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Across continents: A comparison of African and Australian academics' online preparedness

Abstract

The COVID-19 pandemic has disrupted higher education across the globe, in particular the shift from face-to-face teaching and assessment, as well as interaction with students. In 2020, an online survey was distributed to African and Australian higher education academics to gather insights into academics' transformation of educational practices during the early stages of the COVID-19 pandemic. In particular it focused on the effects on the quality of teaching, learning and assessment. The survey questions investigated the comparison of the use of teaching and assessment technologies prior to, and during the COVID-19 pandemic; academics' experiences with the sudden shift to work-from-home (WFH) arrangements and quality assurance measures for digital technologies. The sample included 71 academics across 12 Australian universities/tertiary institutions and 278 academics across 21 African higher education institutions. This study identified that while many Australian academics had prior experience and training in online/blended delivery, African academics, despite not having formal training in digital pedagogy, rated themselves as more than average in their ability to adopt technology for the online environment, just as the Australian cohort had. The most effective online tools adopted during the crisis in the African region were Zoom and WhatsApp while in the Australian region the learning management system (LMS) was the most popular. The major factors that affected African and Australian students' ability to engage online included lack of access to connectivity and devices, technological competency and emotional and social factors. The results suggest that the predominant challenges faced by students as reported by academics across both continents in the "forced" remote work environment other than general anxiety about COVID-19 were social isolation (Aguilera-Hermida, 2020), connectivity for their students and the lack of a balanced work life (Kotteeswari & Sharief, 2014; Oliveira et al., 2021). This study has implications on institutions' readiness in terms of capacity building for academic staff, infrastructure and support during digital delivery of courses.

Keywords: *Academic readiness, digital capital, transition, work-life-balance, online teaching*

1. Introduction

The academic world has undergone significant upheaval during the global pandemic known as COVID-19. With this

upheaval, universities have had to change the way they deliver their teaching and learning. Regulators, policymakers and even students are now focused on digital deliveries. This suggests that the emphasis may be pivoting more towards digital teaching and learning because of the outcome of the COVID-19 pandemic.

The global phenomenon raises numerous questions in terms of higher education adaptability and the readiness of the sector to deliver online teaching and learning in such a crisis. The rapid changes have, without doubt, influenced the way that education is delivered and the pedagogical readiness of academics in the delivery and design of lessons including the assessments that are administered to gauge understanding (Pokhrel & Chhetri, 2021). In addition, technological readiness of institutions and staff skills to deal with the "tools of the digital trade" to handle this change are critical factors for effective delivery and to ensure effective learning continues through monitoring of student participation and patterns of their engagement to inform academics how to scaffold learning effectively (Vonderwell & Zachariah, 2014). Higher education institutions (HEIs) implement e-learning in various configurations, which are influenced by several factors. One of the most important factors is the "training of staff" at these HEIs. An example of this is where an institution of one of the authors of this paper recognised this shortfall in their staff and implemented a series of teaching and learning workshops in online tools to enable efficient delivery of their unit. "While institutions, academics and students are trying to wade through unfamiliar waters, the initiatives undertaken … to support both academics and students are commendable. Within a short period of just five weeks, the foundations for the transition from face-to-face to online remote teaching, learning, and assessment, have been laid" (Singh, 2020).

To ensure quality assurance and success of e-learning programmes, it is essential to determine the digital capital afforded by individuals and by the higher education institution. According to Ragnedda 2018:1) "digital capital is the accumulation of digital competencies and technologies" and includes a range of components including equipment, connectivity, time spent online, support and training, information and literacy, communication and collaboration, content-creation, safety and problem-solving. Ragnedda (2018) asserts that the digital capital influences the digital divide and that a number of factors will affect an individual's digital capital including gender, income, educational level and urban versus rural users (Townsend *et al.,* 2013).

The focus of the research inquiry is around the level of preparedness of academics to this change in order to support online teaching and learning in full or partial blended models due to the COVID-19 pandemic forcing social isolation. Moving to online teaching and learning requires an understanding of the differences in pedagogical approaches of quality. Pedagogy defined by Daniela (2019) refers to a branch of science on how to provide learning. The pedagogy in teaching face-to-face, blended or fully online needs to be adapted accordingly, however, key elements remain unchanged such as learning as acquisition, participation and as knowledge creation (Hong & Sullivan, 2009). This particular study looks at the preparedness of academics in terms of adapting to different approaches to quality online teaching and infrastructure readiness in a developed and developing continent to ascertain similarities of factors or differences that were faced during this period of delivery. In particular, the research looked at understanding the first-hand experiences, as well as adaptation and reworking of teaching policies that occurred in Australia and South Africa, during the early stages of the COVID-pandemic. Through this comparison we highlight the journey of academics in a developed region such as Australia and a developing region such as Africa.

2. Literature review

2.1 Adapting to online learning and teaching

Since 2020, higher education institutions, along with other educational sectors, have had to pivot quickly to online learning, teaching and assessment practices, regardless of readiness and preparedness. The research literature since 2020 on the broad topic of the "COVID-19 impact on higher education" has been growing rapidly in the past two years identifying close to 26 thousand results via a search engine (i.e. Google Scholar). The full quality of the papers is not known or reported in this paper. Early literature highlights the main challenge being faced by students as their own mental attitude and mindset towards working from home during the self-isolation period (Bao, 2020). An extensive literature review on the transition to e-learning includes strategies for successful implementation, such as: supporting academics through training, creating online learning communities and an incorporation of extending more blended components to didactic models of face-to-face teaching (Turnbull, Chugh & Luck, 2021). Jang and Tsai (2013) refer to interrelated teaching knowledge: pedagogy, content and technology as a powerful tool for contemporary educators.

The literature pre-COVID-19 was supportive of the need for the higher education sector to rapidly adapt to technology even though they may have been viewed as challenging and expensive (Glasby, 2015), and that many faculty members may not feel ready to teach online (Downing & Dyment, 2013; Lichoro, 2015). Prior to the COVID-19 pandemic, few higher education institutions offered online delivery, and many were not prepared for the transition (Archibald *et al*., 2019; Leung & Sharma, 2020). Four areas are seen as critical to academic readiness for online learning including: knowledge, importance (attitude), readiness and confidence (ability) (Martin, Budhrani & Wang, 2019).

The rapid move meant that there was an immediate response financially and physically to adopt and adapt to technology, including new pedagogical challenges (Blewett 2016), and infrastructure capacity and capabilities. Many universities did not have online capabilities, resources or academic capacity to transition to the sudden online delivery. Usual adaptations to online learning modes require academics to prepare well in advance and up to six to nine months prior to delivery (Hodges *et al.,* 2020). Badrul Khan's e-learning framework (Singh & Nair, 2021; Khan, 2021) offers eight dimensions for consideration when embedding digital technology, namely: institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethics. Each of these dimensions in the framework represents a category of issues that need to be addressed in order to create a meaningful learning experience.

As the world moves forward with the COVID-19 pandemic, higher education institutions will need to continue to support staff appropriately for online teaching with quality professional development, resourcing and technical support, and at the institutional level with leadership, infrastructure and evaluation (Stone & Springer, 2019). A combination of regular and timely communication between academics and students, along with an interactive and actively engaging course design, online students can be more effectively engaged, supported and encouraged to persist within the online learning environment (Stone & Springer, 2019).

2.2 Technologies utilised in online teaching and assessment

Transitioning to teaching in the online space rather than the traditional face-to-face model requires a high level of effort in the design and delivery to ensure motivation, engagement

and an effective change to learner achievement (Oliver *et al.,* 2014). There is no one technological tool or approach that can be applied to an entire cohort of students as students also need to be capable and open to the new digital engagement and uptake (Bennett, Maton & Kevin, 2008). The rapid changes in the pedagogical approaches will have varying effects on students' abilities to interact at the most effective and efficient level. A number of learning management systems (LMS) such as Blackboard and Moodle are readily used in Australia and can be designed to inculcate students into what is referred to as "transmissive" pedagogies that do not necessarily allow for creativity, critical thinking and social interactivity (Oliver *et al*., 2014). However, a skilled academic proficient in online teaching can create teaching and learning opportunities that are creative, innovative, interactive and engaging (Pokhrel and Chhetry, 2021).

The importance of maintaining interpersonal communication and interaction between academics and their students has been an important criterion in maintaining quality teaching, learning and assessment (Martin *et al.,* 2019; Radu *et al.,* 2020; Rapanta *et al.,* 2020). As such, a number of other digital technologies using video conferencing tools such as Zoom, Microsoft Teams, WhatsApp, Blackboard, and Moodle to name a few, have been extensively used as a method of synchronous, web-based conferencing to keep students engaged through virtual communication (Radu *et al.,* 2020). Some noted advantages of using Zoom have been identified as rapport, convenience, simplicity and user-friendliness (Archibald *et al*., 2019; Radu *et al.,* 2020). The Zoom platform had reached 200 million users per day (up 1,900%) by early 2020 (Valet, 2020). In one study of the mobile instant messaging application known as "WhatsApp" whereby it is free to users to download, send unlimited messages, pictures and videos and any cost is associated with the user's own data plan and internet access, students reported a high agreement with the app in learning whatever/wherever/whenever and in their own style. Overall, it was seen as a useful learning platform (Rahmadi, 2020).

However, regardless of the technologies used, the research on learner performance outcomes shows that the instructor's design efforts that address learners' cognitive and social needs rather than simply the technology itself (Oliver *et al.,* 2015) make a positive difference in learning outcomes (Rapanta *et al.,* 2020). A meta-analysis of comparative research reported that, on average, students in the online mode performed modestly better than those receiving face-to-face instruction and that a blended approach also included additional learning and pedagogical aspects not received by students in a face-to-face mode (Oliver *et al*., 2014). It also highlights the high level of effort required by academics to ensure quality online pedagogy that the rapid changeover in practice may not have allowed in most higher education institutions in such a short period of adaptation.

2.3 Accessibility to the internet

Digital inequalities existed pre-COVID-19 and have been highlighted and exemplified in the COVID-19 pandemic period with billions of people in isolation having to access online education (Beaunoyer *et al.,* 2020; Ragnedda *et al.,* 2018). Having online access to technology has become a privileged channel as Beaunoyer and colleagues have reported (Beaunoyer *et al*., 2020) for governments, health organisations and major national organisations to communicate messages and recommendations. The digital infrastructure is a key factor in a country's economy and ability for workflow, imports and exports, and efficient delivery of services to its population (Zachreson *et al.,* 2021). The COVID-19 pandemic has highlighted the differences between continents, countries and social groups in their accessibility to technology, capacity

to utilise technologies, digital literacy and competence and engagement across cultural and global contexts (Beaunoyer *et al*., 2020).

Digital inequality places those who are digitally disadvantaged at greater risk. The ongoing inequalities will only grow with greater and longer remote learning and work practices as COVID-19 continues and needs to be addressed and supported by governments globally. Digital coverage of 5G networks in sub-Saharan Africa is at zero per cent whereas in Australia it is 75% (Telstra, 2021); 4G networks is 53% and internet adoption at 38% (Katz, 2020). Whilst Australians have good access to the internet, the digital divide can also exist depending on income, internet availability and the ability to self-isolate during COVID-19. Financial security in Australia is geographically clustered and concentrated, and occupations with greater income security such as higher education academics were and are able to work from home successfully (Zachreson *et al*., 2021). The implications for educators will depend on their location and their own digital capital to work remotely and in their academic preparedness to manage the transition to online teaching in such a short timeframe. The implications for higher education institutions are in the education and support of their academic workforce in effective online teaching and learning practices that support students and optimise remote learning (Martin, 2020).

2.4 Working from home

Working from home (WFH) has become a normalised act across the globe as people are unable to leave home. Many academics have worked and are still working most or a portion of their time from home, which has brought with it many adjustments to WFH arrangements. A number of challenges, benefits, sustainability and impact on relationships were reported in the Australian WFH context (Singh, Nair & Watson, 2021), outlining the importance of future adaptations to the future of academic work. Numerous challenges were outlined including: an increased workload, having to learn new technological skills and managing families at home. Australian academics have been generally more negative in the COVID-19 pandemic period about WFH. Isolation has been identified as a key source of distress, as well as in causing difficulties in communication (Westar *et al.,* 2020).

In the African context, the key challenge faced by academics was internet access by students, followed by general anxiety (Singh & Nair, 2021). Some of the benefits have been the cost of workspaces and equipment, reduced commuting time and related expenses, and an increased flexibility in working hours. Most academics stated they could sustain WFH "indefinitely" with 65% in Australia (Singh, Nair & Watson, 2021) and 48% in the African context (Singh & Nair, 2021). The ongoing WFH arrangements mean that higher education institutions must continue to grow with many new technological investments made by universities to manage WFH and as staff gain proficiency in utilising the technologies (Pennington, 2020).

3. Theoretical framework

The need for a carefully thought-out process for successfully transitioning to online learning is emphasised by Badrul Khan (2001) who proposes eight dimensions and sub-dimensions in his e-Learning Framework, see Figure 1.

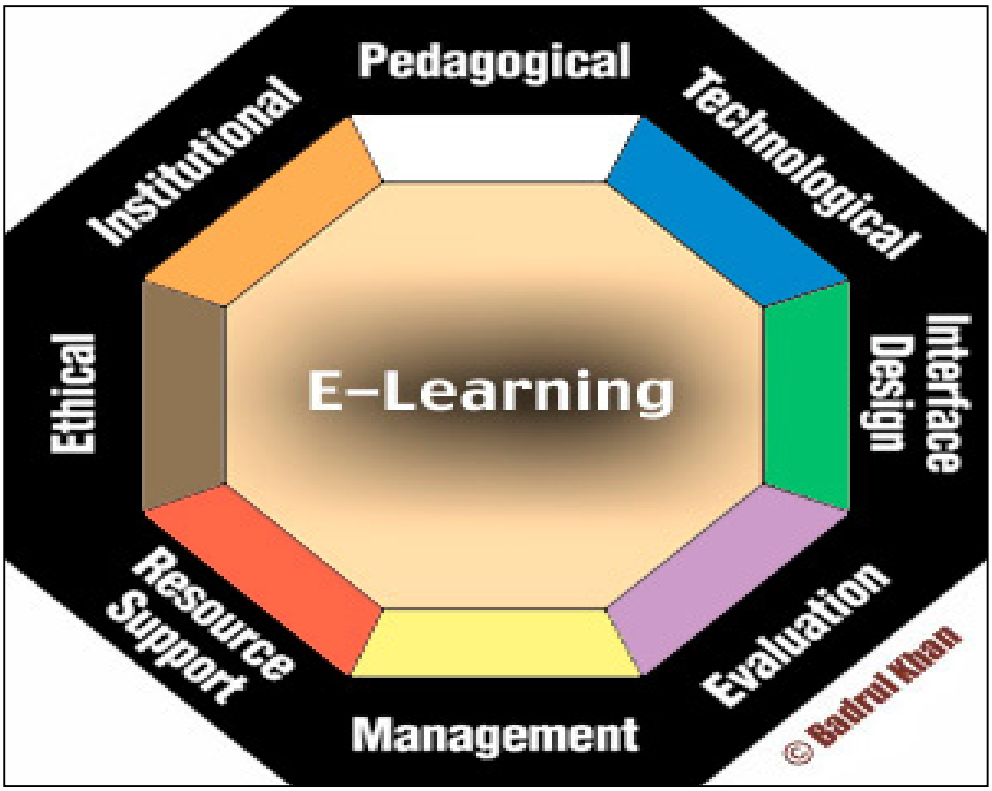


Figure 1: Eight-dimensional e-learning Framework (Khan, 2001)

According to Lightfoot (2016), the Khan framework considered the factors that affect the successful delivery of e-learning at 3 levels: Learner, Academic Staff and Institution. This framework urges institutions to answer the question: "*What does it take to provide the best and most meaningful flexible learning environments for learners worldwide?"* The institutional dimension is concerned with issues of administrative affairs, academic affairs and student services. The pedagogical dimension of e-learning refers to teaching and learning. The technological dimension of the framework examines issues of technology infrastructure in e-learning environments. The interface design refers to the overall look and feel of e-learning programmes. The management of e-learning refers to the maintenance of the e-learning environment and distribution of related information. The resource support dimension of the framework examines the online support and resources provided in the learning environment. The evaluation dimension explores the assessment of learners and the evaluation of the instruction and learning environment. The ethical considerations of e-learning relate to social and cultural diversity.

The study draws mainly on the technology and pedagogical pillars of the e-learning framework by Khan (2001) to investigate academics' preparedness for the involuntary shift to the online space.

4. Methodology

This research falls within a larger study on the impact of the COVID-19 pandemic on academics at higher education institutions in a number of countries. Ethics approval for this overall study was received from the University of KwaZulu-Natal, South Africa, as per Protocol Reference Number HSSREC/00001284/2020.

An online questionnaire, using a Google Form, combining qualitative and quantitative questions was developed by aligning the questions to five pillars of the octagonal e-learning framework by Khan (2001). The pillars explored in this study were the technology, pedagogy, institution, resource support and ethics pillars. Quantitative questions were designed to investigate the usage and adoption of technology for teaching, prior to and during the COVID-19 pandemic; while the qualitative questions were designed to capture academics' perceptions, feedback and experiences with the transition to online teaching and assessment.

The focus of this paper is comparing African and Australian academics' readiness for the online space. Hence the dataset includes academics from both continents – Africa and Australia. In the African study, selective sampling was adopted to ensure a sufficient range of private and public based institutions, while in the Australian study, a combination of selective and random sampling methods helped the researchers achieve this balance of representation.

While 45 contact based HEIs (whom the researchers had access to/were referred to by colleagues) in the African region were invited to participate in this study, gatekeeper consent was received from 21 institutions. Thus, in the African study, the online questionnaire was electronically distributed to 9,229 academics at 21 contact-based (7 private and 14 public) higher education institutions in seven African countries, namely: Ghana, Liberia, Mauritius, Nigeria, Namibia, South Africa and Zambia. In the Australian study, the survey was disseminated through numerous methods including: direct email invitation to academic staff within the universities/institutions, postings on academic forums such as the Higher Educational Research Society for Australia (HERDSA) mailing list and on the researchers' own LinkedIn pages, to over 2,500 academics. The final sample achieved in the African study was 278 academics from 21 HEIs. Similarly, the Australian sample achieved was 71 academics across 12 Australian universities/tertiary institutions. As per the required ethical procedures in South Africa, gatekeeper consent was obtained prior to the distribution of the questionnaires in Africa and Australia. Data collection commenced during the early stages of the initial lockdowns experienced on both continents in 2020, at the start of the COVID-19 pandemic, and was open for a period of six weeks. The online survey took approximately 15 minutes to complete and was anonymous. While the demographic data were collected identifying the university, role and years of experience, all reporting was anonymous.

Quantitative data were analysed through statistical analysis using SPSS, while qualitative data were analysed through thematic analysis. This paper presents the quantitative results. The calculations and interpretation of the statistics in this paper have been verified by a professional statistician. The qualitative aspects will be presented in a subsequent publication.

5. Results

The current paper focuses on a comparison of Africa and Australia regarding:

- academics' preferences of technology to support online teaching;
- academics' experiences with the shift to a forced "work-from-home" situation;

- quality assurance measures in place during the sudden shift to online teaching and assessment; and
- the general impact of the COVID-19 pandemic on academics.

Results of these individual studies have been extracted from the authors' two publications that emerged from this project (Singh & Nair, 2021; Singh, Nair & Watson, 2021).

5.1 Demographics

A total of 349 valid responses were received cumulatively (278: Africa, 71: Australia) from public (61.9%: Africa; 71.9%: Australia) and private (38.1%: Africa, 28.1%: Australia) institutions. The demographic distribution of the respondents is summarised in Table 1 below.

In the African dataset the majority of the participants (86.3%) were between the ages 31 to 60, while the majority of the participants (59.2%) in the Australian dataset were between the ages of 41 to 60. Females (58.6%: Africa, 64.4%: Australia) dominated both studies, with most of the respondents in both studies (95.3%: Africa, 97.2%: Australia) holding a postgraduate degree. With respect to the academic hierarchy, lecturers (51.4%: Africa, 40.8%: Australia) held the highest participation rate in both studies, with many (37.4%: Africa, 43.7%: Australia) participants having experience in academia for more than 16 years. The majority (82.0%: Africa, 57.7%: Australia) had permanent tenure.

Table 1: Demographics summary

Variable/categories	Frequency (Percent): Africa	Frequency (Percent): Australia	Variable/categories	Frequency (Percent): Africa	Frequency (Percent): Australia
Age			**Experience**		
20-30	19 (6.8%)	4 (5.6%)	1 - 5	68 (24.5%)	13 (18.3%)
31-40	81 (29.1%)	12 (16.9%)	6 - 10	62 (22.3%)	12 (16.9%)
41-50	77 (27.7%)	20 (28.2%)	11 - 15	44 (15.8%)	15 (21.1%)
51-60	82 (29.5%)	22 (31.0%)	16+	104 (37.4%)	31 (43.7%)
>60	19 (6.8%)	13 (18.3%)	**Institution Type**		
Gender			Private	8 (38.1)	20 (28.1%)
Female	163 (58.6%)	45 (63.4%)	Public	13 (61.9)	51 (71.9%)
Male	115 (41.4%)	24 (33.8%)			
Rather not say	0 (0%)	2 (2.8%)			
			Academic Role		
Qualification			Tutor	4 (1.4%)	4 (5.6%)
Undergraduate degree	12 (4.3%)	2 (2.8%)	Lecturer	143 (51.4%)	29 (40.8%)
Postgraduate degree	265 (95.3%)	69 (97.2%)	Senior lecturer	57 (20.5%)	17 (23.9%)
Tenure			Associate professor	43 (15.5%)	14 (19.7%)
Permanent	228 (82.0%)	41 (57.7%)	Full professor	17 (6.1%)	6 (8.5%)
Contract	50 (18.0%)	30 (42.3%)	Other	14 (5.0%)	1 (1.4%)

5.2 Adapting to online teaching

The study focused on determining the impact that the COVID-19 pandemic had on the primary teaching method at each of the institutions – outlining the three dominant types, that is contact based (face-to-face), online learning (no face-to-face), and blended learning. Figure 2 shows that there was a clear shift from face-to-face learning (91.7%: Africa, 87.3%: Australia) and blended learning prior to the COVID-19 pandemic (30.2%: Africa, 33.8%: Australia), to online learning during the COVID-19 pandemic (83.5%: Africa, 91.5%: Australia).

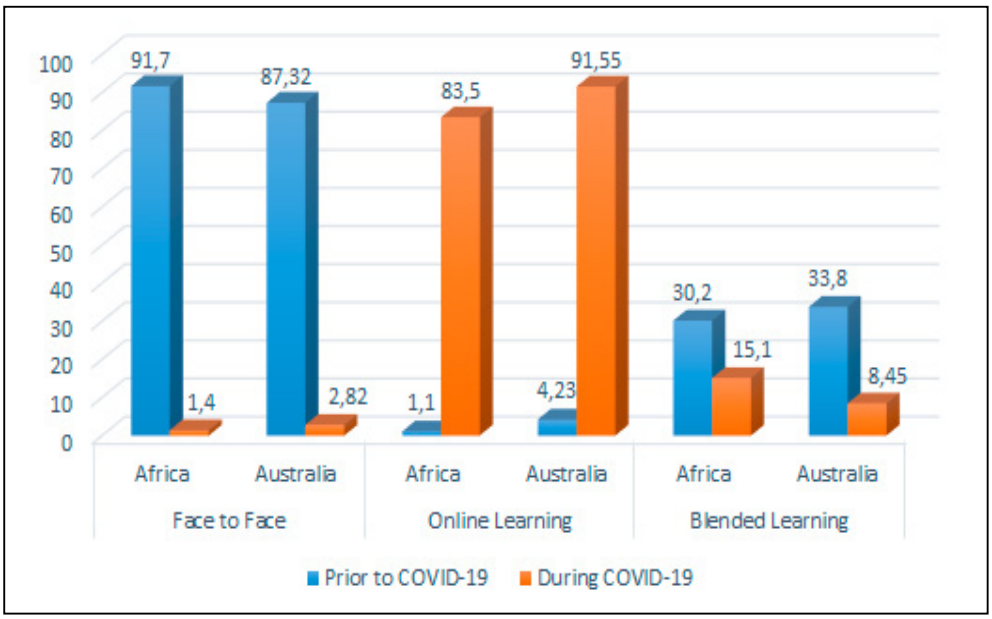


Figure 2: Comparison of primary teaching method adopted

Results from Fisher's exact test revealed no significant relationship between the type of institution and the use of any of the three teaching approaches investigated prior to or during the COVID-19 pandemic. In the Australian dataset there is a significant relationship between the type of institution and the use of a blended approach prior to and during the COVID-19 pandemic ($p<.0005$). In Australia, a significant proportion of the private institutions did not use a blended approach (pre- and intra-COVID); while, in Africa, a significant proportion of public institutions adopted a blended approach prior to the COVID-19 pandemic.

5.3 Technology adopted to support online teaching and online assessment

The study explored the technology and pedagogical pillars of the e-learning framework by Badrul Khan (2001) through a series of questions that aimed at ascertaining academics' proficiency in the implementation of technology to support online teaching, learning and assessment.

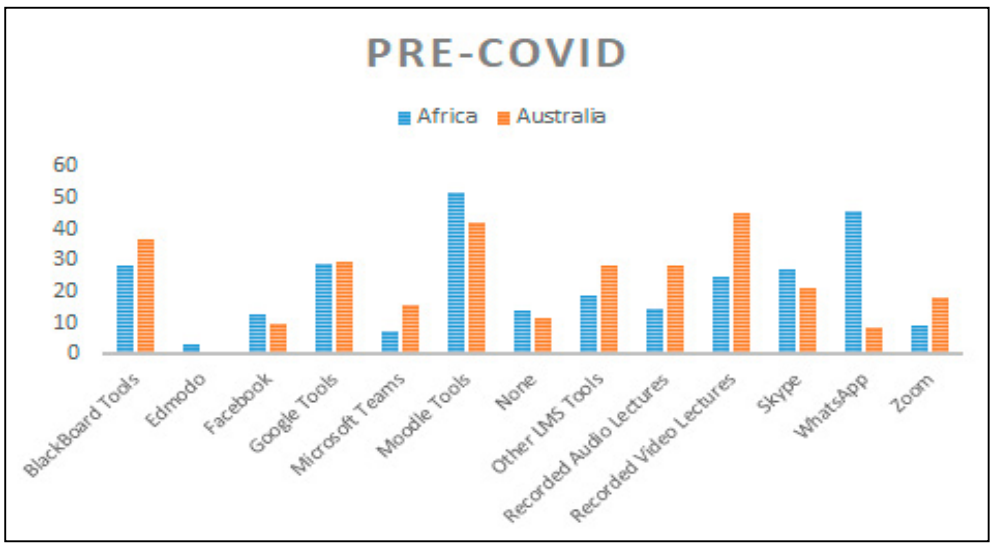
The first section of the questionnaire focused on understanding the difference in technology adoption methods prior to and during the COVID-19 pandemic. Respondents were asked to rate their proficiency in adopting online teaching methods and online

assessment methods using the scale from 1 (poor) to 5 (excellent). A one-sample t-test was applied to test if the average proficiency rating was significantly above or below an average rating of "3". Results showed that proficiency ratings were significantly above average for both teaching methods (mean rating = 3.74, p<.0005: Africa, mean rating = 4.15, p<.0005: Australia) and assessment methods (mean rating = 3.36, p<.0005: Africa, mean rating = 3.85, p<.0005: Australia). This indicates that the respondents rated themselves as better than average, tending towards excellent, in their proficiency in adopting technology for teaching and assessment in both studies.

Respondents also rated themselves as better than average, tending towards excellence (mean rating = 3.32, p<.0005) in their students' responsiveness to online support. Significantly more respondents indicated that they would most likely continue with online learning post the COVID-19 pandemic (mean rating = 3.22, p=.001).

An independent samples test indicates that in Africa, proficiency ratings for adopting online assessment methods in private institutions (mean = 3.96) is significantly higher than in public institutions (mean = 3.30), p=.001. No significant results were identified in the Australian dataset when comparing the private and public institutions.

The tools adopted by academics to support online teaching, prior to and during the COVID-19 pandemic are compared in Figure 3 below.



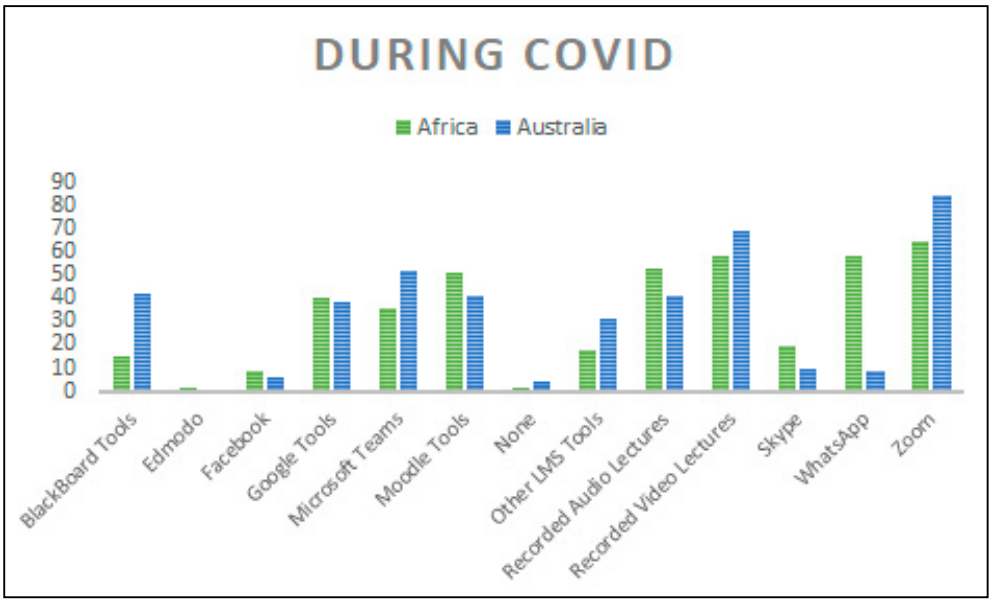


Figure 3: Comparison of teaching tools adopted

As illustrated in Figure 3 above, the top five teaching tools adopted by African academics prior to the COVID-19 pandemic were Moodle Tools (51.4%), WhatsApp (46%), Google Tools (28.8%), Blackboard Tools (28.4%) and Skype (27%). In Australia, the top five teaching tools adopted prior to the COVID-19 pandemic were recorded video lectures (45.1%), Moodle Tools (42.3%), Blackboard Tools (36.6%), Google Tools (29.6%) and recorded audio lectures (28.2%).

During the COVID-19 pandemic, in Africa, Zoom topped the list (64.7%), followed by WhatsApp (58.3%), recorded video lectures (58.3%), recorded audio lectures (52.9%) and followed finally by Moodle Tools (50.7%). In Australia, during the COVID-19 pandemic, Zoom topped the list (85.5%), followed by recorded video lectures (69%), Microsoft Teams (52.1%), Blackboard Tools (42.3%) and Moodle Tools (40.8%).

A Binomial test was conducted to identify if a significant proportion of the sample responded "Yes" or "No" to the usage of each of these tools prior to or during the COVID-19 pandemic. Results suggest that the only tools significantly selected for use in Australia were Zoom (85%, $p<.0005$), and recorded video lectures (69%, $p=.002$). Among African academics Zoom (65%, $p<.0005$), recorded video lectures (58%, $p=.007$) and WhatsApp (58%, $p=.007$) were significantly adopted during the COVID-19 pandemic. No significant results were observed for any of the teaching tools prior to the COVID-19 pandemic by academics on either continent.

Other tools adopted on both continents to support their online teaching included MS Whiteboard, Kahoot, Padlet, Mentimeter, Slido, Thinglink, Dropbox, Polling and YouTube private videos.

In order to assess if there is a relationship between the type of institution (public or private) and the usage of these teaching tools, Pearson's Chi-square test was used. Results showed

that in Australia and Africa a significant number of private institutions used Moodle for teaching prior to and during the COVID-19 pandemic, p<.0005 in both cases.

5.4 Communication with, and support for, students during online teaching

The study then proceeded to understand how academics were communicating with students during the move to online teaching

From Figure 4 below, it is noted that African academics perceived that technological factors were the major challenges that students faced – "access to connectivity" (88.5%), "access to devices" (71.9%), and "technology competence" (46.0%). This was followed by the social and emotional factors – "lack of interaction" (52.5%), "fear of the unknown" (41.4%), and "demotivation" (32.4%). In Australia, after "access to connectivity" (57.7%), the Australian academics highlighted that they perceived the major challenges their students faced were the social and emotional factors – "lack of interaction" (56.3%), "demotivation" (38%), and "fear of the unknown" (35.2%). This was followed by technological factors – "access to devices" (33.8%), "technology competence" (33.8%) and "resistance to change" (23.9%).

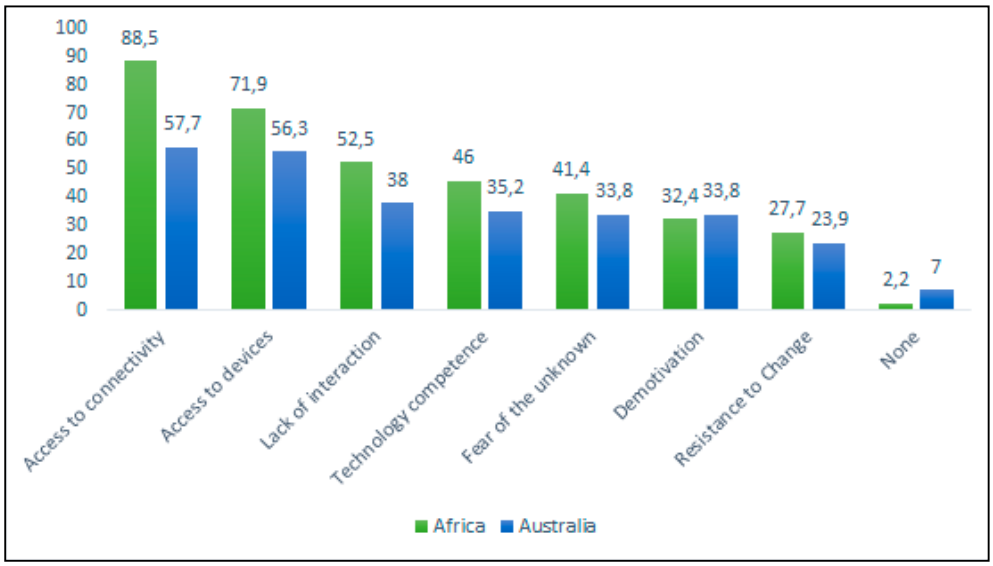


Figure 4: Comparison of academic perceptions of challenges faced by students in moving online

Further statistical analysis through a binomial test showed that a significant number of respondents indicated that African students faced the hurdles of access to connectivity (88%, p<.0005) as well as access to devices (72%, p<.0005). In Australia, a significant proportion of the respondents did not select these hurdles.

The methods that were adopted by academics to support their students during the COVID-19 pandemic are compared in Figure 5 below.

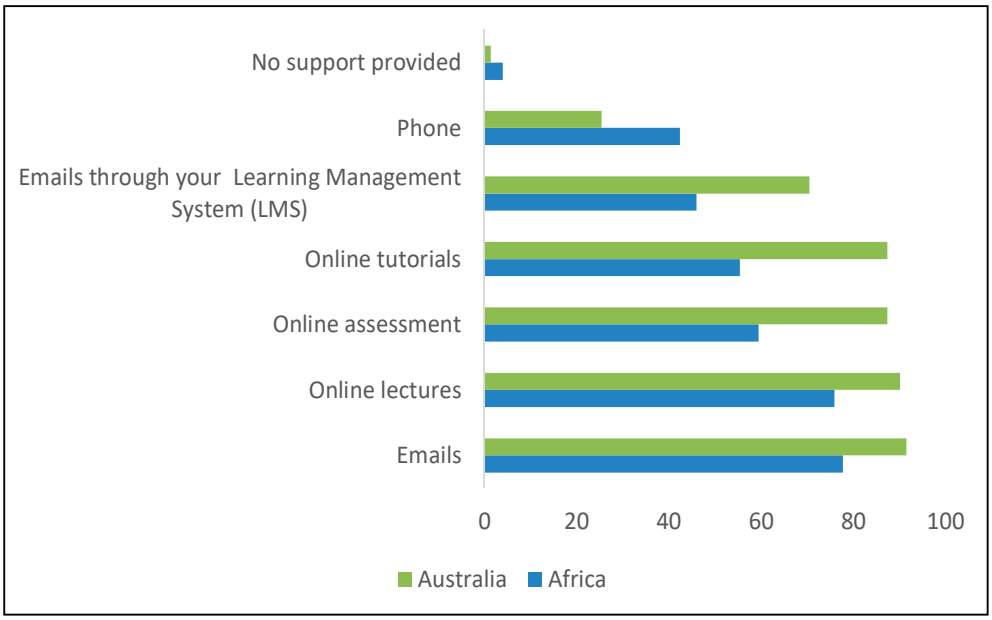


Figure 5: Comparison of methods to support students during the COVID-19 pandemic

In Africa, online lectures (76%, p<.0005), online assessment (58%, p=.002) and emails (78%, p<.0005) were all indicated by a significant proportion of the respondents as ways they supported their students. In Australia, online lectures (92%, p<.0005), direct emails (90%, p<.0005), online tutorials (87%, p<.0005), online assessment (87%, p<.0005) and emails through LMS (70%, p<.0005) were the methods adopted to support students.

When academics were asked to rate the students' responsiveness to the support on a scale from 1 (unresponsive) to 5 (very responsive), the mean rating was 3.83 (Africa) and 3.32 (Australia) which is significantly higher than the central score of "3" (p<.0005), indicating that academics on both continents believed that their students were more responsive than average. In the same way, the mean rating of the effectiveness of African academics working with their students online, when using a scale of 1 (not at all effective) to 5 (very effective), was 3.04 (Africa) and 3.65 (Australia), which is also significantly higher than the average score of "3", indicating a better than average effectiveness, p<.0005.

There was a significant indication (mean = 3.22, p =.35) that African academics would continue with online learning post the COVID-19 pandemic, while there was no significant indication that Australian academics would continue with online learning post the COVID-19 pandemic.

5.5 Experiences with the shift to a forced "work-from-home" situation

The next section of the study investigated the infrastructure and resource support pillars of the Khan framework, with particular emphasis on the "forced" work-from-home arrangements adopted during the COVID-19 pandemic.

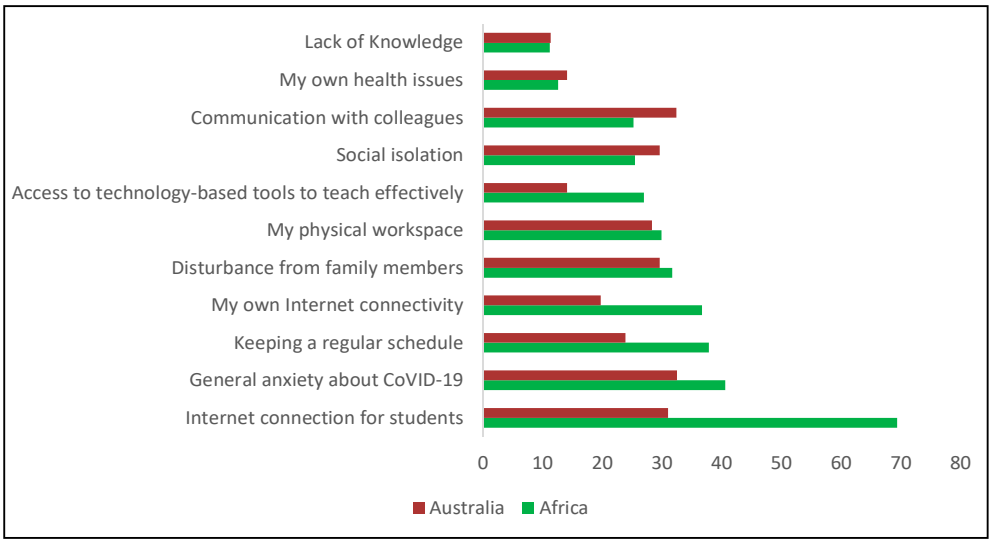
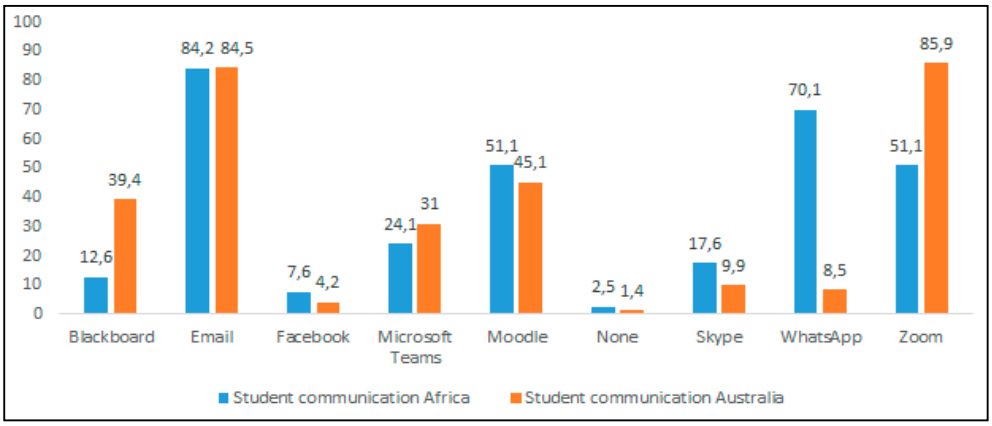


Figure 6: Comparing the challenges faced in the "forced" work-from-home arrangements

The predominant challenges faced by African academics in the "forced" work-from-home arrangements during the COVID-19 pandemic were "internet connection for students" (69.4%), "general anxiety about COVID-19" (40.6%), "keeping a regular schedule" (37.8%), "my own internet connectivity" (36,7%) and "disturbance from family members" (31.7%), as presented in Figure 6 above. Likewise, the predominant challenges faced by Australian academics in the "forced" work-from-home arrangements during the COVID-19 pandemic were "general anxiety about COVID-19" (32.4%), "communication with colleagues" (32.4%), "internet connection for students" (31.0%), "social isolation" (29.6%) and "disturbance from family members" (29.6%).

The results of a binomial test indicated that a significant proportion of African academics experienced the challenge of "internet connection for students" (69.4%, $p<.0005$). In Australia, a significant proportion of the respondents did not indicate any of these challenges.

The type of work-from-home (WFH) arrangements that academics adopted for communicating with students and colleagues during the COVID-19 pandemic are summarised in Figure 7 below.



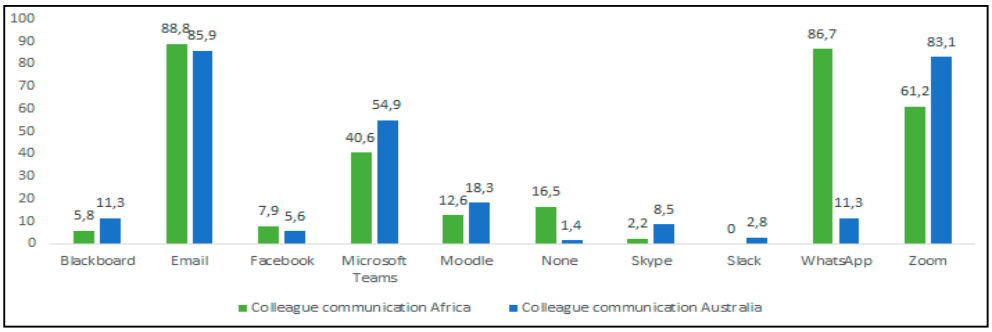


Figure 7: Comparison of the WFH communication methods adopted

The results of a binomial test indicated that in Africa, email (84%) and WhatsApp (79%) were significantly adopted for communication with students, p<.0005, while Zoom (61%), email (89%) and WhatsApp (87%) were significantly adopted for communication with colleagues, p<.0005. In Australia, student communication tools were Zoom (85.9%), email (84.5%), LMS (Moodle) (45.1%), LMS (Blackboard) (39.4%) and Microsoft Teams (31%). For colleagues, email (85.9%) was the most predominant, followed by Zoom (83.1%), Microsoft Teams (54.9%), Moodle (18.3%) and Blackboard (11.3%). Colleagues and students used Zoom and email the most for communication purposes (p<.0005 in each case).

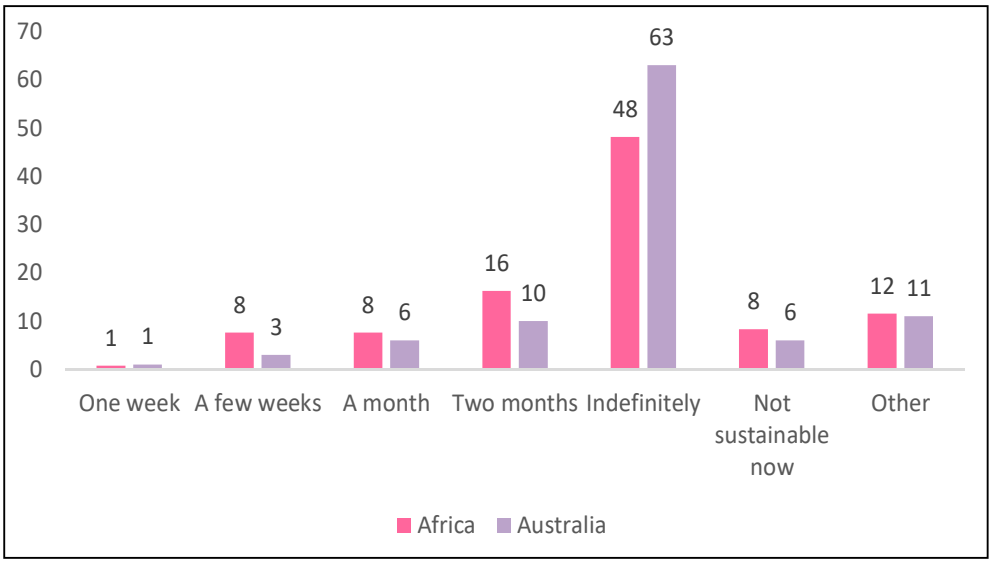


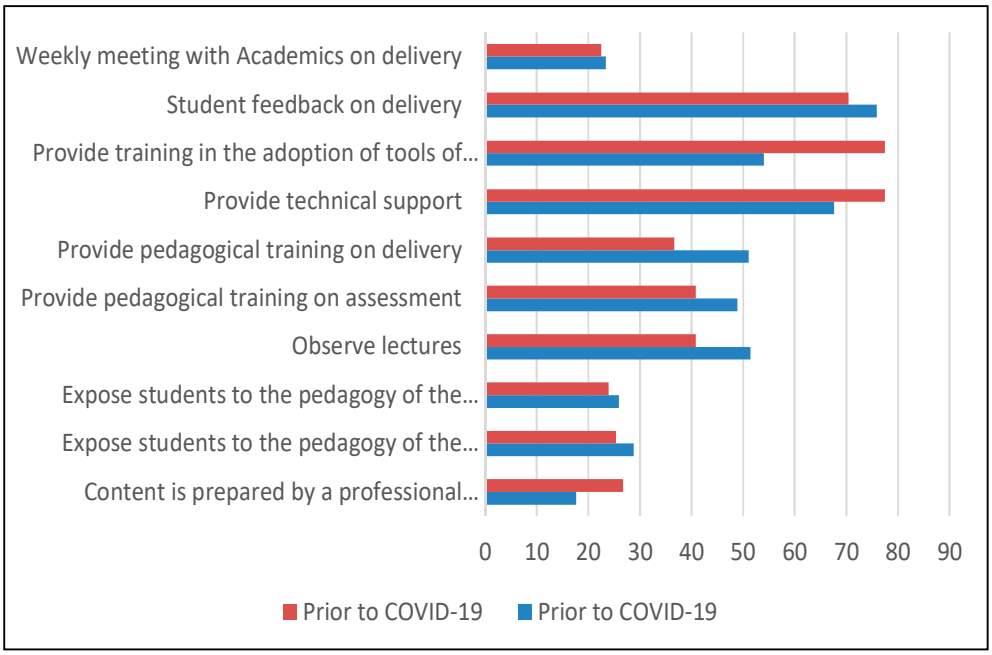
Figure 8: Comparing the duration that respondents could sustain their current WFH arrangements

Results from a chi-square goodness of fit test showed that in Africa, a significant number of respondents (n=134, 48.2%) are able to sustain their current WFH arrangements indefinitely, also a significant number of respondents (n=45, 16.2%) are able to sustain their current WFH arrangements for two months, as illustrated in Figure 8. In Australia, a significant number of respondents (n=45, 63%) are able to sustain their current WFH arrangements indefinitely. While the above section of the study focused on the infrastructure, resource support pillars of the Khan Framework (Khan *et al*., 2021), the responses also alluded to aspects that need to be addressed in the technology pillar.

5.6 Quality assurance during online teaching and assessment

The investigation of the ethics pillar was conducted in the third section of this study, which particularly focused on the quality assurance (QA) procedures that were adopted by HEIs prior to and during the COVID-19 pandemic.

These are summarised in Figure 9. African academics identified the following QA procedures as being adopted more frequently prior to the COVID-19 pandemic – "student feedback on delivery" (75.9%), "provide technical support" (67.6%), "provide training in the adoption of tools of LMS" (54.0%), "observe lectures" (51.4%) and "provide pedagogical training on delivery" (51.1%). During the COVID-19 pandemic the QA procedures shifted to "provide training in the adoption of tools of LMS" (73.4%), "provide technical support" (69.4%), "provide pedagogical training on assessment" (50.0%), "student feedback on delivery" (47.5%), "provide pedagogical training on delivery" (45.0%). In Australia, the same top three QA procedures were used by a significant proportion of the respondents prior to and during the COVID-19 pandemic. These included "provide training in the adoption of tools of LMS", "student feedback on delivery" and "provide technical support".



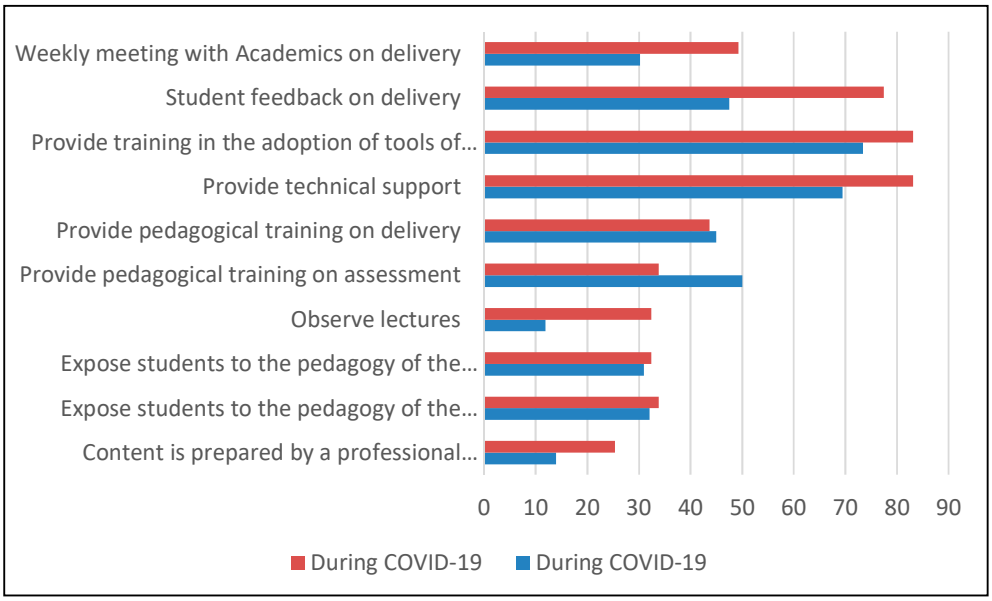


Figure 9: Comparison of institutional quality assurance procedures

While the above section of the study focused on the ethics pillar of the Khan framework, the responses also alluded to aspects in the infrastructure, resource support, technology and pedagogy pillars that need to be addressed.

5.7 Perceptions on the future shape of HEIs

The chi-square analysis showed that a significant number of respondents in Africa and Australia (n=209, 75%: Africa), (n=45, 63%: Australia) perceive that their institution will adopt blended learning post the COVID-19 pandemic, as shown in Figure 10 below.

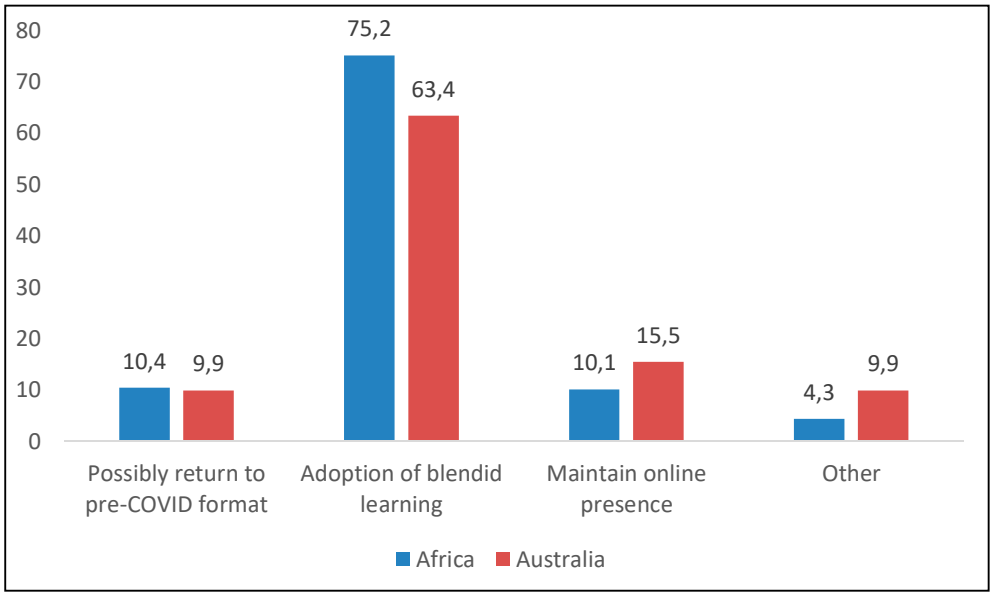


Figure 10: Comparing perceptions of the future shape of the institution

6. Discussion

The study looks at academic's online preparedness for teaching and learning during the COVID-19 pandemic. The study pivots around the quality assurance framework, Khan's (2001) framework, looking at infrastructure, resource support, technology and pedagogy. These domains are critical for effective online delivery. The study shows similarity and differences with differing preparedness of higher institutions on two different continents.

Africa has numerous challenges, but it is apparent from the results that both continents used a number of digital tools to enhance teaching and learning during the COVID-19 pandemic. The difference was the predominant tool used. In Australia there was a greater dependence on Zoom whereas in Africa it was Moodle. Turnbull et al., (2021) identify two key technology tools that are described as in real time or synchronous (such as using Zoom) and asynchronous learning where the learning can be done in one's own time though the LMS or other means. The difference noted here is understandable due to cost factors. In the African context, there was a large dependence on WhatsApp for teaching (Singh, 2021) which reflects research that a limiting factor in delivering digital teaching and learning is the availability and capability of internet infrastructure (Beaunoyer *et al*., 2020). There is no one size fits all for online learning (Pokhrel & Chhetri, 2021).

The results further reveal that although there was a rapid change from face-to-face or blended learning to a totally online teaching environment, teaching staff in both the developing

and developed regions were confident in their proficiency in using the necessary digital tools to deliver their classes whether it was teaching or in assessments. This suggests that teaching staff were utilising such features prior to the COVID-19 pandemic and the move to a fully online platform was not too difficult. Contrasting this finding was the learning difficulties faced mainly by African students, especially in terms of Wi-Fi connectivity and access to relevant devices such as computers and internet tools. In addition, African students had a challenging time in terms of their technological competence. However, in Australia students also had difficulties with connectivity and this could be due to the higher level of usage which is costly, and most students have limited budgets. In developing regions, accessibility of internet bandwidth and affordability are real concerns that require higher-level policy (Pokhrel & Chhetri, 2021) and reform structures to meet the ongoing needs for sustained ongoing remote education throughout a COVID-19 pandemic that continues to cause disruption almost two years since its initial outbreak.

One significant difference between Australian and African students was that in Africa the mental health of students, especially the lack of social interaction is of great concern. Mthetwa (2021) stated that online learning in the African HE context had an adverse effect on the mental health of students, in particular, that the journey had been a lonely one. In one study in Australia, in the first period of COVID-19, the levels of clinically significant symptoms of depression and anxiety among adults were reported suggesting a widespread change in the mental health of the Australian adult population (Fisher *et al.,* 2020).

Academics on both continents had general concerns about COVID-19 when working at home, and reported that there was a tendency for family matters to come in between work. One factor that seems to distinguish between academics was that in Australia there was greater concern about social isolation, and in particular communication with fellow colleagues.

The investigation of the ethics pillar in this study on the quality assurance (QA) procedures that were adopted by HEIs prior to and during the COVID-19 pandemic suggest that higher education providers had ensured the quality of delivery was maintained to ensure quality of programmes. The commonality of the top three QA processes of providing technical support, pedagogical training in the tools of the learning management tools and student feedback, demonstrates that higher education providers were on the same page to ensure quality of programmes.

7. Conclusion

The study provides a perspective of two vastly different geographic locations in terms of the preparedness of teaching and learning in the COVID-19 pandemic. Although there were similarities, the differences were clearly in delivery limitations faced in developing regions in terms of access to the necessary tools for the learners to achieve the best advantages of digital delivery. The study also suggests that in developing regions the move to rapid digital delivery also highlighted concerns of accessibility to digital tools for students, although staff were dedicated to ensuring that delivery progressed as effectively as possible.

The findings in this study have a number of implications for higher education and fall into three broad areas: policy, teaching and learning and capacity building. Policy wise, the study provides global confidence that higher education providers have maintained quality assurance processes as they moved and sustained digital delivery in the COVID-19 pandemic environment. The case studies in this paper from both continents –Africa and

Australia – have seen strong policy development and workshops in key pedagogical areas to ensure sustained delivery for their online programmes. Examples of policies include the Engaged Digital Delivery policy and procedure that was utilised for example in the Victorian Institute of Technology (Australia), and workshops on using various tools and enhancing engagement in the digital world. Secondly, in teaching and learning, the study suggests the readiness of academics in the higher education sector to adapt a different delivery mode to ensure their main stakeholders, the students, have been able to complete their studies during a time of upheaval.

Thirdly, an important implication in this study is that whether teaching and learning is delivered in a developed or developing nation, the key to any readiness of the academic workforce lies in the ability of institutions as a whole to ensure their staff are trained. This study provides support that capacity building prior to and during the COVID-19 pandemic was the critical element that ensured teaching and learning took place effectively.

Finally, an important contribution this study makes is the need for higher education to plan strategically for the future of their stakeholders through effective leadership. The results suggest that infrastructure, resource support, technology and pedagogy are key elements in ensuring quality delivery as espoused by Khan's (2001) framework. A possible route to ensure the planning is effective could be a dedicated committee that analyses and recommends future needs of the institution to address possible scenarios to the leadership for effective digital delivery. Clearly such risk assessments are built in the operating model of any institution, but the COVID-19 pandemic has shown that these steps were not sufficiently in place for many institutions for such drastic changes. An example of this lack of readiness that has been shown in this current study is the need to ensure there is appropriate and applicable infrastructure to support such eventful and ongoing changes in the teaching and learning space. Digital learning and teaching are here for the long haul and such changes observed over the last 18 months suggest that the academics of the future must be digitally ready to deliver effective programmes that are pedagogically sound, engage students through remote learning experiences and with the right infrastructure to service the new education environment.

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