EDITORIAL

INTEGRATING FUNDAMENTAL DIGITAL-TECHNOLOGY SOLUTIONS IN AFRICA'S HIGHER EDUCATION PRACTICES AND THEORIES FOR SUSTAINABILITY

A. Bayaga
Senior Secondary Education
Nelson Mandela University
Gqeberha, South Africa
https://orcid.org/0000-0002-3920-8568

S. B. Khoza
Education Studies Cluster: Curriculum Studies & Educational Technology
University of KwaZulu-Natal
Durban, South Africa
http://orcid.org/0000-0002-7153-2990

The current special issue in South African Journal of Higher Education explored the integration of fundamental digital-technology (augmented or assistive technologies) solutions in Africa's higher education practices and theories for sustainability. The digitisation of technology has changed the way of human interaction in the 21st century. From accessing information, communication, human computer interactions (HCIs) and behaviour, to almost every aspect of human endeavours has digital-technology imprints. Higher education has not been immured from the augmented or assistive technologies revolution (Affouneh et al. 2024; Bayaga and Du Plesssis 2023). Globally, the digital-technology revolution has started to transform higher education practices, processes, and systems. Consequently, the role of the digital-technology revolution is evident in teaching and learning practices as well as in education administration. As a consequent too, it is rapidly becoming one of the most essential and widely practiced and simultaneously discussed phenomena in contemporary education policy in African countries (AL-Nuaimi et al. 2022; Lavidas, Komis, and Achriani 2022). The fledgling augmented or assistive technologies revolution in the higher education sectors shows some promise. One of which is by providing opportunities to reinvent themselves and but keenly overcome the digital related challenges that currently confront many of these countries. Ongoing scholarships in

Education specifically agree that digital technologies hold great promise for improving the teaching and learning processes (Bayaga and Du Plesssis 2023; Vargas-Arteaga and Gravini-Donado 2024). This optimism has raised the hopes of many in diverse African communities. Many stakeholders in higher education in Africa believe that equipping the institutions with quality digital technologies related learning materials and facilities, as well as with the human resources, Africa can begin the process of transforming and producing a technologically proficient workforce. Based on the need, the challenge is therefore about finding ways to appropriately integrate digital technologies in higher education practices in Africa to guarantee sustainable system. On the basis of the need too, the implications thus are that:

Firstly, there needs to be a focus on ways to effectively integrate the available digital technologies in education practices and systems, while also ensuring quality experience for students with varying abilities to promote student success and inclusivity. Secondly, radical solutions within these practices span artificial intelligence (AI), blockchain technology, augmented and mixed realities, game technology, quantum computing, quantum AI, mobile learning, Internet of things (IoT) technologies, open educational resources (OERs) advocated by libraries, cloud computing, geo-technologies, computer-mediated communication groupware, and more. Thirdly, with having many different types of digital-technologies and students with vastly different background in higher education, it is important for higher education practitioners, faculties, legislators, and policy makers to understand the radical solutions or best practices and learning systems. The reason is for stimulating and driving meaningful pedagogy and academic administration through digital technologies to service higher education students who have a wide range of needs and challenges. In response to the three (3) implications, the special call focuses on the best practices and opportunities in digital technologies that can support today's teaching and learning processes and academic services in higher education in African countries through the following articles:

In the leading article examining "GeoGebra, a Dynamic Software for Conceptual Understanding and Visualisation through a Multi-directionality of influence", Anass Bayaga delves into the dynamic interplay between GeoGebra, a prominent interactive digital tool, and science, technology, engineering, and mathematics (STEM) cognition, focusing on teachers. Bayaga aimed at assessing the hypothesis that GeoGebra significantly influences cognitive outcomes through a Multi-Group Analysis (MGA) using Partial Least Squares-Structural Equation Modelling (PLS-SEM). In effect, a significant direct pathway (Analogical Comparison Principle (ACP) and Error and Misconceptions Reflection Principle (EMR) and between Mathematical and Computational Algorithms (MCA) and Analogical Comparison Principle (ACP)) established empirical evidence to the theory that GeoGebra can facilitate

conceptual understanding as well as cognitive development. Additionally, the indirect pathways with no significant effects such as Mathematical Cognition (MAS) to ACP to EMR was indicative of the fact that influence of GeoGebra operates more through direct interactions with the software as opposed to through mediated learning processes. The article affirmed that influence of GeoGebra is not uniform across all contexts, indicative of the fact that factors such as geographical location play a critical role in shaping the software's effectiveness in enhancing STEM education. In sum, while GeoGebra is a potent interactive digital tool for enhancing STEM cognition, the results call for tailored strategies in integrating digital tools like GeoGebra, by considering the specific needs of different learning context, particularly paying attention to the contrast between urban and rural educational settings.

In "YouTube Video Approaches to the Rescue of Learning English Language in Higher Education in selected African countries" Mthembu and Khoza investigated the use of YouTube videos in learning English language toward disruptive or alternative innovations for students learning anywhere in the world. That is because, YouTube English language learning videos have been dominated by content-driven and outcomes-driven curriculum approaches at the expense of a self-driven approach. The findings indicate that the dominance of two approaches which have produced tension between them that needs to be addressed by a self-driven approach which is capable of creating a space for self-reflection before learning processes take place. It was concluded that a self-driven approach concentrates on actions, beliefs behind the actions, and their outcomes of using YouTube videos. The study recommends the application of a self-driven approach and awareness of natural forces/laws that promote natural actions, thus addressing personal, and natural needs.

Bayaga and Madimabe Assessed "Unified Theory of Acceptance and use of Technology (UTAUT) Model as Means to Maximise Teacher Collaboration in the indigenisation of Mathematics Pedagogy". The examination was heralded by the fact that prior research reveals a persistent lack of interest from teachers to engage in Content-based collaborative teaching communities. This obscurity often results in teachers working in isolation, detrimentally affecting the implementation of indigenised innovative digital pedagogies. Bayaga and Madimabe consequently investigated the interplay between teacher collaboration and the indigenisation of secondary school mathematics pedagogy (SS-MP) via the UTAUT model using PLS-SEM by analysing five (5) hypotheses. The authors revealed significance of behavioural intention (BI) and attitude (ATT) in predicting the successful indigenisation of mathematics teaching practices. Additionally, Use Behavior (UB) reveals potential for refinement in predictive performance. Policy implications do emphasise tailoring educational technology integration policies, with reference to infrastructure and supportive conditions,

whereas, for managerial level, targeted professional development initiatives as well as positive social influences are crucial.

Nnadozie and Chinomona propose a work systems framework for the management of teaching workload in the context of "Work Systems Framework for Teaching Workload Model Deployment at Universities in South Africa". The proposal was anchored on the fact that academic workload management is a growing concern of higher education institutions in South Africa. The authors contend that in South Africa, the headcount of students in the higher education system has increased from under 600 000 in the year 2000 to over 1 000 000 in 2020. This implies an additional 400 000 students into the system over the period. However, state subsidies have not kept pace with inflation and the growth in student numbers. The teaching load has evidently increased without corresponding growth in resources. The situation necessitates optimal planning and distribution of resources particularly academic personnel, thus need for the study.

In "Exploring the use of Digital Technologies to Tackle Inequities in Assessment at Higher Education institutions", M. W. Lumadi' s intention is to underscore the significance of using digital technologies to assess students with disabilities at institutions of higher learning. The concern to ensure equity and equality in assessment is evidenced in the findings. Several noteworthy findings were deliberated. For instance, the finding includes the use of digital technology is successful in increasing the inclusion and accessibility of students with disabilities. Technology-based formative assessments can present real-time reporting of results, allowing stakeholders to know students' strengths and weaknesses, while guiding them to make valid, actionable interpretations of the assessment data. As a result, it was recommended that the use of digital technology for students with disabilities needs to be addressed by policymakers and researchers. Students with disabilities should have the same rights to participate in assessment as other students.

"A Systematic Review of The Transformative Impact of the Digital Revolution on Higher Education in South Africa" was conducted by Mabidi. The study recommended that key stakeholders of higher education institutions can improve teaching and learning in the digital revolution, albert, various challenges and opportunities exist for the digital revolution in higher education institutions in Africa.

R. I. Lumadi examined "The Influence and Effects of Digital Revolution on Africa's Higher Education Systems" by exploring the challenges posed by the digital revolution and its influence on the education system. The Technology Acceptance Model emerged as the suitable framework, highlighting that user perception of technology's user-friendliness and utility predicts their attitude towards adopting digital tools. The study's outcomes predominantly

favour the facilitation of the learning process. Constructive feedback accentuates the efficacy of technology-enhanced tools such as announcements, videos, discussion forums, and blogs, which promote interactivity and enrich the overall learning journey. Considering these findings, the study proposes that higher education institutions cultivate a professional migration identity by embracing platforms like Moodle. The migration process could commence with platforms such as WhatsApp, TEAMS, and Zoom video conferencing. This strategic approach is recommended to effectively address technological hurdles, ultimately enhancing, and sustaining online teaching and learning practices.

"Decolonising Educational Technology in a Pragmatic Curriculum: A Systematic Review", was conducted by Makumane, Nkohla and Khoza. The review was based on the fact that a debate rages between educational technologists on keeping educational technology as a field of study, and non-educational technologists on defining educational technology as any usage of a technology in education. Since the emerging of the COVID-19, this debate has caused tension in higher education in terms of technology usage. This is because each of the two sides believes that its position in the debate represents an objective reality of quality educating. This tension has motivated this study to decolonise educational technology in a pragmatic curriculum based on scholarly publications published during or post the COVID-19 revolution. The findings indicate that most of the technology usage promoted a performance-based (field of study) and/or competence-based (solely technology usage) curriculum at the expense of the pragmatic or natural curriculum that promotes personal or natural identity. This suggests that higher education was only addressing professional needs in terms of "what" questions, and/or societal "how" questions. A pragmatic curriculum is driven by the importance of actions (educational technology as a field of study), beliefs behind the actions (pragmatic), and their outcomes (usage of a technology). This study therefore recommends the use of a pragmatic curriculum and awareness of natural forces/laws that promote natural actions, thus addressing personal needs through personal "who" questions, and natural needs through "why" questions.

On the other hand, Pitso, Tjabane, Pillay, and Bojabotsheha examined "Post-Covid-19 Universities: Opportunities and Challenges for Technology-Assisted Education". The Covid-19 pandemic accelerated the implementation of technology-assisted education in the form of remote learning. There are two sets of technology applications in education. The first factor set involves synchronous, technology-as-utility factor set 1 (FS-1). Another factor set is asynchronous, technology-as-essence factor set 2 (FS-2). To adumbrate a framework for theorising about technology-assisted education post-pandemic, five teachers with less than five years teaching experience and those with plus fifteen years teaching experience were

purposively selected to participate in Peer Conversational Interviews. The purpose was to find out if FS-1 or FS-2 was a preferred mode of technology application during and post-pandemic.

In the interim, Mpungose explored "Digital Skills: Academics at a South African University in the post-COVID-19 era" based on the idea that academics from South African Universities are bound to possess digital skills for curriculum delivery, due to the lessons learnt from COVID-19 era. As such Universities have implemented various interventions to enhance digital skills to academics, which include but not limited to training workshops, organized webinars, and seminars. Irrespective of these interventions, some academics still lake digital skills for effective digital curriculum delivery. Thus, the study's main objective is to materialize alternative pathways to overcome this lack of digital skills on academics. Therefore, this study draws on a three-year interpretive qualitative research project conducted at a South African university to explore a case of academics' reflections on the use of digital planforms for teaching and learning in the post-COVID-19 era.

"Engendering change: Feminist considerations of online conferencing as a safe space in the narratives of South Africa women academics during COVID-19" by Parry, Moodley, and Masisi argue that **t**he digitisation of education that has deliberately reformed the pedagogical practices of tertiary education in the 21st century, rapidly transformed all aspects of academia during the COVID-19 pandemic. Academic conferences, as traditional sites of embodied knowledge production, were also impacted and virtual conferences were quickly adopted as socially responsible alternatives. As a component of contemporary academic work, conferencing is meant to foster networks of community and support deep learning but are most often criticised as sites that reproduce prevalent discriminatory academic hierarchies. The most common observations in gender analysis of conferencing report on inequalities of representation and the absence of women in key roles. As organisers of the Southern African Student Psychology Conference (SASPC), the authors explore their experiences organising their first online conference in the context of the pandemic. Unfortunately, very few researchers have considered the representative space of online forms of conferencing, and to date none reflect the experiences of women academics from South Africa. This article aims to extend these examinations of the gendered nature of academic conferencing by utilising Empowerment Theory (ET) to understand narrative reflections from three women academics and organisers of an online Southern African conference. Collaborative Autoethnography (CAE) served as a critical emancipatory tool for collectively gathering counter stories of our internalised oppression as marginalised women academics. Consequently, this article explicates the gendered dynamics of academia, as well as sustainable pedagogical possibilities for change that is engendered by technology through online spaces as important sites of agency and resistance.

Finally, “An exploratory study to evaluate the teaching strategies in the hybrid Higher Education classroom” by Van Wyk and Rosa presents the findings of a South African study conducted in a private Higher Education Institution. The aim of the article was to explore teaching strategies suitable for hybrid classrooms, to create an environment to integrate virtual and in-person student groups for optimal learning outcomes. The study emphasised the necessity of an inquiry-based mindset in the hybrid teaching environment. The focus groups unanimously advocated for adopting an “adapted student-centred instructional approach” to address hybrid classroom challenges. This research contributes to understanding student-centred teaching strategies in hybrid classrooms. The key insight was that teacher-centred approaches by academic staff did not equally integrate virtual and in-person student participation. The study underscores the importance of lecturer training in effective student-centred teaching strategies for optimal learning in hybrid classrooms.

In conclusion, the contributions aforementioned aimed to capture the spectrum set out by the articles through;

- Digital revolution and its impact on higher education systems in developing African countries
- Students with disabilities in Higher Education: Using information and communication technologies to address inequities in education
- Artificial intelligence technology in teaching and learning of university students with varied cognitive abilities: Promises and Implications
- Artificial intelligence in higher education: Scope for intelligent tutoring systems
- Blockchain technology in higher education
- Augmented and virtual reality as an emerging didactic resource for teaching quantitative subject areas
- Maximising engagement and learning outcomes with m-learning and e-learning
- Digital technology in education and the law
- Digital-technology and indigenous knowledge systems and practices

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