subscribes to various social media applications, thus the need to fully embrace this medium in scholarly communication.

Social Media in Academic Libraries

Social media have been adopted in higher education institutions and in support services. In the university library of Mzuzu in Malawi, for instance, a WhatsApp application was introduced in 2018 to augment reference services. A study was carried out to assess its effectiveness. Findings revealed that 85% of submissions were responded to and 83% of respondents expressed satisfaction with the service, especially users in the ODeL pedagogy. However, librarians observed less reference inquiries with face-to-face educational interfaces, implying that the effective use of the platform takes place while users are off campus. Technical and other challenges were, however, cited, as well as instances of unfulfilled expectations. There were also many repetitive requests which frustrated the reference librarians. However, overall, the application was useful especially in training users in information search, and downloading information answering queries, among others (Chaputula, Abdullah, & Mwale, 2020:723, 726-727).

Another study which investigated social media applications in the digital libraries of cultural institutions, including libraries and museums, found that the most popular applications were Facebook and Twitter, followed by Flickr, blogs, RSS feeds, YouTube, and Pinterest, while the least utilised were podcasts. Information disseminated through the applications was related to the marketing/promotion of services and events, outreach, peer-to-peer connections, and information sharing. Challenges comprised of a lack of consistency and standardisation in the posts, which hindered the development of professional institutional online identities (Xie & Stevenson, 2014).

A study by Ihejirika, Goulding, and Calvert (2021:74-78) examined management principles pertinent to sustainable library social media engagement with library users and found that libraries ought to have clear goals and policies communicated and understood by staff regarding the use of social media in relation to users. Another observation was that libraries' voices

ought to be strengthened through well crafted, unique, and clear content that possess the possibility of attracting and maintaining the attention of users. A framework for managing social media was proposed that focussed on management principles and included planning, organising, and evaluation. Libraries were advised to enact policies for social media use that do not just focus on the dissemination of information but to bring onboard users in dialogue.

A study by Luo, Wang, and Han (2013:462-465) describes a more successful strategy of utilising social media in libraries' marketing campaigns in a Chinese university library. A careful process involved the understanding of users and their behaviour, especially a specific age group and their interests, the production of videos, the promotion of a popular video, as well as the distribution and evaluation of the product. The researchers succeeded in marketing their library through a video entitled, 'Falling in love with the library.' Among the success factors cited, was a thorough internalisation of users and their environment, the use of humour, the involvement of users, and the choice of a specific dissemination channel.

Literature on the use of social media in libraries suggest that libraries have taken on the interactive platforms mainly in marketing their services, but it is important that effective strategies are adopted that include careful planning and regulation. A study by Adomi and Solomon-Uwakwe (2019:14, 15, 17) on the use of WhatsApp tools in knowledge sharing among librarians in Nigerian university libraries, for instance pointed out some drawbacks in the use of the platform, for example a nonadherence to group decorum, followed by an 'avalanche' of posts that make it difficult for members to follow through, and posts by members which are deemed unsuitable and controversial, among others.

The subsequent section will examine the social media usage in the digital marketing of Makerere University Library services prior and during the Covid-19 pandemic era.

Digital Marketing Strategies of Makerere University Library before Covid-19

The digital presence of the Makerere University Library could be traced back to around 2003 when the library developed its first website, originally static, but it slowly got populated. Later on, in 2013, with the advent of social media, two applications – Facebook and Twitter – were adopted with the sole purpose of connecting with the online user community. The aim was to generate feedback from the users about the physical services and facilities of the library, as opposed to marketing. This was a strategy designed to appraise library services.

Later, the university introduced an online teaching platform, marking a noticeable increase in the use of smart phones among the students, as some teaching staff transited to the Makerere University electronic learning environment. With the introduction of the e-learning platform, the library took advantage of this development to promote electronic resources. In 2014, the usage of electronic resources gained momentum and this resulted in a high demand for online library services. Library staff assessed the usage of the library collection in 2014 and found that there was too much pressure on the limited bandwidth, leading to a slow download time. Consequently, the two social media platforms (Facebook and Twitter) that had been created, were blocked in 2015 by the Directorate of Information and Communication Technology (DICTS), a department that regulates ICT services and facilities at the university. The blockage lasted for three years with the intention of maximising bandwidth for teaching and learning. By 2013, the university was subscribing to only 100mbs. At that point, the assumption about social media usage by university students was for personal and mostly entertainment usage, rather than academic purposes. Thus, video sharing sites, for instance YouTube, were blocked on the university internet. The situation has improved as the current subscription for 2022 is 2.8 GB of bandwidth for the entire university network, according to the DICTS support at the Makerere University. With improved bandwidth and internet access points including wireless connections in key study areas, all social media platforms are thus supported.

In 2019, Makerere Library staff benefitted from professional development programmes from the University of Pretoria, where they had inductions in the use of social media as an important tool in teaching and learning. The management of library services held discussions with the university's ICT supervisor at the DICTS, about the developments and request to unblock the two social media platforms and allocate the library's additional bandwidth. Usage was monitored from one of the students' computer facilities, the Learning Commons, where the biggest number of students were accessing Facebook and Twitter on library computers. The library found it necessary to promote its services and facilities using platforms already ascertained to be popular among the student population. Two librarians were identified to manage the social media platforms and to regularly post content, review comments, as well as respond to users' queries and comments. In February 2020, a librarian was sponsored to specifically undertake a course in Digital Marketing at the In-depth Research Institute in Nairobi, Kenya. After the training, the staff member applied the new skills acquired, including the use of online tools such as Canva.com to design online marketing content. This resulted in an increased number of online library followers between December 2019 and March 2021, from 12,390 to 14,250 on Facebook and from 894 to 2,455 on Twitter.

Thus, before Covid-19, the social media platforms were mostly used for the provision of current awareness services, especially announcements that included alerting users of the new developments in the library as well as informing them of the new information materials added to the collections. Examples are indicated in figures 2 and 3.

Figure 2: Some of the current awareness services posted online

This figure portrays the university librarian, Dr. Helen Byamugisha (in blue coat), the Vice-Chancellor, Prof. Barnabas Nawangwe, (holding a book), and the Japanese ambassador (right), on the occasion of receiving donated books on Japanese culture, and establishing a Japanese corner in the Main Library. To the extreme left is Prof. Edith Natukunda of European and Oriental languages in the College of Humanities and Social Sciences, Makerere University.

Figure 3: Communication on changes in the library's operational hours during the graduation week

Digital Marketing during the Pandemic Period

Social media platforms have been instrumental in designing and disseminating information on library resources and services. During the pandemic period, posts and posters that promoted simplified access to electronic resources were designed and uploaded on the website and on the library's social media platforms, as indicated in figures 4 to 6.

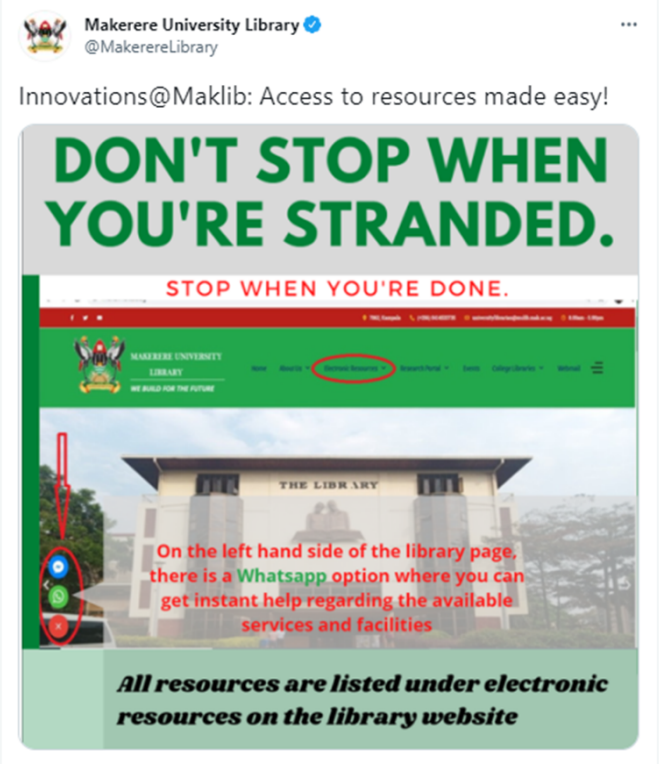

Figure 4: A screenshot of one of the Tweets aimed at promoting electronic resources

In order to increase the visibility of the library website, the link is embedded in the social media posts. This is expected to multiply the number of visitors on the library website who in turn gain access to other resources on the website. The social media team observed that keeping an active social media page, generates more followers and in turn a wider coverage. Every post brings in a new follower. Since March 2020 to December 2021, followers on Facebook have increased from 13,183 to 14,250, while Twitter has shown an increase from 1,035 to 4,120. Library staff members are constantly encouraged to retweet the posts so as to improve visibility. The Vice Chancellor, Prof. Barnabas

Nawangwe, continuously re-tweets library posts and this brings in more views on the page since he too has a considerable following[2] on his Twitter handle. Figure 8 shows the numbers on the library's Twitter handle.

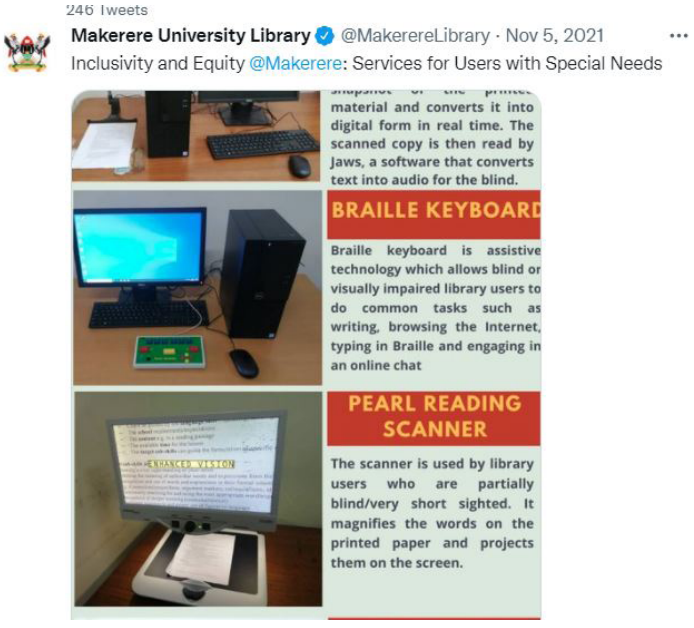

Figure 5: Services for users with visual impairment

Figure 6: Guidelines for thesis uploads

2 His followers amount to 49,600 (figure taken on 19 January 2022 from @ProfNawangwe's handle).

Figure 7: Post of MyLOFT, a system used to access library resources remotely on Twitter

Figure 8: Number of followers on Twitter

Another observation made by the frontline staff is the importance of instituting a social media marketing plan. The plan determines when, what, and who should post on an institutional platform, as well as the frequency. As the feedback functionality is crucial in social media management, the Makerere University Library's social media team constantly checks out every post to respond to comments. In addition to Facebook and Twitter platforms, the library introduced an instant messaging tool, WhatsApp, on its website. WhatsApp is considered to be one of the most used social media platforms among university students. Subsequently, users have been able to chat with the reference librarian in real time and feedback regarding different inquiries is provided immediately. Such possibilities of WhatsApp use in libraries had been highlighted by Arbani and Abdulla (2017:518) in relation to digital marketing. The proposed usage included the selective dissemination of information to different user groups and real time response to user issues. The WhatsApp

features of mass communication to groups, private chat provisions, as well as video and audio, make it appealing as an interactive platform. This serves the purpose of improving user satisfaction. A study of undergraduate students at the University of Brunei Darussalam found that most undergraduates utilised WhatsApp – 96% of a total of 156 respondents, almost three hours per day. The popularity of the application was attributed to its ease of use, ease of communication, instant messaging and relative cost-effectiveness in quick information retrieval and transfer. Students found the application convenient in sharing information in relation to their studies, group discussions, and assignments (Ahad & Lim 2014:192).

Figures 9 and 10 demonstrate some of the queries and feedback.

Other reference queries processed through social media are presented in table 1.

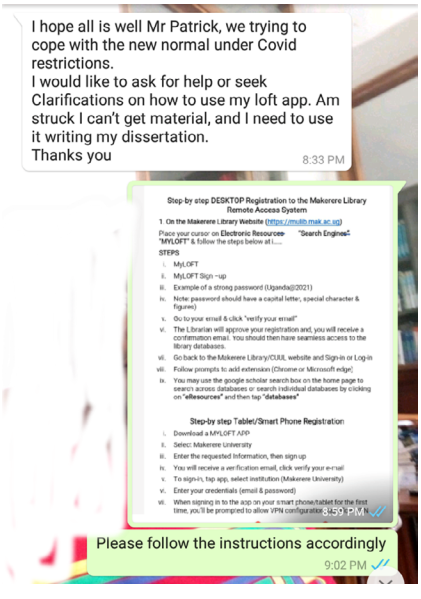

Figure 9: Screenshot of chats with users and the reference librarian on WhatsApp

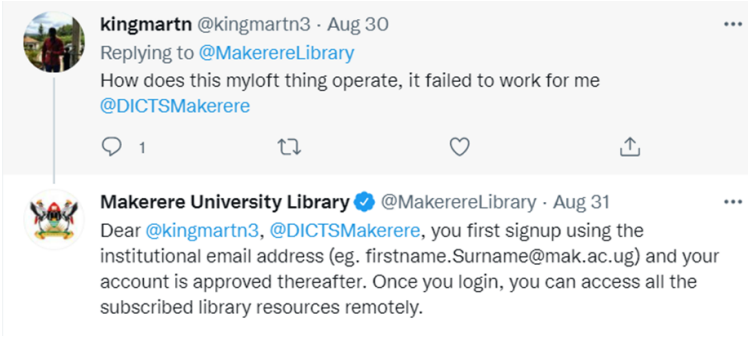

Figure 10:Inquiry and feedback on the MyLOFT application

Table 1 demonstrates requests received by the Main Library. Samples were gathered from the WhatsApp platform feeds. This is by no means exhaustive, since it only focussed on queries from the reference librarian which average five to eight queries per day. The sample is meant to provide a clue on interactions from the social media platforms, which are managed by the reference librarian in the Main Library. The feeds exclude feedback from College librarians. Most requests are predominantly submitted through the library WhatsApp tool, and a simple analysis reveals that the majority concerns access to library resources and facilities from both students and staff. The library reference team observes that information literacy trainings often stimulate user interest and inquiries. Most inquiries tend to follow from users and academic units with a prior interface with the e-resources training team. Although the sampled queries reflect more female than male users, it would be misleading to presume a gendered perspective, since all queries were not included.

Table 1: Online information accessed via social media – WhatsApp tool

S/N	Date	Information required	Subject/ discipline	Category of the user	Gender	College/Unit
1	08-01-22	Guidelines on uploading research output into the institutional repository	Law	Staff	Male	School of Law
2	03-01-22	Granting submission rights to upload research into the repository	Information Technology	Student	Male	College of Computing and Information Sciences
3.	16-12-21	Information on accessing library electronic resources	Social Works and Social Administration	Student	Female	College of Humanities and Social Sciences
4	20-12-21	Reviewing the library website/ correct errors identified on the webpage	Website	Staff	Male	Public relations office
5	04-11-21 21-12-21	Information regarding printing services/ Braille for users who are visually impaired	Education	Student	Male	College of Education and External Studies
6	16-12-21	Accessing Electronic dissertations	Literature	Student	Female	College of Humanities and Social Sciences
7	25-10-21	Accessing Electronic resources remotely	Literature	Staff	Female	College of Humanities and Social Sciences
8	25-03-20	Thesis on functional characteristics of intensive care units in Uganda and their 28-day patient mortality	Medicine	Staff	Male	Public Relations Office
9	28-03-20	Login details for library electronic resources	Law	Student	Male	School of Law
10	03-04-20	Online Master's and PhD dissertation	Education	Student	Female	College of Education and External Studies
11	06-05-20	Details to gain access to research for life databases	Not specified	Student	Male	Not specified
12	07-05-20	Login details for library electronic resources	Education	Staff	Female	College of Education and External Studies
13	25-05-20	Journal article on Africa's and China's strategic partnership	Computer Science	Student	Female	College of Computing and Information Science

S/N	Date	Information required	Subject/ discipline	Category of the user	Gender	College/Unit
14	26-05-20	Link to Makerere University job application portal	Library and Information Science	Student	Female	College of Computing and Information Science
15	27-05-20	Application details for a Master's programme	Computing	External user	Female	Not specified
16	04-06-20	Login details for library electronic resources	Engineering	Student	Female	College of Engineering, Design, Art and Technology
17	17-06-20	E-books and dissertations on the environment	Environment	Student	Female	College of Agriculture and Environmental Sciences
18	24-06-20	Login details for library electronic resources	Psychiatry	Student	Female	College of Health Sciences
19	25-06-20	Login details for library electronic resources	Not specified	Student	Female	Not specified
20	08-07-20	Dissertation on Graphic Rating Scales, Open Behaviour Observation Scales, Procedural Justice and ratee satisfaction in performance appraisal of secretaries of Makerere University	Human resource	Staff	Male	College of Humanities and Social Sciences
21	14-07-20	Journal articles on energy consumption	Renewable energy	Student	Male	College of Humanities and Social Sciences
22	24-07-20	Login details for library electronic resources through Lib hub	Not specified	Student	Female	Not specified
23	01-08-20	Access to Makerere Institutional Repository (MakIR)	Library	Staff	Female	Sir Albert Cook Medical Library, College of Health Sciences
24	04-08-20	Simplified guide to accessing electronic resources	Library	Staff	Female	Main Library
25	07-08-20	Inquiries on the reopening of the Main Library	History	Staff	Male	College of Humanities and Social Sciences
26	14-08-20	Guide to accessing electronic resources	Not specified	Student	Female	Not specified

Opportunities Presented by Virtual Platforms during the Pandemic Period

The capacity to engage through interactive tools remains important in linking people (Ternenge 2019:3, 6 of 11). The physical distance is bridged by virtual connections, and within a service unit, there are several possibilities, for instance in marketing. The Makerere University Library has been able to proactively engage users and disseminate pertinent information about the services. Social media have thus provided more opportunities for the library to reach out to students and staff as well as the external user community. The information posted and used on social media is flexible and changes can easily be made to content compared to print media. In other words, virtual interactive media offer a fast method of appraising library services.

In reference to information literacy, remote instruction has enabled access to a multitude of users more than would be possible in a physical environment. Normally, the training venues of the library's e-resources accommodate a maximum of 33 students/users, while one example of an online tutorial registered up to 100 users at a time. In one case, one of the users was from another country, which would have been impossible without virtual support. Eventually, there are prospects for the democratisation of education with possibilities of wider access through online platforms. Other benefits include the capacity for a single message to be shared by several users simultaneously, the facilitation of instant feedback from users, making it easier for the library to improve on service delivery and to meet the relevance question, and the possibility to measure the impact of posts through sharing and re-sharing. This can be based on the number of views and the number of times information is shared and/or liked on Facebook and Twitter.

It is important to note that most feedback in the library's virtual encounters, especially with the virtual information literacy instruction, has been positive with the exception of perpetual connectivity issues and difficulties in practicum or practical sessions.

Challenges Experienced by Staff and Users in the ICT Mediated Information Services Landscape

Several challenges have been mentioned in the transition period. By far, connectivity remains the biggest handicap to the virtual experience, since users are geographically dispersed with variances in network capacity and strengths. The intermittent participation and concentration of users have been of concern in all e-sessions where participants are in and out, on and off sessions. The effectiveness of the virtual pedagogy becomes a challenge, with an inability to sustain continuous concentration.

In Uganda, data costs were initially slashed by more than 50% during the first half of 2020. However, the national financial forecasts of 2020/2021 proposed and introduced new levies of up to 12% on data, which diminished prospects of meaningful continuous learning in an era of unpredictability during the pandemic. Another notable challenge from library instructors included managing the technology, since this has been their first experience online. Some users were nostalgic and missed the emotional and physical contact. One of the main interactive platforms especially for young people, Facebook, was closed by the Uganda government during the election season in January 2021 and remains so, which limits choices and creates a big gap, since most users in Uganda prefer Facebook to Twitter due to its unlimited number of characters in a post (Olupot 2021).

While the virtual work environment may be flexible and with a wide reach and offers around-the-clock accessibility, in some instances, frontline library staff have expressed their concerns about a gendered expanded workload, especially when schools had been closed for a long time. Female staff narrated that 'home duties' disproportionately weighed heavy on their shoulders, especially where young families were involved. Duties included home schooling and domestic work, which extended the workload of the female staff. In a specific case, a female staff member intimated that at times she worked up to 1am in the morning, just to complete all her duties.

Again, the social media environment is notorious not just with unverified 'fake' information, but also with the intensity of human emotions. The digital librarians in Makerere have talked about experiences with insensitive and 'rude' patrons/users and the delicate balance in handling adverse circumstances.

The adverse side of the platforms are also compounded in studies by Latif, Hussain, Saeed, Qureshi, and Maqsood (2019:136) as well as García Gómez (2020). Latif *et al.* (2019) who carried out a study on social media and smart phones in medical education. The researchers observed several barriers including addiction that sometimes distracts and diverts the attention of students, cyber-bullying, workloads, time constraints, issues of maintaining privacy and integrity, multitasking and managing social media accounts which could disrupt academic performance, while excessive use could create difficulties in normal face-to-face interactions (Latif *et al.* 2019:136). García-Gómez (2020) examined WhatsApp as a learning tool in a cross-cultural analysis of British and Spanish university students. The researchers found that while students were using the application in group work, there were perceptions of language competency which in turn fuelled insecurities, eventually impacting on interpersonal relationships within the group discussions. Again, participants from diverse cultural settings found that there was an excessive utilisation of colloquial language and slang in

communication which negatively affected the use of the WhatsApp tool within a learning environment (García-Gómez 2020).

Conclusion

This chapter intended to highlight efforts by the Makerere University Library to improve the access and use of virtual services in an emergency situation. The library employed several technological tools, including revamping the website with social media and instant messaging applications to make it more interactive. Other measures included a subscription to a new flexible remote access tool that directly responded to user concerns. Information literacy has been enhanced, using a blended module. Digital marketing of these services was done, and also incorporated feedback. Accrued benefits included flexibility, wide coverage, reduced costs of operation, improved user engagement and feedback. and increased downloads which are an indication of the increased usage of e-resources, among others. The library can thus be perceived to have 'risen to the occasion' through the adoption of several technological tools to provide services.

The integration of the WhatsApp tool on the library website has gone a long way in providing instant feedback to users. WhatsApp has several advantages, especially its versatility which makes it popular among the university user community. Most of the interactions have been registered through the WhatsApp tool. Therefore, among the technological tools adopted during the pandemic period, the WhatsApp tool can be assumed to have been both 'useful' and 'easy to use' by the library and the user community. *Perceived usefulness*, *perceived ease of use,* and *attitude towards use* have long been considered useful constructs in understanding and determining technology acceptance and transfer. Other factors in adoption, besides beliefs in technology, include identification of external variables (Chau 1996:186-187; Taherdoost 2017:962-963). For the case of Makerere University library, Information literacy instruction, has been intensified, as one such external variable, to boost utilization of electronic resources.

However, there is a need to develop appropriate and clear strategies to market digital content as well as standardising content to appeal to users so that there is an optimal appreciation of information services and engagement of users in a virtual environment.

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The Courage to Lead with Small Things like Kindness

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Abstract

During Covid-19, many people lost loved ones, be they friends or family members, while others struggled with depression, and many felt anxious and overwhelmed. This chapter examines how in the workplace, particularly an academic library, it is possible to offer staff members support as they grieve, deal with depression and/or anxiety, and feel overwhelmed. Drawing on two data sets, the chapter explores how a caring form of leadership was exercised in the library at the University of Johannesburg and what impact this had on the wellbeing of the staff.

Keywords: Depression; anxiety; grief; Covid-19; leadership

Introduction

The impact of the Fourth Industrial Revolution (4IR) and the extraordinary global crisis in the form of the Covid-19 pandemic have shaken our world. This chapter explores leadership innovations and insights gained by working with the library staff at the University of Johannesburg (UJ) in South Africa during the first 18 months of the pandemic. The chapter draws on two data sets:[1] Semi-structured interviews and a survey questionnaire, asking the staff about their experiences of the pandemic and its effects on their lives. Overall, the data showed that 80% of the staff were negatively affected by Covid and experienced heightened levels of grief, depression, anxiety, a feeling of being overwhelmed, and a lack of control. At the same time, they also felt a high degree of purpose, motivation, and hope, with 90% of the staff reporting that they felt supported by the library at UJ – all or most of the time. The chapter explores the intervention put in place by the library and argues that a courageous form of leadership is required that focusses on the 'small things' like kindness, compassion, listening, and placing employee needs at the centre

1 Ethical Clearance Number: REC-01-153-2019, as issued by UJ Humanities Ethical Clearance Committee.

of the organisation. For the society to globally overcome the grief, depression, anxiety, lethargy, and post-traumatic stress experienced by so many people due to the multiple effects of Covid (Semo & Frissa 2020), workspaces need to become spaces of support and healing. This chapter outlines interventions put in place by the library to support its staff during the period of April 2020 to October 2021, and lessons learnt from this experience.

This chapter is divided into three sections. In the first section we discuss the methodology used to do this research which draws on semi-structured open-ended interviews and an online questionnaire. The second section details the key findings showing how more than half of the respondents reported feeling depressed, anxious, and overwhelmed during the first 18 months of Covid. The findings also point to the fact that several of the interventions put in place by the library were helpful to the staff. Therefore, the third section explores the interventions put in place to support the staff. In this section we look at the support given to people struggling with grief and how we tried at the UJ library to prevent grief from being a taboo subject that should not be spoken about and should be ignored. We also outline the principles we used to try and keep the staff feeling motivated, hopeful, and experiencing a sense of purpose in what they were doing.

Methodology

The research for this chapter is based on two data sets that explore the lived experiences of the staff in the library at UJ between April 2020 and October 2021. During this time, several 'small' interventions were made with the staff, which are discussed in the chapter. In the interviews and questionnaire, people report on their experiences and the impact of the interventions. In November 2020, 25 staff members were selected from a staff total of 142 people. They were interviewed by one of five staff members who had received interview skills training. Each interviewer did interviews with people who did not work in their division, and for whom they were not the line managers, while the interviewees were also not the line managers of any of their interviewers. For these interviews, five people from each division within the library were randomly selected. The staff members were asked semi-structured open-ended questions about their experiences, working during the first seven months of Covid. The questions were clustered around three themes: Technology, emotional wellbeing, and the lived experience of working from home during the pandemic. The questions which focussed on technology, asked if they had the technology they needed, had learnt how to use it, and what challenges they might have around technology. The questions on emotional wellbeing focussed on illness because of Covid, grief because a loved one had died of the virus or during the pandemic, anxiety, depression, their sense of control over

their lives, as well as their sense of hope, motivation, and purpose. The third section focusses on their work experience, if they felt they received the support they needed, if there was clarity in what was expected of them, if they felt their line managers were giving them the guidance they needed, and if they felt connected with their colleagues. Using Atlas TI, the interviews were analysed, using thematic and content analysis. From these interviews it became clear that the supportive intervention put in place during 2020 by the library management team to support the staff, was regarded as helpful, and further interventions, discussed later in the chapter, were then put in place during 2021. In October 2021, an electronic questionnaire was sent to the staff who could voluntarily complete it anonymously. Each question in the questionnaire was designed on a five-point Likert scale, asking staff members to reflect on their experiences during the pandemic. In total, 39 of the 142 library staff members from all divisions within the library answered the questionnaire. To ensure that the data remained anonymous, and information given did not affect staff members' relationships with each other, google forms were used, and the e-mail addresses were hidden from the research team. The questionnaire focussed on the same three themes/issues discussed in the interviews the year before. A Likert scale was used because this type of quantitative data is well suited to operationalise personality traits or experiences. By using a positive and negative framing of questions, the reliability of the data was enhanced. The data were treated as ordinal level data, therefore enabling us to get an overall impression of the common experiences or findings of the respondents. This type of data collection and analysis was used as it enabled us to record in a measurable way the quantitative experiences of staff members, which could then be discussed in statistical measures according to the different themes and topics.

Key Findings

From these two data sets, three issues arose as key for the library staff at UJ during the first 18 months of Covid. The first was learning to use new technologies. In the interviews and questionnaire, 95% of the staff reported that learning to use new technologies had been an extreme learning curve for them and they had learnt a lot of new skills. Much has been written about organisational leadership and technology (Groscurth 2018; Kelly 2018; Temelkova 2018; Du Preez & Sinha 2020) and the disruption of sectors and reshaping of socio-economic systems that are and will be brought about by it (cf. Oosthuizen 2017). Therefore, this chapter will not focus further on that.

The second area of impact was the negative emotional impact that Covid had on the staff. In the questionnaire, 80% of the staff reported being negatively impacted by the pandemic. Overall, 41% of the respondents reported having

experienced the loss of a family member and/or close friend. Yet, in leadership and management research there is a lacuna on grief, trauma related to grief in the workplace, and how to lead a group of people where many are grieving at the same time. Research by Gilbert (2007) shows how grief is usually hidden and ignored in the workplace. The study of Tehan and Thompson (2013) shows how underprepared most leaders are to deal with grief in the workplace as it remains one of the last workplace taboos. This chapter aims to contribute in some way to fill the gap on how to lead one's staff who are dealing with grief.

The third issue to arise from the data, first came out in the interviews done at the end of 2020, suggesting that while people felt higher than normal levels of anxiety, depression, a lack of control, and a sense of being overwhelmed, they also felt motivated, that their lives had a purpose, that they were supported, and that they had hope. These findings were echoed in the questionnaire done in October 2021. In this questionnaire, 72% of the respondents sometimes or most of the time felt overwhelmed, 64% felt often or sometimes depressed, and 44% felt anxious all the time or most of the time. Yet 59% of the respondents reported feeling hopeful all or most of the time, 58% said they felt motivated often or most of the time, and only 8% reported having little or no sense of purpose. Overall, 56% of the respondents reported feeling supported by the library all the time and 33% felt supported by the library most of the time. In this chapter, we outline the type of support that was exercised by the library management team,[2] assisting the staff being in vulnerable emotional spaces, resulting in them feeling that they had the support, motivation, sense of purpose, and hope they needed to get through this difficult experience. Primarily this chapter focusses on how to lead people who are dealing with grief and the kind of interventions that can be put in place to support them. In this way the chapter fills a lacuna in the literature on leadership. Building on the idea of humanistic leadership, below are five interventions we put in place in the library, and how they worked.

Leading People who are Dealing with Grief

Our research found that 41% of the respondents had experienced the trauma of mourning the death of a loved one. More than once, people were dealing with multiple deaths in the space of a few weeks or even days. One colleague shared in the interview that he had lost his mother, wife, and grandfather to Covid-19 in the space of ten days. A week after burying the last family member, he was back at work. In one interview, a middle-aged woman, Tumi,[3] who had lost her mother and husband in close succession, said, 'It was so hard you know,

2 In the UJ library, the management team refers to all the people who are line managers in the library and have people reporting to them.

3 Pseudonyms are used throughout, and no reference is made to the division in which people work in order to keep their identities confidential.

because my mother would have helped me to deal with my husband's passing but now, she is also gone because of the virus' (Interview Tumi 5 November 2020). People grieving multiple deaths in a family are also dealing with the reality that the very people who would have supported them through the death of a loved one have also passed away. At the same time, they are dealing with high anxiety levels about who will die next, worrying about when they will get sick, and dealing with multiple other uncertainties caused by the pandemic. A staff member, Sarah is in her forties. She has lost her sister to Covid, saying, 'I worry if it will be me next and then what will happen to our children…um…I am now looking after my sister's children' (Interview Sarah 8 November 2020).

The extensive literature on dealing with grief and bereavement (e.g., Staudacher 1987; Sanders 1989; Humphrey 2009; Altmaier 2011; Worden 2018) highlights that it is a process that takes time, and there are several stages that people go through, from anger and disbelief, through depression, and finally to acceptance. No one grieves in the same way, and different people go through the stages in various ways. Lehr and Vaughan (2021) argue that a humanistic leadership style is needed to help people grieve, find resilience, and overcome loss during Covid-19.

Provide Clarity and Certainty

When people are grieving, the world seems overwhelming and confusing (Attig 2018:7). A grieving person starts by feeling shocked, then they protest against the reality of the death of a loved one, and then they enter a time of disorganisation (Attig 2018:9-13). Staff members in the library reported feeling overwhelmed by work demands yet wanting the order and security that their work gave them. They felt like they did not know how to respond to the trauma of death and found it a relief to be at work because, 'I know what is expected and how to act' (Interview Sarah 8 November 2020). As a leader, a meaningful way to help people is to give clear instructions and create order and certainty for them by being clear about what you expect, by when and how the work should be done. As leaders, we need to remember that people who are grieving and are back at work are in a valuable space in which their world is entirely disorganised on an emotional level. They are trying to find a new identity as a widow, widower, a parent who has lost a child, or a child who has lost a parent. Giving them clarity about what is expected of them at work, helps them to feel that at least one area of their life has clarity. Thembi who had lost several close friends said, 'My life feels upside down. I don't know what to do. Um… but my line manager is always clear about what I need to do at work. That…um…helps so much.'

Reduce the Workload

The line managers in the library tried to help colleagues to decide what work is urgent and what can be deferred or done by someone else. Giving clear guidelines about the reduced workload for the next three months, and then reviewing how people are coping was regarded as very supportive. This gave people time to breathe but also made it clear that they are valued and their input is needed; they are not being sidelined forever, as employees in the study of Groopman (2004) felt when they were grieving and back at work.

Focus on Routine Work and not Innovation or Creative Problem Solving

In the space of grief and trauma, people are less creative and often have less innovative solutions to problems (Groopman 2004). Grieving colleagues were asked to focus on more routine work, which enabled them to develop a sense of order in their work lives if not personal lives too. Knowing what to expect from people who are grieving, helps managers to create realistic expectations. Through this process people felt that they were supported and that the expectations were manageable.

Focus on People's Strengths

A key challenge that people are facing when they go through trauma is that they quickly feel useless and unable to do things (Groopman 2004). This is mainly because they are dealing with the loss of their own identity, the loss of a key support structure/person and the loss of confidence in themselves (Epstein & Epstein 2010; Parker, McCraw, & Paterson 2015). Therefore, it proved helpful to encourage people to focus on the work they enjoy and are good at, rather than their weaknesses or work they struggle to do. This enabled them to rebuild confidence at a time when they were feeling vulnerable.

In the UJ library, we tried to implement these strategies. In the interviews we did with our staff, people whose line managers could implement this, reported feeling supported and managed to continue working. There were divisions where more than one person was grieving simultaneously, where it was more challenging to reduce people's workloads or allow them only to focus on the things they were particularly good at. In these divisions, the staff reported feeling overwhelmed and struggling to cope emotionally with their work. Grief affects people deeply on an emotional, social, and physical level. While the above strategies helped the grieving staff members to cope with their workloads, it did not address the social aspect of grief. Below are a few examples of what was done in the library to deal with grief on a social level and remove the silence and taboo around grief in the workplace.

Developing a Workplace Environment that Acknowledges Grief

Reflective Conversations

The library aimed at creating a space where people felt they could legitimately bring their grief to work and did not need to hide it. At the end of 2020, we held guided conversations with small groups of colleagues in which everyone reflected on and then shared their experiences of life during Covid. The conversations were very simple – we asked six key questions:

- What/Who have you lost this year?
- How has Covid and your experiences of the pandemic impacted you physically?
- In this year, what achievement are you most proud of?
- What challenges did you face during this time?
- How has Covid impacted you emotionally?
- What have you learnt this year?

People wrote down one sentence answers to each question on separate pieces of paper, which they kept anonymous. Once everyone had written down their responses, we put all the pieces of paper up on a wall and shared them with the group. People found it encouraging to see how many issues overlapped and reported feeling less lonely when they saw how others had had the same experiences. What made the engagement so powerful was that people shared on a deep and personal level because the notes they wrote were all anonymous, and no one knew whose ideas or feelings were being read out by the exercise leader. The comments from the staff about this exercise are summarised by James who said, 'I felt truly seen' (James, a man in his early fifties lost a child to Covid). James said that he was 'allowed to bring his grief into the workspace,' stating, 'I didn't have to hide anymore' (Interview James 4 November 2020). This sentiment was echoed by most of the staff, and they reported feeling better when they saw that they were not alone or unique in battling with a loss. In September 2021, we ran an online workshop for staff in the library and at UJ on dealing with grief in the workplace. This hour and a half workshop, another way in which we brought the conversation about grief to the workplace, showed that grief was not a taboo subject. Gianpiero Petriglieri and Sally Maitlis (2019) highlight that grief is still one of the biggest taboos in the workplace and how few executives talk about grief or allow people to speak about it. Petriglieri and Maitlis (2019) argue that healing is not possible if people cannot speak about their grief in the workplace where they spend most of their time.

Sessions of Remembrance

Early in 2021, we held an online session of remembrance for staff who had passed away or wanted to remember family and friends who had died during the pandemic. We asked different people to read poetry, share a song, read out the names of all the people who have passed away in the organisation, as well as the names of family members of the people who worked in the library. This offered people a space to take a break in the business of work and recognise that many people are mourning and finding the experience of Covid challenging. People reported that this was a powerful way to acknowledge death and embrace grief rather than ignore it in the workplace. While the session offered a space of healing for many people, it took on an unplanned Christian focus as people said Christian prayers and talked about how God (meaning the Christian God) was helping them in their grief. This alienated non-Christian colleagues.

Sharing how We are Doing

During the pandemic, many line managers began meetings asking, 'What are you struggling with this week, and would you like to share your experience?' When we first started, people shared non-threatening issues, but over time they shared more personal matters. This might seem stylised, but the online and hybrid environments required us to become more intentional about creating spaces in which we could share, connect, and engage with each other (Chanana 2021). In the pre-Covid world, these conversations would have happened organically around the water cooler or in the tearoom, but now they had to be 'created.' The feedback from staff was that these encounters made them feel as if they were being heard and supported. By the end of 2021, a remarkable 48% of the respondents to our questionnaire reported feeling supported by their line manager all the time and 28% felt supported most of the time. In the 4IR and online environment, the staff said they quickly felt their humanity was 'being lost.' One person reported in the interviews at the end of 2020, 'You can feel like they (managers and co-workers) have forgotten that you are human' (Interview Themba 13 November 2020). Yet at the end of 2021, people said that these discussions with their colleagues made them feel like they were working with other people who recognised their personal struggles.

The second way in which we encouraged connection was through our wellness task team. In this team of 12 members, each person was given about 10 staff members to look after. The wellness task team members would phone those in their care group, mainly when people were grieving, sick, or feeling particularly down. According to many staff members, these phone calls were a powerful space of hope, connection, and recognition. This echoes findings in the study by Hazen (2003) on perinatal grief: When women worked in

companies that created a culture of listening and support, the workplace became a space where they experienced healing.

Grief has not been the only emotional challenge faced by our staff during the pandemic. In the questionnaire completed during October 2021, 18 months after the start of the pandemic, 64% of the respondents self-identified as struggling with depression some of the time or a lot of the time, while 2% were depressed all the time. When asked about their levels of anxiety, 65% self-identified as being anxious a lot of the time or quite often, whereas 10% felt anxious all the time. Among the people interviewed by the end of 2020, over a half of the staff talked about feeling depressed, anxious, and overwhelmed, yet also feeling that they had a purpose, being motivated and hopeful. They reported that it was the support they received at work that was helping them feeling as if they still had hope, purpose, and some degree of motivation. Sloman, Gilbert, and Hasey (2003) show that a sense of failure, a lack of motivation, and purposelessness often accompany depression and anxiety. This was one of the findings that inspired us to follow up the 2020 interviews with a questionnaire by the end of 2021 to see if the feelings of support, hope, motivation, and purpose continued or were just part of the unique situation experienced in 2020. In this next section, we outline key interventions that helped to maintain this sense of purpose, motivation, hope, and a sense of being supported.

Leading with Hope, Purpose, and Motivation

As a leadership team in the library, we focussed our efforts on leading people with hope and purpose, motivating them to keep on going. We did this by encouraging people through phone calls from line managers to staff, short motivational videos by the Executive Director sent out on WhatsApp to the staff, reflections by the Executive Director on the emotional difficulties of the lockdown and the pandemic and how to deal with it, shared with the staff in the weekly library staff newsletter, clarity about people's roles, the goals of the library, recognition for people's and teams' achievements, and acknowledgment of the obstacles and difficulties that people faced. Our engagements were informed by an awareness of three factors which often drive depression and anxiety. The first is the hero complex, the second is the feeling that we are never good enough, and the third is a lack of self-worth.

The psychiatrist, Ahmed Hankir speaks powerfully about the hero complex and depression in his talks called *The wounded healer*. Dr Hankir, a practicing psychiatrist, does research on how best to help people with depression, anxiety, and mental distress without relying solely on medication (Hankir 2021). He has struggled with debilitating depression and talks about it in his research and public lectures. His research shows that feelings of lethargy,

unhappiness, suicide, sadness, or being uninterested in life, do not always accompany depression. Instead, depressed people can often be over achievers who feel the weight of the world on their shoulders. They believe that if they are not the hero to rescue the work situation, family, and community, then everything will fall apart, and it will be their fault. In times of crisis, it is easy for leaders to overload themselves and the people they work with in order to 'keep going.' We did not necessarily get this right in the library, but we did communicate that a hero complex can be a sign of burnout and depression which people should be aware of.

Depression also manifests in the form of sadness, being withdrawn, having a lack of self-worth, feeling unloved, or feeling rejected (Sloman *et al.* 2003:108). To this end we tried to place a lot of emphasis on recognising people and motivating them by helping them feel that they had a purpose and were important. In doing so we tried to deal with the reality that depression can also come about when people feel that they have no value and are not wanted or needed, as the study of Gilbert (2000) highlights. One line manager held weekly feedback sessions with their staff called, 'The good, the bad, and the extra-ordinary,' in which the staff were all given a chance to express what they had done in the week. These sessions were a space in which the whole team could congratulate each other on small and big successes and support each other if they faced challenges.

Third, our staff engagements also centred on an awareness that with depression and anxiety, people often feel that they are not good enough. In the interviews done in 2020, several people reported that the pandemic was making them feel that they were not good enough. Many women said that they did not feel as if they were good enough at supporting their families, or being good enough as friends, largely because it was not possible to physically meet with friends and family members. Donald Winnicott, a paediatrician and psychoanalyst working in the 1950s and 1960s, developed the idea of the 'good enough mother' (Ratnapalan & Batty 2009:239-241). He argued that mothers needed to be 'good enough, not perfect.' The same principle of the good-enough mother can be applied to being the good enough employee or the good enough colleague. Our wellness task team tried to inspire people to be available to and caring for one other person at work, in this way being a 'good enough colleague.' This encouraged people to be aware of the small things like kindness, compassion, listening, and taking people's needs and emotional realities into account. Our focus was not on achieving big successes, but on the small acts of kindness.

Conclusion: Leading with Small Thinking

The pandemic has turned our world upside down. Semo and Frissa (2020) argue that the pandemic has increased the levels of anxiety, depression, and other mental health illnesses in most population groups. They found that 45% of the adults in the US and 33% of the adults in the UK reported feeling anxiety and stress during Covid. In China, 92% of the inpatients who had overcome Covid, experienced post-traumatic stress. The research of Semo and Frissa (2020) in Southern Africa shows that in this region there have also been heightened levels of depression and anxiety. They argue that these mental health effects of the pandemic are even more challenging to address and support in Southern Africa, where there is a chronic shortage of mental health workers and support. In the interviews and questionnaires done with the library staff at UJ, 64% of the respondents felt depression sometimes or most of the time, while 65% of the respondents said that they felt anxious. Among this cohort, 41% said they were grieving the death of loved ones and 80% reported feeling negatively affected and overwhelmed by Covid.

> *Research on the effectiveness of leaders during and after the COVID-19 crisis should examine an array of activities, including the degree to which remote leaders are persuasive if they (a) clearly state their values that will guide institutional actions, (b) understand and openly discuss the travails and hopes of their collectives, (c) clearly communicate an ambitious vision of the direction that the unit will head toward, and (d) demonstrate confidence that strategic goals can be achieved (Kniffin, Narayanan, Ansell, Antonakis, Ashford, Bakker, Bamberger, Bapuji, Bhave, Choi, & Creary 2021:70).*

While these activities of leadership are important, and this chapter has given examples of how the leadership team at the UJ library has tried to do this, it does not go far enough. We argue that we need a form of leadership that actively and intentionally aims to create healing spaces in workplaces. If we do so, employees will be able to heal from the various traumas and stresses brought about by the pandemic. In this chapter we argue that this requires a leadership style that focusses on 'small things' where regular 'small' interventions of kindness, understanding, compassion, and listening are enacted, creating a workspace where people can heal. The idea of thinking small is a shift away from the neoliberal capitalist economy and its values, as it gave us only a few tools to cope with the Covid crisis. In this chapter we outlined some of the important interventions that the staff in the UJ library did during the first 18 months of the pandemic. The two data sets used to measure staff wellness in the library suggest that while 41% of the staff were grieving and many people felt depressed, anxious, and overwhelmed, most of the staff

also felt motivated, hopeful, and that they had a purpose, as a remarkable 56% of the respondents reported feeling supported by the library leadership and their colleagues all the time. As workspaces enable people to begin to heal from the ravages of Covid, it will enable people to engage once again in the creative, innovative problem-solving behaviour that is essential in the 4IR.

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