The Digital Divide: Teaching and Learning at the University of KwaZulu-Natal during the Covid-19 Pandemic

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ABSTRACT

The Covid-19 pandemic affected all facets of life around the globe. Institutions of higher learning have not been immune to the pandemic, risking the interruption of the academic year. In a bid to save the academic year, institutions have been forced to look at how teaching and learning can take place without compromising their academic credibility and quality of instruction. Digital teaching and learning can be seen as a way of surmounting the restrictions placed on accessing education for full-time students, especially amongst those originating from low-income households and living a distance away from the university. In the more developed parts of the world, access to Information and Communication Technology (ICT) is much more advanced although there are some variations in the levels of access. Notwithstanding, it is much more accessible as compared to their counterparts in developing countries. This digital divide places universities in a precarious position in developing countries.

This paper examines how ICT can be used effectively to facilitate teaching and learning in these uncertain times. It focuses on how South African universities moved to embrace ICT resources post-liberation and the creative use of this to advance their teaching and learning within their institutions. However, within the country there is a digital divide between historically advantaged white universities and the Black disadvantaged ones due to the legacy of colonialism and Apartheid. The University of KwaZulu-Natal is used as a case to illustrate how, despite the traumatic experience of a merger between two disparate universities (the University of Natal, comprising predominantly whites, and the University of Durban – Westville, which was historically established for Black students), the university seized the opportunity for ICT development within its teaching and learning programmes. This paper examines how this merged institution braced itself over the years to invest in ICT infrastructure and resources, which it used for emergency teaching and learning during the Covid-19 pandemic.

KEYWORDS

Introduction

The COVID-19 pandemic that gripped the globe required millions of learners and institutions to adjust their teaching and learning programmes or risk the serious interruption of the 2020 academic year. Such a disruption would mean that an entire generation of the global population would have a setback of a year (or perhaps more) of productivity in various socio-economic and political spheres of life. The inability of institutions of higher learning to reproduce skilled labour to meet future market demands can have far-reaching consequences, especially in the absence of certainty on when the pandemic will abate.

Given the inequality between developed and developing countries, the response to the pandemic within tertiary institutions will vary in respect to using teaching and learning technology as a tool to reduce the impact of the pandemic on educational throughput. Developed countries with better educational resources are likely to be in an advantageous position to manage the impact of the pandemic and provide a safety net on ensuring the academic program continues uninterrupted as compared to their less developed counterparts. Less developed countries have many infrastructure deficits to provide a conducive technological environment for advancement to the world of digitisation to support the most contemporary teaching and learning tools.

Globalisation and rapid digital advancement requires developing countries to keep pace with the information network in order for it to advance their country's social, political and economic interests. Therefore, developing countries need to invest in Higher Education Institutions' (HDIs) human capital through transition to digital tools to promote teaching and learning that is globally and locally competitive, cost effective and accessible. Given the poor state of the economy in developing countries, investment in information and communication technology (ICT) as an emergency measure during the COVID-19 pandemic becomes precarious.

In the South African context, post-democracy, institutions of higher learning came under pressure to make the transition from traditional forms of teaching and learning to ICT-driven ones. Various policy documents informed this transition to ICT-driven teaching and learning modes. Whilst such a move in institutions of higher learning is lauded by educational policy makers, concern has been expressed by the academic fraternity, especially those originating from a disadvantaged history on whether all South African universities could afford this transition given the wide gap between historically advantaged universities under Apartheid and those that have been disadvantaged.

This paper examines the integration of ICT in teaching and learning globally, and how it responds to student-centred learning. Thereafter the digital divide in ICT modes of learning between developed and developing countries is presented. This is followed by a discussion on digitisation of teaching and learning in South African Higher Education Institutions (HDIs). Finally, the paper examines how the transition to ICT teaching and learning at the University of KwaZulu-Natal is used to rescue the academic year from the consequences of the COVID-19 pandemic, which is plaguing the world.

Integration of Information and Communication Technology (ICT) in Teaching and Learning

Information and Communication Technology has been part of human development since the 1840s through the advent of the telegraph and the telephone leading to present day global electro-magnetic communication systems. ICT can be said to be a precursor to globalization which has made the world inter-connected. The move to ICT in different spheres of life has been around before the Covid-19 pandemic.

With globalisation, digital technologies have become major drivers in the socio-political and economic spheres of society which needs to be considered when transitioning to ICT development.

The reorganisation of social and economic relations, interdependencies and interconnectedness within and between nation states has become a powerful force that demands advancement and adaptation to the changing nature of the world. This requires meeting the demands for transformation within the ICT sector or risk the consequence of being under-developed. In the 21st Century, digital literacy (DL) has become essential in order to advance in the different sectors of society. As a corollary to this, globalisation would need digital technologies that facilitate universally accessible, reliable and inexpensive communication (Njenga, 2018:1).

To address the demands made by globalisation, educational institutions are called upon to prepare students to face the challenges and opportunities of a global workforce. Researchers and stakeholders alike argue that at all levels of education, the future success of young people and university graduates depends on being technologically competent in order to use a variety of technological tools and being globally competent in order to work with diverse and geographically dispersed people and act on globally significant issues (Kopish and Marques, 2020:45).

In the field of higher education, the introduction of ICTs in the form of eLearning has transformed the teaching and learning experience as compared to traditional forms. Such a transition is influenced by several pedagogical factors. Sife et al (2007:57) assert that eLearning provides greater information access; greater communication via electronic facilities; structured learning time; increased cooperation and collaboration, cost-effectiveness for educational institutions (e.g. by reaching different students and in greater numbers) and pedagogical improvement through simulations, virtual experiences, and graphic representations. In this respect, teachers and learners can choose more appropriate applications,

which are flexible in time, in place, personalized, reusable, and adapted to specific domains and more cost-efficient (Sife et al 2007:57).

There is an intergenerational gap in the use and application of ICT. The current generation of ICT users may be dubbed the Net, Cyber Generation or Information society. This is because students today enter higher education with a wide range of digital technologies, which did not exist previously. Even though they do exist, not all have developed skills to use the technology effectively.

The transition and adaptation to a new range of ICT provides them with an advantage of being technically proficient using a range of technological platforms in their learning journey. Compared to traditional forms of teaching and learning, the current generation do things differently. It is in this context that higher education practices need to transform to meet the needs and competencies of these new cohorts of students and those to follow in the future. Hence, the learning environments should accommodate by providing a conducive environment for these 'more technology-driven, spontaneous, and multi-sensory' learners (Brown and Czerniewicz, 2010:357-358). Even though today's students are users of ICT, it may be argued that they are not necessarily producers of digital content and as such they are not all that different from previous generations.

ICT Teaching and Learning in Developing Countries – The Digital Divide

Unlike in their less developed counterparts in developed countries, ICTs have a long history and, over time, expanded in all facets of life. Given the disparity in the distribution of ICT resources around the globe, the concept digital divide gained currency in the 1990s amongst different stakeholders such as scholars, policy makers and advocacy groups. The concept is used to describe the growing gap, or social exclusion, between those who have access to the new services of the information society, and those who do not. Yet for millions of people in the world's poorest countries, there remains a "digital divide" excluding them from the benefits of ICTs (Saheb, 2005). Women, children and youth, the aged and those living in rural environments were ICT infrastructure is either non-existent or poorly developed, are confined to the margins of digital technology.

The reason for underdeveloped ICTs in developing countries may be attributed to a number of factors. Lack of access to education or training, fiscal constraint to buy required equipment, problems obtaining the required communications links or services to get online, are some of the challenges. Accessing the Internet with efficiency requires the quality of connection and support services, processing speed and other capabilities of the computer to be of a standard that is globally competitive. Unlike the developed nations, developing ones do not have the necessary resources to invest in and develop ICT Infrastructure to reap the enormous benefits that participation in the information age brings. Developing countries are trailing at a much slower pace compared to their developed counterparts. These trends are due to the many socio-economic and

political challenges faced by governments, political leaders, and business entrepreneurs in developing countries (Saheb, 2005) which militates against any benefits that may be derived from national development through ICT use in development programmes and projects.

Ponelis and Holmner (2015:164) assert that the skills for the knowledge economy are built at institutions of higher learning. At these institutions, education ensures that sufficient skills are imparted to learners so that they may become active participants in the economy and make a meaningful contribution to society. Ponelis and Holmner (2015:164) note that the tertiary student population in Africa tripled from 2.7 million in 1991 to 9.3 million in 2006. Additionally, in sub-Saharan Africa (SSA), post-secondary education has grown faster than in any other region with fewer than 200,000 students enrolled in SSA universities in 1970, a number which rose to over five million in 2010 and has been increasing by 10–15% annually since then. It was projected that the entire continent would have between 18 million and 20 million students by 2015. Despite the rapid growth in the student population at institutions of higher learning only 6% of this age cohort were enrolled in 2008, compared to the global average of 26%. Furthermore, only 11% of African university students are studying subjects with potentially high employability (Ponelis and Holmner, 2015:164). These trends suggest that student absorption rate at institutions of higher learning is precarious in developing countries due to financial exclusion as a result of a variety of poverty related issues. Lack of physical infrastructure, skills, political instability, unemployment, pandemics, corruption,

single parents, and child headed households exacerbates the effects of poverty in the African continent. Taking for example Ethiopia with 65 million people is the second largest population in Africa; it has no electricity, which is a key component for access to ICT resources. On the other hand, South Africa being the most technologically advanced country in the continent has been experiencing intermittent power cuts, which has implications for the efficiency with which ICT programmes and platforms are used (Tamrat and Teferra, 2020). Notwithstanding persistent poverty levels and infrastructure deficits, those that are successful in securing access to education at institutions of higher learning are challenged by the lack of ICT infrastructure in these institutions. Across the continent ICT infrastructure has been restricted due to the lack of investment, policies and systems that promote its growth and usage. In institutions of higher learning, access to ICT resources cannot be implemented and used if the African continent does not have infrastructure to support it so that students could sufficiently develop digital competencies. Sife et al (2007:57) asserts that African universities, which should be in the forefront of ensuring Africa's participation in the ICT revolution, are themselves unable and ill-prepared to play such a leadership role in the continent due to the information infrastructure of African universities being poorly developed and inequitably distributed.

Developing countries, even though they are in a position to advance in teaching through ICT tools, are also constrained to pay for software licenses and copyright fees. The cost of these licenses is prohibitively expensive and as such, universities cannot

sustain paying for them. The software tends to be produced in developed countries and by the time developing countries have access to it and master the technology behind it, new versions of the software are produced to replace the old. Similarly, online books, journals, periodicals, data bases and the like, unless there is open access, pose a major constraint to bridge the digital divide between developed and developing nation states.

Digitisation of Teaching and Learning in South African Higher Education Institutions

The educational landscape in South Africa has a long and painful history since colonialism and later Apartheid spanning over 350 years. During colonialism, many missionary schools were established on the assumption that the majority of disenfranchised Blacks were barbarians that needed to be civilised through mission school education with a Christian ethos. At a community level, the very wealthy also established schools, aided by the state. However, during apartheid racialized educational institutions were established by the government based on one's racial background. Institutions of higher learning were not spared racialized forms of learning. Separate institutions of higher learning were established by the Apartheid government for Whites, Coloureds, Indians and indigenous Africans. Black institutions of higher learning were under-resourced with deficits in infrastructure, skills and teaching and learning tools. Given the appalling state of Black higher education in the country, the Freedom Charter (1956) which was the mandate for political change for the ANC gave due recognition to the importance of education. The Freedom

Charter gave precedence for the liberation movement to "open the doors of learning for all".

Upon South Africa's liberation in 1994, transformation of the higher education landscape received priority attention to bridge the gap between historically disadvantaged institutions (HDIs) and those that were historically for white learners and academics. Letseka et al. (2018:125) observe that African people constitute about 80.8% of the country's total population while whites constitute a meagre 8.8%, yet whites constitute over 80% of the university professoriate. With disparity in government funding and underdevelopment in these HDI's, attention focused on transforming the sector so that it becomes equitable, competitive and meeting the labour demands of the country.

Post-apartheid, the African National Congress (ANC) led government inherited many socio-economic and political challenges to surmount from Apartheid's legacy. In as far as the education sector was concerned, the government expressed a strong commitment to the use of ICTs in education so that it could produce a skilled labour force to support its post-apartheid Reconstruction and Development Programme (RDP) (Department of Education, 2004:13). Former President Thabo Mbeki announced that if South Africans are to participate in the knowledge economy, every effort must be made to prevent social exclusion. He underscored the importance of ICTs for social and economic development at numerous South African and international fora. He noted: "We must continue the fight for liberation against poverty, against under-development, against marginalisation" and "…information and communication technology … is a critically important tool

in that struggle" (Department of Education, 2004:10).

A number of policy documents were formulated to support ICT advancement in higher education. The role of ICTs in education is evident in South African national and institutional policy documents such as The National Plan for Higher Education (Department of Education 2001), The National Research and Development Strategy (Department of Science and Technology, 2002a), the National Research and Technology Foresight ICT Report (Department of Science and Technology, 2002b), and the White Paper on e-Education informed the policy direction for ICT development in the education sector (Department of Education, 2003). These policy documents argue that using ICTs will variously add value to education, improve teaching and learning, encourage innovation and contribute to transformation (Czerniewicz and Brown, 2005:2).

Like most parts of the world, the South African education and training system had to respond to the pressures and challenges posed by the information revolution-taking place in the globe (Department of Education, 2004:13). Since the ICT policy came into place, South African higher education institutions expended large sums of resources on infrastructure, tools, skills and software to maintain a competitive edge on knowledge production, exchange and collaboration in the global academy and the region despite ever-increasing resource constraints. South Africa's status as a middle economy country with its very wide wealth disparities means that the university combines its access to sophisticated technology with a need to address very serious issues of social and economic disadvantage (Gray, 2007:35).

Rescue of Teaching and Learning during the COVID-19 Pandemic at the University of KwaZulu-Natal

The University of KwaZulu-Natal was born out of a merger in 2004 with the Historically Advantaged (HA) white university (Natal) and the Indian university (Durban-Westville) which fell into the category of Historically Disadvantaged (HD) universities in the country. Merging of the two universities was motivated by the need to address the historical inequities in higher education, consolidation of resources, rationalisation and to promote African scholarship. It branded itself to be the institution of choice for African scholarship. Since the merger, the University of KwaZulu-Natal (UKZN) (despite historic differences in organisational culture and diversity in the two institutions) made major strides investing in its ICT infrastructure based on the various policy documents alluded to earlier.

Post-merger, the UKZN rationalised its organisational structure by setting up colleges over five campuses. These colleges comprise the humanities, agriculture, engineering and science, health sciences and law and management studies. Below these colleges are schools comprising a host of programmes. Concerns were raised by the unions and staff about the College organisational structure, its efficacy and costs involved and whether this model was suited for an African context. Notwithstanding such concerns, the College model was implemented by the management of the institution in order for it to be globally competitive.

Since the merger, the university made great strides in upgrading ICT infrastructure. Audio-visual technology was installed in teaching venues inter alia, data projectors, high definition document cameras, motorised screens, cabling, and installation of wireless access points. Infrastructure for charging technological tools and creating more learning spaces for wireless facilities

were created (UKZN 2016 Teaching and Learning Report 2014-2015: 95). Academic software was upgraded to the most contemporary versions available in developed countries and these were made easily accessible to staff and students. Staff were provided with laptops so that they could teach effectively in lecture venues and have the flexibility to work from home. The success of digital teaching and learning was fully realised in 2015 when 1087 modules were uploaded on Moodle and 36,089 students were accessing the platform (UKZN 2016 Teaching and Learning Report 2014-2015: 93). Moodle served as a learning platform that provided academics, administrators and learners with a personalized learning environment.

The rapid transition to digital learning has earned UKZN an international reputation for academic excellence, outstanding research output and African scholarship. For the 2018-2019 academic year, the Center for World University Rankings (CWUR) ranked UKZN 402 internationally and nationally third as compared to other historically advantaged universities, which have not merged and have not transformed their institutions fully in keeping with the enormous diversity that exists in the academic community.

Given the technological advancement made by UKZN since the merger, the university has created a variety of options for teaching and learning on its campuses. The COVID-19 pandemic in a way placed direct pressure on the institution to test out whether its eLearning system can cushion the negative impact of the pandemic on both students and academics. In this respect, the institution put in place a Teaching and Learning Project Plan during the COVID-19-related restrictions. The plan focused on ways in which the academic year could be saved, despite the uncertainty of the pandemic by identifying challenges that both students and academics face in

adapting to digital learning and overcoming gaps. The project plan examined the implications of digital learning, student training strategies, online teaching strategy, and access to teaching platforms by international and students with disabilities (Songca, 2020).

In implementing the project plan, financially disadvantaged students who qualified for the National Financial Aid Schemes (NSFAS) were supported with digital resources for the learning process to continue. Logistical challenges in acquiring laptops and digital/hardcopy materials to students who are distributed across the province and beyond, data costs of streaming/ downloading content at home, lack of and quality of network coverage across the province and beyond, computer literacy issues, mainly amongst first-year students and lastly student orientation on Moodle and other virtual platforms utilised are some of the challenges that needed to be considered when implementing the teaching and learning project plan (Songca, 2020:2).

As far as academic staff were concerned, the project plan aimed at improving capacity in terms of using ICT tools for curation of online materials. Pedagogical approaches to teaching and learning needed to be adapted for online teaching and learning. This included teaching and learning courses for staff. It was recognised by the project management team that data restrictions due to the unaffordability and unavailability amongst deserving students curtailed the uploading of materials from home. Faculty needed support for curation, editing and uploading of videos. The project management team noted that modes of delivery in certain modules and programmes did not lend themselves easily to online delivery as practical teaching and learning requires face-to-face contact in laboratories. Last, work experience and in-service training requirements to use online

teaching and learning need to be explored (Songca, 2020:3).

At a meeting of Universities South Africa (2020) comprising Vice Chancellors from all state funded institutions there was wide recognition that respective institutions use ICT as an emergency measure for teaching and learning if the academic year was to be saved in the context of the pandemic. In order to test the readiness of online teaching and learning a dry run needed to be undertaken. UKZN made strides in finalising its negotiations with MTN, Vodacom and Telkom for zero-rated access to 11 University sites including Moodle. Arrangements were made to run the learning content via a proxy server on campus for the telecommunications providers as part of getting the University ready for online learning. Other logistical options were also explored to ensure that no students were left out due to lack of access to online services. For instance, home addresses of all registered students were geo-mapped to establish their location and to get a sense of how many students were located in areas with poor internet coverage. The possibility of providing 'Wi-Fi hot-spots' for these students was explored. Meanwhile, students were encouraged to engage in self-directed learning to keep ahead in their studies, while academics were being urged to continue preparing for the dry run and launch of the new system by uploading learning materials and curating content (Universities South Africa 2020).

It would appear that UKZN has taken great measures to ensure digital infrastructure, teaching and learning platforms to be in place. Other ICT logistical issues to further the teaching and learning programme were attended to while logistical arrangements were put in place to continue with the academic programme. A phased access of students to the university was planned and the first cohort of students to be allowed on university premises was scheduled for 29 June 2020. Since the return of students, with dedicated ICT support the online teaching platform with some glitches concluded the first semester of the academic year.

Although most institutions in the country were in a position to complete the first semester through online teaching and learning, upon reflection the Department of Higher Education claimed that the online learning during the pandemic was a "success". This assertion has been highly contested by the South African academic fraternity and in response a petition is circulating refuting the claims made by the Department of Education. The petition contests amongst other things that "closing campuses may have been necessary to fight the pandemic, but in the rush to online teaching we lost important face-to-face engagement with our students. Even as our classes are often too big to have the kind of classroom interactions we would like to have with our students, the loss of discussion in lecture rooms, after classes, in offices and on campuses, reduced the quality of university education dramatically. Much of what students learn at university does not come from lecture content, but from ongoing interactions with lecturers and tutors, in seminars and workshops, and with the many different people and settings that shape campus life".

Conclusion

The COVID-19 pandemic has changed the way in which teaching and learning take place in institutions of higher learning. Considering that, no one really knows when life will return to normal and given the second wave of the pandemic being amidst us, when universities will open to continue with the academic programme, is a grey area. The paper highlights the enormous benefit that can be derived from the transition to ICT teaching and learning. Although this could be an emergency response to teaching and learning, one

needs to be mindful of the pedagogical implications of teaching "through" versus "with" technology. Teaching "through" technology now would appear as a safety measure against social distancing, as learners will have very little contact with the teaching fraternity. Teaching "with" technology using blended methods would be an ideal, but under the circumstance, one has to settle for the lesser.

The digital divide between developed and developing countries in many instances is wide. Bridging this gap during the COVID-19 pandemic is unlikely to feature, as developing countries do not have the infrastructure to transition to ICT teaching and learning. The challenges have different dimensions, including structural, economic, social and technical issues. In the case of South Africa, there is also the divide between historically advantaged and disadvantaged institutions given the legacy of colonialism and later Apartheid. Historically advantaged institutions are better able to transition to ICT-driven teaching and learning modalities. UKZN is a merger project between the former University of Natal, which catered to whites whilst the University of Durban-Westville was historically disadvantaged and catered to the needs of Indian students. Despite merger challenges, UKZN responded proactively to the government's policy call

to upgrade ICT infrastructure over time. In the COVID-19 period UKZN has devised a project plan for online teaching and learning, which commenced on 29 June 2020 in different phases, whilst more advantaged institutions in the country have already concluded their first online semester in the academic year.

This paper has been written at a time when the pandemic was unfolding and captures the emergency response by institutions of higher learning to save the academic year. With the second wave of the pandemic making its round in the globe, South African institutions of higher learning once again have to brace themselves to continue with online teaching and learning.

Although, a dissenting voice is emerging within the academic fraternity on some of the downsides to online teaching and learning, it need be noted that this arrangement was in the context of the world response to the COVID-19 pandemic. Under normal conditions, perhaps a more positive attitude will emerge on the benefits of online teaching and learning. As alluded to earlier a blended learning environment combining both traditional and e-Learning approaches could have sound pedagogical outcomes.

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