

African philosophy for successful integration of technology in higher education

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Abstract

Due partly to the multimodal and multiscalar nature of technology applications, there lacks theories to explain successful technology integration in teaching and learning in higher education. Such multidisciplinary theories developed primarily within Western contexts as behaviourism, cognitivism, constructivism, connectivism, collaborationism, TPACK framework and authentic learning theory have been used to underpin technology-enhanced teaching and learning globally. However, their primary focus on basic education and their sensitivity to contextual reality seem to restrict their salience and fecundity to successfully explain technology integration in higher education in the Global South, including Africa. For more contextual relevance and significance, the embodiment in curricula and pedagogy of African knowledge systems and emerging societal needs and challenges is thus critical. Drawing on Asabiyya and Ubuntu humanistic philosophies respectively from Northern and Southern Africa and Yoruba empiricist and Zara Yacob rationalist epistemologies from Western and Eastern Africa, this study proposes African philosophical perspectives to underpin technology integration in higher education. The epistemologies define the nature of student and faculty engagements and strategies, whereas the humanistic philosophies offer values that could guide ethical technology use and engagement. Technologies are conceived alternatively as knowledge banks, communication media and cognitive tools to think through and with. Implications for further research and practice are identified.

KEYWORDS

African philosophy, Asabiyya, Hatata, higher education technology integration, Ubuntu, Yoruba, Zara Yacob

Practitioner notes

What is already known about this topic

- Multidisciplinary theories developed primarily within Western contexts are used to underpin technology-enhanced teaching and learning globally.
- Their primary focus on basic education and their sensitivity to socio-cultural and economic contextual reality restrict their salience and fecundity to successfully explain technology integration in teaching and learning in higher education in the Global South, including Africa.
- African philosophical, theoretical, conceptual and methodological thinking is critical for successful technology integration.

What this paper adds

- This study interrogated how African philosophies of humanity and knowledge could support successful technology integration in teaching and learning in Africa.
- Drawing on Asabiyya and Ubuntu philosophies, respectively, from Northern and Southern Africa, the study proposes strategies for making the oppressive faculty–student relationships rampant in African campuses more humane and emancipatory.
- Drawing on Yoruba empiricist and Zara Yacob rationalist epistemological orientations from Western and Eastern Africa, this study proposes strategies for supporting truly engaging and empowering pedagogies within technology-enhanced spaces.

Implications for practice and/or policy

- The purpose of education in successful technology-enhanced spaces needs to aim at improving student capacities and skills for further learning and to ensure full participation in practice communities within and outside higher education.
- The content of education or curriculum needs to primarily embody African/local philosophical, theoretical, conceptual and methodological thinking, as well as emerging community needs and challenges.
- The method of education and student assessment need to support and promote the cultivation of student skills and capabilities as well as values and ethics highly needed in their communities and beyond.

INTRODUCTION

How is successful or effective integration of digital technology in teaching and learning in higher education (HE) conceived? Due partly to the multimodal and multiscale nature of technology applications, there lacks holistic theories to explain the phenomenon. However, multidisciplinary theories, including behaviourism, cognitivism, constructivism, connectivism and collaborationism (Harasim, 2017; Sattar, 2017), TPACK framework (Mishra & Koehler, 2006) and authentic learning theory (Herrington & Parker, 2013), have been used

to underpin technology-enhanced teaching and learning globally. Although these conceptions contribute to our understanding of the phenomenon, their primary focus on basic education and their sensitivity to contextual reality seem to restrict their salience and fecundity to successfully explain technology integration in teaching and learning in HE, especially in the Global South.

Even *blended learning*, which appears to be the most prevalent form of technology integration in HE (Garrison, 2011), lacks sound theoretical explanations (Andrews, 2011; Bekele et al., 2022; Halverson et al., 2014; Kirkwood & Price, 2014). To map out the core features of blended learning in HE globally, Bekele et al. (2022) conducted a configurative review of theoretical and conceptual frameworks developed by Bekele (2009, 2010), Bekele and Menchaca (2008), Garrison (2011), Johnson et al. (2008), Khan (2010), Lim and Wang (2016), Mishra and Koehler (2006), Ojha and Rahman (2021), Shea (2007), Shea and Bidjerano (2010), Wagner et al. (2008), Wang et al. (2015) and Wong et al. (2014). The review identified such indicators of successful or effective blended learning as student satisfaction, engagement, motivation and attitude; student performance in examinations; knowledge acquisition, construction and lifelong learning spirit; higher-order thinking including meta-cognition; course instrumentality; rate of return; and sustainability and scalability. It is interesting to note that most of the success indicators identified are linked to quality student learning experiences and advanced learning outcomes, which policy makers, potential employers and practitioners consider relevant for socio-economic development. The next logical question to raise is linked to the factors that affect these learning outcomes or success indicators.

The Bekele et al. (2022) review mentioned above also identified categories of success factors at individual (faculty and student), institutional and national levels. The most frequently cited factors, in their order of mention, are student characteristics; institutional support systems (policy, strategy, goal, vision, infrastructure, support systems, faculty professional development); faculty characteristics; pedagogical factors (teaching and learning approaches, strategies, methods including social presence, interaction, engagement and collaboration); technology attributes (usefulness, ease of use, flexibility and capability); and course relevance and quality. Student and faculty characteristics include their conceptions of learning, teaching, knowledge and technology and its role; their past experiences with technology; their knowledge and skills of particular technologies, and their needs and expectations. What appears significant and interesting is that technology attributes are not considered among the most frequently mentioned success factors; there is more to learning and teaching in HE than technology.

Although the aforementioned theoretical and conceptual frameworks could deepen and extend our understanding of technology integration, their adequacy to satisfactorily explain the varied modalities of blended learning applications (Margulieux et al., 2016) across disciplinary cultures and cultural settings remains unclear. Moreover, their relevance and adequacy to explain purely online learning is unclear. These conceptual issues along with the following theoretical and methodological challenges justify the need to have further study and theorisation on this significant and timely topic in HE, especially in Africa where there is a dearth of scholarship on the topic.

First, literature (Cheng et al., 2021; Chuang, 2016; Morgan, 2014; Woodley et al., 2017) indicated that technology integration is culture sensitive. However, the aforementioned conceptualisations of successful technology integration are developed within Western/Northern cultural settings. The inconspicuousness of the philosophical, theoretical, conceptual and methodological thinking from the Global South could partially be attributed to marginalisation by researchers in the West/North (Connell, 2007, 2017; Haybano et al., 2021). It could also be attributed to the lack of research support systems and research productivity in the Global South. Irrespective of the reasons, there is a clear gap in our understanding of the

phenomenon in the diverse and massifying African HE system. The historico-cultural contexts and academic cultures of African HE need to be considered for creating useful theoretical explanations of phenomena generally (Bekele et al., 2022; Bekele & Ofoyuru, 2021; Oplatka, 2019; Schalkwyk, 2015).

Furthermore, African HE is mainly a European (colonial) creation (Assie-Lumumba, 2006; Cloete & Maassen, 2015). The primary mission of universities upon their founding and decades afterwards has been to generate and transmit ideology in service of colonial interests (Balsvik, 2005; Kom, 2005; Mayaki, 2019), wherein Western curricula were transposed into African campuses with no consideration for local relevance (Amponsah & Babarinde, 2022; Kom, 2005). This transposition 'caused a huge disruption in the transmission of our (African) knowledge and traditions' (Mayaki, 2019, p. 47). Moreover, there lacks critical scholarly engagements in African campuses (Dei et al., 2019; Kom, 2005; Nhemachena & Mawere, 2022) and the master–slave faculty–student relationships reflect power dynamics at the national level. For more contextual relevance and significance, educational reform generally and successful technology integration particularly need a reconceptualisation of curriculum and pedagogy against the backdrop of African knowledge systems, and emerging societal needs and challenges.

Our thesis is that faculty conceptions of social reality and knowledge are among the decisive factors for technology integration. One, they directly and substantially affect not only success indicators (quality student experiences and advanced learning outcomes) but also success factors such as student characteristics, and pedagogical and course factors (Bekele, 2009; Garrison, 2011; Lim & Wang, 2016; Mishra & Koehler, 2006; Shea & Bidjerano, 2010). Two, assumptions and questions about the nature of social/natural reality and knowledge also 'identify the major concern of education and provide the possibility for coherence in educational practice' (Koetting & Malisa, 2004, p. 1012). Three, although attribution is often made to colonialism, faculty characteristics also contribute to the domineering faculty–student relationships and dictating pedagogies in African HE (Kom, 2005; Nhemachena & Mawere, 2022). Consequently, interrogating faculty philosophy of humanity and knowledge is vital for meaningful integration of technology in HE in Africa.

Against the backdrop of the arguments presented above, we conjecture that successful technology integration in teaching and learning in African HE assumes revitalisation and reconceptualisation of African university education. Specifically, inclusion in curricula of local knowledge systems and societal needs and challenges, and adoption of more engaging, empowering and emancipatory pedagogies are vital for success. Our thesis is that the embodiment in curricula and pedagogy of African philosophical, theoretical, conceptual and methodological thinking (Connell, 2007, 2017; Gutema, 2013; Haybano et al., 2021; Verharen, 2013) is among the critical factors for successful technology integration and further theorisation. This study aspires to interrogate African philosophies which could trigger and support faculty revisioning of their philosophy about humanity and knowledge. We, thus, aspire to provide African philosophies of humanity and epistemology that could offer the conceptual scaffolding for the anticipated revisioning.

The study revolves around answering this overarching question: How could African knowledge systems support successful integration of digital technologies in teaching and learning in HE? The following specific questions guide the study.

- How do African philosophies view human beings and their interrelationships? What implications could these philosophies have to the reconceptualisation of faculty–student relationships in technology-enhanced teaching and learning spaces?
- How could African epistemologies support more engaging, empowering and emancipatory pedagogies in technology-enhanced spaces?

STUDY APPROACH AND SIGNIFICANCE

This study interrogated how African philosophies of humanity and knowledge could support successful technology integration in teaching and learning in HE. There are several continental-level initiatives that could justify the significance and potential contributions of this study. The post-Covid intensification of technology integration in African HE institutions (Bekele, 2021; Teferra, 2021) demonstrates the significance and timeliness of our contribution. Specifically, strategic planning in African HE institutions identifies technology integration as one of the strategic pillars for improving quality and competitiveness of education (Bekele & Ofoyuru, 2021). Moreover, the quality or success of African international university-society partnerships is partly affected by the further integration of technology (Bekele et al., 2021). The African Union (AU) and its member countries also consider technology integration as one of the strategic pillars for meeting the 2030 Sustainable Development Goals (SDGs) and the AU 2063 Agenda. This study stands at the heels of these development initiatives and aspires to trigger and drive further theorisation and research on this significant and timely topic in African HE.

Although African philosophy encompasses all the main branches of philosophy as a discipline (Wiredu, 2004), we examined African philosophies of humanity and knowledge for focus and scope. Specifically, for their complementarity, relevance and significance to technology integration, we interrogated Ubuntu (from Southern Africa) and Asabiyya (from Northern Africa) philosophies of humanity. Ubuntu has been considered as a possible pedagogical philosophy and a prospective governmental policy that is connected to explaining how the marginalised in societies are treated. As an indigenous knowledge system, it could similarly be used to enhance effective online teaching and learning in African HE (Daniel et al., 2009; Zireva, 2016). Moreover, Islam, a guiding tenet for Arab African countries and a framework for generating new knowledge in many African universities (Lo, 2016), is integrally connected with technology (Mohammed et al., 2021). Asabiyya, which generally means humanity to others, is considered the Arab equivalent to Ubuntu. These worldviews (Asabiyya and Ubuntu) embody assumptions about human beings and their interrelationships which could trigger and drive the reconceptualisation of the existing master–slave faculty–student relationships in African campuses.

As 'one's view of knowledge affects one's view of learning and teaching' (Bekele et al., 2022, p. 11), we also interrogated what *knowledge* is and how it is created and disseminated in African societies. We considered the Yoruba and Zara Yacob philosophies respectively from West (Nigeria) and East (Ethiopia) Africa for the following reasons. One, African philosophy 'has a communal as well as an individualised component' (Wiredu, 2004, p. 22). The Yoruba philosophy of knowledge is communal whereas Zara Yacob's is individualised. Featuring the two knowledge perspectives could support a holistic analysis and cross-fertilisation of ideas having direct implications to teaching and learning. Two, the Yoruba has a clear empiricist orientation whereas Zara Yacob has rationalist orientation. Literature (Mautner, 2005; Pinchin, 2005) considered empiricism and rationalism as alternative traditional theories of knowing. We also consider these orientations not as conflicting knowledge cultures but as alternative and complementary cultures to satisfactorily study the phenomenon. Hence, we promote the empiricist-rationalist continuum as a useful epistemological heuristic that could support knowledge production and dissemination across disciplinary cultures. The two theories of knowledge could give us a glimpse of the conditions driving knowledge production in West and East Africa and could jointly exhaust methodologies and theories humans need to produce and transfer knowledge.

Overall, this study examined the implications these philosophies of humanity and knowledge could have to successfully integrate technology in teaching and learning in African HE. The goal is not so much to create consensus about and make generalisation to African

philosophy as applied to technology integration but to demonstrate the existence of relevant local knowledge systems that could meaningfully underpin technology integration in teaching and learning in African HE. If carefully considered, the African philosophies discussed below could invite faculty to deeply reflect on their views about humanity, knowledge and its production and validation as well as the implications these have to teaching and learning. It could better inform the intentional and effective integration of technology in HE. As the process begs for faculty deep reflections, this approach is also conceived as an innovative design for supporting (faculty) professional learning and development. This embeddedness in local knowledge systems to support technology integration is the unique and original contribution of this paper to HE studies in Africa generally.

For clarity, the following points need mentioning. We view *educational (digital) technology* not simply as a software-hardware phenomenon but as a 'system' or an 'environment', as its successful integration in teaching and learning requires the systematic and simultaneous consideration of faculty, student, course, pedagogic, policy and technological factors outlined above. Technology attributes are only among the many factors needed for success. As indicated in the introduction section above, this study focuses on faculty conceptions of humanity and knowledge as these affect all the other success factors. Furthermore, we adopt the *learning through technology* (Hill et al., 2004), *learning from technology* (Jonassen & Reeves, 1996) and *learning with technology* (Jonassen & Reeves, 1996) conceptions as generic and complementary strategies to support the successful technology integration in teaching and learning across disciplinary cultures. These concepts respectively support communication and interaction between faculty and students, access to subject matter content and general knowledge, and construction of meaning, knowledge and/or artefacts across the disciplines. However, depending on the nature of courses and tasks at hand, one mode of technology use could be 'majored' over the others at some point during instructional time.

The central argument of this study is that local knowledge systems should provide the conceptual scaffolding for technology integration in HE, as that could contribute to the relevance and impact of education. We consider Scaratti et al.'s (2017) definition of *relevance* as 'something that matters to the everyday work experience of practitioners: to their problems and issues, to the meanings and values they give to the problems they face and to knowledge which helps them analyse, understand and develop possible solutions' (p. 59). Technology integration should embody the values, traditions, problems, needs, experiences and generally meanings of both faculty and students. This is possible partly through drawing on African philosophies of humanity and knowledge. This grounding in local knowledge systems could have contributions or benefits not only to faculty and students but also to society at large.

It has to be noted that the proposed philosophical perspectives are not considered as causes for successful technology integration as such but as triggers and enablers of more humanely and engaging, empowering and emancipatory pedagogies in technology-enhanced spaces in Africa. Institutional theories indicated that there is usually decoupling between policy and practice or intention and action at organisational and national levels (Meyer, 2009, 2010). Thus, it has to be noted that the mere adoption of African knowledge systems in university curricula and pedagogy could not guarantee successful technology integration, as it also summons the collective wills, capacities and sustained actions of university leadership, faculty, students and quality assurance agencies alike.

Drawing on the conceptions of technology role discussed above and African knowledge systems, we aspire to identify strategies to trigger and support successful technology integration in face-to-face, blended and purely online teaching and learning settings in African HE. We conjecture that the philosophical lenses presented in this study are relevant to these teaching and learning spaces although some disciplines could primarily

use one lens over the others across instructional times, see the section on African theories of knowledge.

Finally, we draw on the Bekele et al. (2022) study highlighted above to problematise successful or effective technology integration in HE in Africa. It is chosen for its comprehensive list of both success factors and success indicators in technology-enhanced spaces in HE based on a configurative review of prominent theoretical and conceptual frameworks. Its consideration of the process and product dimensions of teaching and learning as linked to knowledge production and dissemination also appear consistent with the values and principles of African philosophies discussed below. Accordingly, indicators of success or effect could include student satisfaction, motivation, engagement and attitude; knowledge acquisition, construction and lifelong learning spirit; higher-order thinking skills such as problem solving and critical thinking; course instrumentality or relevance; and sustainability and scalability of technology-supported teaching and learning. Technology integration that supports these learning processes and outcomes could be considered as engaging, empowering and emancipatory. This is possible primarily when the age-old oppressive and domineering faculty–student relationships and pedagogies rampant in African campuses are deconstructed. The African philosophical perspectives outlined below could invite and support the deconstruction of existing ideologies and discourses.

AFRICAN PHILOSOPHIES ABOUT HUMANITY

Globalisation has largely succeeded in connecting many nations into what has become a ‘global village’. Despite this phenomenal achievement, researchers (eg, Menon, 2022; Shihade, 2022; Zireva, 2016) have cautioned that the dwindling of the world into a ‘global village’ does not necessarily translate into a fair representation of cultures and values. Indigenous African education was, for instance, collaborative and cooperative and was situated in nature where young and old gathered to share knowledge while drinks or food was being shared among them (Amponsah, 2023). Following the introduction of ‘modern’ schooling, master–slave faculty–student relationships became rampant in African campuses. Consequently, we conjecture that adopting humanely philosophies could support decolonisation and deconstructive efforts in African HE. This brings into the fore the relevance of Asabiyya and Ubuntu as humanistic philosophies that could guide the successful integration of technology in African HEs. At the heart of these philosophies lies the need to appreciate diverse values and fair treatment across different cultural and learning spaces.

Popularised in the 1990s in South Africa as a guiding ideal to help transition the country from apartheid rule to a democratic nation, Ubuntu hinges on communal interdependence. Zireva (2016) traces the roots of Ubuntu to an African normative traditional adage found in different Bantu-speaking people in Southern Africa. The root of the philosophy has a strong connection with an IsiZulu/IsiNdebele adage *‘umuntu ngumuntu ngabantu’* and Sotho variation, thus *‘motho ke motho ka batho’*. These adages roughly translate into English as *‘a person is a person through other persons’* (Letseka, 2013, p. 339). The Ubuntu ideology is concerned with social values such as empathy, care, sensitivity to others’ needs, respect, thoughtfulness, patience and kindness (Chikanda, 1990). It is also a manifestation of moral qualities including the capacity for open communication, engagement, sharing and reciprocity, as well as harmony, cooperation, congruence and a common worldview (Makhudu, 1993). These ideals are instrumental in creating conducive technology enhanced classrooms. Leaning towards humanism is an effective strategy to break the master–slave learning environments to a more collaborative, cooperative and learner-centred learning environments.

A participant in a study by Fomunyam (2017), which theorised the need to decolonise the engineering curriculum of South Africa, stated, 'European or foreign curriculum doesn't consider who we are, our cultures or beliefs or things like Ubuntu. The department needs to look at social justice issues to ensure that we are not only engineers but African engineers' (p. 6802). This anecdote portrays the frustration of both academics and students in African HE whose teaching and learning are framed in Western philosophies. It, therefore, comes with little surprise that Fomunyam (2017) recommended that the language of instruction, pedagogy, teaching and learning process and theory and practice in African HE should be critically interrogated to enhance the training offered to students. As per Ubuntu, a teacher is a teacher through his/her students and students are students through their teacher. Belief in this principle and accompanying actions could demolish the domineering faculty–student relationships prevalent in African campuses, including in technology-supported learning environments.

Moreover, the literature establishes that roles are swapped between faculty and students in technology enhanced classrooms. Thus, whereas students do more work than faculty in traditional teaching and learning environments, the converse is the situation for hybrid and fully online teaching and learning environments (Amponsah et al., 2019). This could be a disincentive to African faculty who are mostly overwhelmed by high student numbers and the lack of digital tools to facilitate their work (Adarkwah, 2021). Under such compelling circumstances, facilitators who are imbued with the ideology of Ubuntu such as empathy, patience and kindness (Letseka, 2013) could give off their best to make technology-enhanced environments meaningful for their students. Generally, faculty–student relationships characterised by respect, empathy, cooperation, harmony, open communication and thoughtfulness not only establish the conducive environment for teaching and learning but also are critical for adopting emancipatory and engaging pedagogies. Essentially, these relationships are effective cannons for overcoming the remnants of colonial legacies that might have found their way to teaching and learning environments.

Similarly, as a socio-political contract, Asabiyya upholds a decolonising ideal against the rise of neoliberalism that challenged the Arab world (Menon, 2022). Asabiyya seems to provide a solidarity framework that can help countries to combat all forms of injustice and sustain their societies (Shihade, 2022). Ibn Khaldun, the father of Asabiyya, argued that a privileged and luxurious lifestyle imposed by Western traditions decreases morality, disintegrates societies and promotes laziness, inertia and conformism (Arpa, 2021; Menon, 2022). Though a painful period to humanity, the COVID-19 imposed lockdowns basically brought some parity to all humans. This period saw a significant and abrupt shift to the use of technology in both endowed and struggling economies. Juxtaposing this scenario with the philosophy of Asabiyya brings to mind the need for fair and equal treatment in technology supported learning environments.

Whereas Asabiyya was coined by Ibn Khaldun who stressed the importance of group solidarity to achieve the common good, bring about change in leadership and assume responsibility for humanity (Badroen, 2015). Written in the late fourteenth century, Ibn Khaldun explained Asabiyya in his *Al-Moqaddima* manuscript that examined human societies and the factors that sustain them (Shihade, 2022). In effect, Asabiyya is 'group cohesion and solidarity and more coherent to a life not threatened by modern lifestyle distractions' (Shihade, 2022, p. 25). It is a belief system that unites people towards achieving social cohesion by promoting a 'spirit of loyalty and cohesiveness to a common culture, language and code of behaviour' (Shihade, 2022, p. 25). Asabiyya supports the adoption of technology in learning in African HE but to sustain and optimise its benefits, there is the need to identify it as a tool for improving the lots of humanity and collectively work to ensure its sustenance. The idea of group cohesion could result in achieving social and cognitive

presences (Garrison, 2011), where faculty and students have a common purpose to achieve in technology supported spaces.

Furthermore, Asabiyya views technology and knowledge inseparable and they both complement one another because 'technology constitutes an embodiment of human's systematic effort in applying or utilizing knowledge or science so that they can give human some ease and wealth' (Sunhaji, 2018, p. 181). Teaching and learning are also at the core of Asabiyya and both go hand in hand with education in modern time (BaŞer, 2012). It is in this type of context that people are obligated to utilise the resources that were bestowed upon humankind for teaching and learning purposes because education is a divine command for all people (Faryadi, 2015). Asabiyya also uses both abstraction and empirical evidence in its quest for finding truth and knowledge. In his explanation of Asabiyya, Ibn Khaldun 'insisted that logical abstraction of universals could lead to an understanding of the essential nature of the physical world...and established empirical reality as an important object of inquiry' (Sumer, 2012, p. 255). Thus, Asabiyya supports the notion of learning through technology, learning from technology and learning with technology to explore and establish knowledge.

As the foregoing discussions indicate, the principles of Asabiyya and Ubuntu can serve as a middle ground for marginalised or disadvantaged values and cultures, which can, through their humane values, create a conducive environment for providing relevant education in Africa. Within the remit of Ubuntu philosophy, each person (faculty and students in this study) is socioculturally obligated to comport themselves humanely (Zireva, 2016). Ubuntu represents human kindness, which according to Rampa and Mphahlele (2016) means extending help to learners in the ethos of service delivery. It also portrays showing respect for others, being honest, reliable and valuing the benefit of learners. Similarly, Asabiyya associates the existence and continuity of cohesive societies with knowledge construction and cultural transfer, and views learning as a continuous process of discovery that invites truth and breathes hope into people's lives (Akyol, 2018). In this light, the elements of the two philosophies could decolonise learning and make learning more meaningful for students in African HEIs.

In essence, the uniqueness and special nature of these African philosophies in appreciating the provision of inclusive and collaborative environments can create and enhance liberating, emancipatory, empowering and impactful learning experiences for African HE students. These humane philosophies can promote social cohesion and solidarity and hence can counteract the oppressive and dictating faculty–student relationships and pedagogies rampant in African HE technology-enhanced classrooms. They could be considered as effective strategies to avert all forms of epistemic violence in teaching and learning in African HE. The philosophies can also be employed as effective lenses to underpin technology-enhanced teaching and learning through techniques such as student pairing and collaborative activities. Values such as respect for learners, empathy, patience and kindness towards students' needs, as well as enhancing effective communication also provide a conducive environment for teaching and learning in technology enhanced spaces. In addition, Asabiyya and Ubuntu-oriented faculty could exercise the spirit of humanity by being considerate and sensitive to students' values and cultures in their instructions and assessments. In effect, technology-enhanced teaching and learning could be tailored to reflect the tenets of essentialism wherein both academic content and moral knowledge are central to education (Belbase, 2011; Martin & Loomis, 2013). Overall, Asabiyya and Ubuntu principles and values, along with the Yoruba and Zara Yacob theories of knowledge consecutively outlined below, could trigger and drive the adoption of more liberating, emancipatory and empowering pedagogies in technology-enhanced teaching and learning environments in African HE.

AFRICAN THEORIES OF KNOWLEDGE

As explained above, the Yoruba and Zara Yacob theories of knowledge are found relevant to explain what knowledge is and how it is produced as well as the implications these have to teaching and learning in technology-enhanced environments in HE in Africa. This section interrogates these issues in their order of mention.

The Yoruba (one of the three largest ethnic groups in Nigeria) discourse employs unique terminology and systematic criteria for the production and evaluation of any type of information and knowledge (Hallen, 1998, 2004; Ofuasia & Ojo, 2016; Wiredu, 2004). The most relevant conceptions that have clear implications to our purpose are *imo*, *igbagbo*, *nwadi* and *papo*. On the basis of the evidential status of *experience*, the Yoruba discourse makes a clear distinction between what is termed in Western philosophy as putative knowledge and putative belief. In his article published in the Routledge Encyclopedia of Philosophy, Hallen (1998) highlighted that:

What one views with one's own eyes and experiences at first-hand (*imò*) are judged as reliable ways of knowing the truth, provided there is conscious comprehension of what one is perceiving. Only propositions describing such experiences are regarded as true, or *òtótó*. Less reliable is information received via books, other people, the media and the oral tradition. If such comparatively second-hand information, or *igbàgbó*, can be experimentally tested and accordingly verified, it has the potential to become *imò*. If verification cannot be attested, discussion, analysis and good judgement are essential tools for distinguishing the more reliable information from the less reliable. (n.p.)

Several points having clear implications to technology-enhanced teaching and learning in HE in Africa are worth highlighting. The evidential status of experience makes a clear distinction between *knowledge* and *belief*. To produce authoritative knowledge, one has to not only document or demonstrate first hand, empirical experience but also demonstrate their perception and comprehension of the phenomenon, asserting the critical role intentionality plays in epistemic processes. If these conditions are met and agreement or consensus is ensured among disputants, the knowledge produced is accorded the highest status—it becomes *imo*. This is the reason behind Wiredu's (2004) claim that the Yoruba discourse applies more stringent conditions for knowledge than what Western discourse does, as 'the prospective knower must have an eye-witness acquaintance with what is claimed to be known' (p. 7).

On the other hand, if the evidential status of experience is non-empirical, the knowledge produced is considered less reliable and authoritative, hence is considered to have the least epistemic status. This is generally called *igbagbo* which literally corresponds to *belief*. *Igbagbo* is equivalent to mean 'received, agreed to, heard or understood' (Hallen, 2004, p. 298). Also, certain *igbagbo* could be uplifted to *imo* on condition that disputants are able to document first-hand experience. If empirical grounding is found impossible, they still pass through a rigorous process of discussions, analyses, testimonies and reflections to distinguish between more reliable and less reliable information. This process of qualifying *igbagbo* is called *nwadi* and the agreement reached on *igbagbo* is called *papo*. *Igbagbo* without such possibility of epistemic uplifting is accorded the least certainty in Yoruba philosophy. Lastly, *imo* and *igbagbo* jointly exhaust all information humans need or have to properly function in their society.

Overall, the Yoruba theory of knowledge established stringent conditions for the production and dissemination of information and knowledge. The highest status is accorded to first-hand experience (*imo*), which links the theory to the Western school of thought called empiricism. Sensory experience is considered a critical factor for knowledge production and is consonant with science and the scientific method generally. Empiricism is generally

revered in the social and natural sciences as the most authoritative approach to knowledge production. Yoruba empiricism has thus direct implications to technology integration in African HE. Such efforts could benefit from the inclusion of empirical experience such as research-driven teaching and learning that aims to identify and solve real societal needs and challenges. Experiential learning, educational trips, extra-curricular activities, placement studies or internships, and university-industry collaborations and partnerships are also relevant avenues for supporting authentic learning and teaching experiences in technology-enhanced spaces.

Moreover, the Yoruba rigorous process of discussions, analyses, testimonies and reflections conducted to distinguish between more reliable and less reliable information is a valuable strategy for technology integration in teaching and learning in African HE. This strategy is critical as much instructional time is spent on interacting with non-empirical material and information we get from books, journals, people and the media. The stringent process of qualifying non-empirical material also promotes student creativity, critical thinking, problem-solving skills and reflexive capacities. Generally, the clear preference given to the empirical and the rigorous process used for qualifying second-hand information in Yoruba theory could support successful technology integration in African HE. What appears at face value as a conflicting theory of knowledge to Yoruba empiricism is Zara Yacob's rationalistic orientation, which we consider as an alternative and complementary conception vital for successful technology integration in teaching and learning in African HE.

Zara Yacob was an Ethiopian philosopher from the city of Aksum, the cradle of ancient Ethiopian civilisation. His philosophical treatise called *Hatata* was written in 1667 in the ancient Ethiopic language called Ge'ez. Zara Yacob's philosophy covers areas such as truth, theodicy, knowledge, individual and social ethics, psychology and human nature. The driving presupposition of his methodology of philosophy is 'the belief in the necessity of inquiry, in the light of reason' (Sumner, 2004, p. 176). *Hatata* as a methodology requires that profound reasoning shapes perceptions, imaginations, judgements and apprehensions (Teodros, 2004). It basically refers to

a mode of thinking marked by penetrating a phenomenon with the tools of inspection and examination piece by piece, layer by layer. The closest parallel is Descartes method as articulated in his *Discourse on Method*, where everything is doubted, including the philosopher's own existence, until after it is put through severe examination by reason unsupported by sense experience.

(Teodros, 1996, p. 44)

Zara Yacob's rational philosophy is considered the distinctive mode of thinking from Ethiopia and a contribution to the written history of African philosophy (Sumner, 1978, 2004; Teodros, 1996, 2004; Wiredu, 2004). Several points that have clear implications to technology integration in teaching and learning in HE in Africa are worth highlighting. Meaning, the following epistemic strategies or techniques could be effectively used in technology-supported teaching and learning in HE. A thinker intentionally doubts the truth value and significance of a phenomenon or what Paul and Elder (2008) called thought elements such as purpose, question, viewpoint, information, inference, concept, implication or assumption. The thinker then decides to systematically interrogate the identified thought element further. The purpose of such an interrogation is to produce justified beliefs about the truth value of the thought element. Profound reasoning is the methodology or mode of thinking or interrogation used, and not sensory experience. The methodology involves breaking down the thought element into its most constituent parts. Possible interrelationships or intersections between or among the parts are then identified and examined. This process of examination could involve identifying alternative and even conflicting explanations, interpretations, meanings to the thought element and then

qualifying them based on the power of reasoning. Finally, the thinker draws the most plausible or satisfying conclusions based on the analysis which justified the belief in the truth value of the thought element.

This mode of inquiry is comprehensive yet methodical and strategic, goal-driven and supports a rigorous examination of taken for granted assumptions or beliefs based on the power of reason. The outcome of Hatata is arriving at a conclusion, or a set of alternative conclusions or solving a problem at hand. It could partly be linked to *nwadi*, the rigorous process of discussions, analyses, testimonies and reflections applied to distinguish between more reliable and less reliable information in the Yoruba epistemology discussed above. The major difference is that certain *igbagbo* (belief) could be uplifted to *imo* (true knowledge) on condition of demonstrating empirical evidence, whereas Hatata entirely employs reason to produce justified true beliefs.

These rigorous methodologies generally appear consistent with conceptions of critical thinking provided by the major leaders in the field, Paul and Elder (2008). They defined *critical thinking* as the application of intellectual standards (clarity, accuracy, relevance, logicalness, breadth, precision, significance, completeness, fairness, depth) to the elements of thought/reasoning (purposes, questions, viewpoints, information, inferences, concepts, implications, assumptions) for the purpose of developing intellectual traits (humility, autonomy, integrity, courage, perseverance, confidence in reason, empathy and fair mindedness). Although Paul and Elder's individual intellectual standards and traits might not be directly traced in the Yoruba and Zara Yacob theories, the latter's comprehensive and methodical process used to interrogate phenomena to arrive at warranted conclusions or useful solutions appear congruent with the fundamental ideas of critical thinking. We thus conclude that empiricism and rationalism as theories of knowledge are not endemic to the West; African societies also employ such stringent and methodical tools to produce and transfer useful information and authoritative knowledge.

In sum, the two inquiry modes appear consistent with the principles of project or problem-based learning, discovery learning, inquiry-based learning and constructivism, which are generally considered relevant within technology-enhanced learning and teaching environments in HE globally. These modes of thinking along with the empirical approach promoted in Yoruba epistemology provide sufficient methodologies for the production and dissemination of information, knowledge and/or artefacts within technology-enhanced teaching and learning across the disciplines. Certain fields in the humanities such as philosophy employ rationalism as the sole inquiry mode, whereas the social and the natural sciences and engineering fields generally employ empiricism and rationalism as complementary inquiry modes.

Our thesis is that the Yoruba empiricist and Zara Yacob rationalist strategies scaffold by Ubuntu and Asabiyya humanistic philosophies could support successful technology integration in HE in Africa. The following paragraphs further exemplify the multifaceted roles technologies could play in those learning and teaching spaces. As discussed in the introduction section, African HE lacks local relevance and critical engagements, and it also suffers from domineering faculty–student relationships. Employing the Ubuntu and Asabiyya humanistic philosophies and the Yoruba and Zara Yacob theories of knowledge in technology enhanced spaces could contribute towards overcoming these afflictions. The theories of knowledge provide conceptual scaffolding to define the nature of student and faculty engagements with content, engagement strategies and advanced learning outcomes discussed above. On the other hand, the humanistic philosophies primarily offer values and principles that could enhance ethical engagements and technology use, and challenge domineering faculty roles linked to teaching and communication. Meaningful engagements with contents or tasks require availability of updated subject matter knowledge, and effective and transparent communication routines. Technology is thus conceived to play critical roles along those

lines; it is considered as the catalyst, environment, platform or medium that enables engagements and communications. Consequently, successful technology integration in teaching and learning across disciplinary cultures manifests in varied forms.

One, technology enables the availability and accessibility of the latest subject matter knowledge which is a particular challenge to many universities in Africa. Because of open access policies and the increasingly improving technology infrastructure and Internet connectivity in Africa, knowledge increasingly becomes a public commodity or domain. Learning management systems and the Internet generally allow access to subject matter and general knowledge which adds more currency, relevance and significance to curricula. Technology could also serve as a virtual memory space where the information, knowledge and/or artefacts students produce are deposited for later reference. This technology application is generally consistent with the learning from technology conception (Jonassen & Reeves, 1996). Generally, the application of Yoruba and Zara Yacob epistemic strategies could partly be enhanced by technology as it supports uploading and downloading latest scientific knowledge and student artefacts. This is a significant application of technology in Africa as it adds more relevance and significance to curricula and as it lays the foundation for more rigorous technology-enhanced engagements.

Two, a more advanced technology application requires the construction by students of meaning, knowledge and/or artefacts. Meaningful adoption or adaptation of the Yoruba and Zara Yacob epistemic strategies requires students to engage with worthwhile problems or tasks, with the aim of arriving at warranted conclusions, useful solutions or artefacts. To accomplish such advanced tasks, technology is employed to: search for or capture data or information, identify the precise knowledge gap or available solution options, generate appropriate and effective strategies, aid actual data or information analysis (including making simulations, coding and categorisation), validate or falsify student produced-knowledge or artefacts (eg, using AI and Turnitin), visually represent complex ideas, and compose and edit student-produced materials (eg, using digital or personal assistants). These advanced technology applications are consistent with Jonassen and Reeves' (1996) learning with technology and Garrison's (2011) cognitive presence conceptions; technologies are used as cognitive tools to think through and with. These technology applications substantially aid the rigorous Yoruba and Zara Yacob epistemic strategies to produce, transfer and translate knowledge or artefacts.

Three, as discussed above, the stringent and rigorous Yoruba and Zara Yacob methodologies aim at producing and sharing useful information, authoritative knowledge or artefacts, making learning and teaching truly social and communicative. The epistemic strategies support communication and interaction not only with content but also among students, and between faculty and students which is generally consistent with the learning through technology conception (Hill et al., 2004). Technologies are used as communication tools enabling dissemination, presentation, publication and anytime anywhere communications between faculty and students. Technologies are thus used as tools for creating and enhancing a sense of community or what Garrison (2011) calls social presence in teaching and learning. The principles of social cohesion and solidarity promoted by Ubuntu and Asabiyya humanistic philosophies guide and enable more humane and 'collegial' technology-enhanced engagements, interactions and teaching. The shared purposes and common goals these theories combine also enhance ethical technology use and prioritise inclusive technology practices for student-centred learning, a major requirement for effective implementation of educational technology within and outside the classroom.

Overall, the Ubuntu and Asabiyya humanistic philosophies and the Yoruba and Zara Yacob epistemic strategies require significant student engagements with worthwhile problems or tasks, with the aim of arriving at warranted conclusions, useful solutions or artefacts. Along the process, technologies could play such multifaceted roles as supporting communication

and interaction between faculty and students, enabling access to subject matter content and general knowledge, and aiding the construction, validation and dissemination of meaning, knowledge and/or artefacts across the disciplines. Engagements of these sorts could empower students as they challenge and support students to acquire advanced skills and capabilities as well as deep understandings which could contribute towards their emancipation from all forms of domination and oppression. This ethical and multifaceted application of technology and the truly engaging and communicative activities aimed at generating new ideas or artefacts jointly define successful integration of technology in teaching and learning in HE in Africa.

CONCLUDING REMARKS

This study promotes the thesis that successful technology integration in teaching and learning in African HE demands faculty revisioning of their philosophy about humanity and knowledge. For improving the local relevance and significance of education, the revisioning needs to be underpinned by the philosophical, theoretical, conceptual and methodological thinking from within Africa. To contribute towards that end, we explored how Ubuntu and Asabiyya humane philosophies from Southern and Northern Africa could challenge the master–slave faculty–students relationships currently existing in African campuses. The principles and values promoted by Ubuntu and Asabiyya could trigger and drive the reconceptualisation of these types of relationships. Such values as inclusivity, empathy, engagement, participation, shared understanding and team spirit could support the adoption of more ethical and productive student–faculty relationships within technology-enhanced spaces in HE.

As teaching and learning in HE involve significant knowledge production, transfer and translation, we also drew on the empiricist and rationalist epistemologies of the Yoruba from Nigeria and Zara Yacob from Ethiopia. We consider empiricism and rationalism not as conflicting knowledge cultures but as alternative and complementary cultures to satisfactorily study phenomena. We promote the empiricist-rationalist continuum as a useful epistemological heuristic that could comfort disciplinary cultures. The empiricist-rationalist strategies we discussed in the above section jointly exhaust methodologies and theories faculty and students need to produce, transfer and translate knowledge and artefacts in technology-enhanced environments in HE in Africa. They could support student and faculty engagement and the development of critical thinking and problem-solving skills as well as teamwork and scientific communications which are evidently lacking from African campuses. These epistemological orientations coupled with Ubuntu and Asabiyya's humanistic philosophies could jointly trigger and drive faculty to adopt more engaging, empowering and emancipatory pedagogies as well as significant faculty and student agency. These deep and extensive reconceptualisations or reflections of faculty–student relationships and pedagogies could also be considered as innovative avenues for (faculty) professional learning and development.

In sum, adopting humanistic philosophies and empiricist-rationalist epistemological orientations to support technology integration in African HE could have the following significant implications. The purpose of education in such environments is to improve student capacities and skills for further learning, ensure full participation in practice communities within and outside HE, and promote and support self-actualisation. This necessitates the content of education or curriculum to primarily embody local philosophical, theoretical, conceptual and methodological thinking as well as emerging community needs and challenges. However, as universities claim to have spheres of influence at local, national, regional and global levels

(Bekele & Ofoyuru, 2021; Frondizi et al., 2019), curriculum should also consider content from those levels.

The method of education needs to also support the cultivation of student skills and capabilities as well as values and ethics highly needed in their communities and beyond. The epistemic strategies discussed above encourage significant faculty and student agency in education; debates about whether to adopt faculty-centred or student-centred education might not be relevant. Traditional pedagogies such as listening, intentional silence, observing, doing, conversing or engaging in formal and informal team works could be relevant and productive. Thus, both faculty and students have significant roles to play. Both empiricist and rationalist orientations mimic the logic of research or scientific study generally; teaching is more empowering if it is research based and driven. The role of faculty is thus to structure learning content and activity, create communities of practice, support and realise meaningful student participation/conversation and facilitate the development of the whole person.

These reconceptualisations of the purpose, content and method of education generally appear consistent with continental initiatives. As part of the struggle against European colonialism, Pan-Africanism was created to promote a spirit of brotherhood and collaboration among all people of Africa (Hodgson & Byfield, 2017). The AU and its member countries still invoke this movement to galvanise Africans around development and sustainability. The principles and values of Ubuntu and Asabiyya discussed above seem consistent with the tenets of Pan-Africanism. Moreover, as part of the 2063 vision, the AU vows to further develop local knowledge systems not only in education but also in society generally. To challenge oppressive pedagogies and colonial ideologies, there are also some decolonial efforts undergoing in academia in Southern Africa and elsewhere in the continent.

Drawing on the principles and values of the Yoruba and Zara Yacob indigenous epistemologies to envision technology-enhanced spaces could thus be considered complementary to and consistent with these continental aspirations. As indicated in the introduction section, technologies are viewed as communication tools (teaching and learning through technology), knowledge banks (teaching and learning from technology) and cognitive tools to think through (teaching and learning with technology). If properly contextualised and consistently practised, these proposed deconstructions of existing ideologies and discourses could significantly scaffold successful technology integration in teaching and learning in HE in Africa. The overall conclusion is that successful technology integration in teaching and learning requires strategic reform of university education in its entirety.

This embeddedness in local knowledge systems to support technology integration in HE in Africa is the unique and significant contribution of this study to the field. The philosophical strategies discussed in this paper could better inform educational policy making, instructional design, and actual teaching and learning using technologies. Faculty could, in consultation with instructional designers and students, experiment with these strategies in their courses and document contextual enablers and constraints of success for further theorisation and experimentation.

Several challenges or issues that could put to test the applicability of the proposed philosophical perspectives are briefly identified. International literature indicated that implementation or practice of (new) educational policy reform are mediated by such factors at the individual, institutional and national levels as 'smart policy design, inclusive stakeholder engagement, conducive context and a coherent implementation strategy' (Viennet & Pont, 2017, p. 3). Moreover, African HE is a colonial creation lacking local relevance (Assie-Lumumba, 2006; Cloete & Maassen, 2015; Dei et al., 2019) and is characterised by domineering faculty–student relationships and dictating pedagogies (Kom, 2005; Nhemachena & Mawere, 2022). Although Pan-Africanism and decolonial efforts underway in Africa as well as AU development strategies seem supportive environments, we conjecture that faculty and institutional inertia, rigid and dated curriculum, oppressive traditional pedagogies

and student assessment methods, limited faculty and student expertise in adopting more engaging and empowering pedagogies, large class size and digital divide (connected to technology infrastructure and Internet connectivity) could be considered among the major obstacles to employ the philosophical perspectives discussed in this study. Further research and theorisation on faculty and student interpretations and views of the proposed humanistic philosophical assumptions and empiricist-rationalist epistemological orientations as triggers and enablers of more engaging, empowering and emancipatory pedagogies is warranted.

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CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest related to the work in this manuscript.

DATA AVAILABILITY STATEMENT

The study does not involve empirical data. It is a philosophical interrogation of technology-enhanced teaching and learning in higher education in Africa.

ETHICS STATEMENT

This study did not involve human participants.

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REFERENCES

- Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?": ICT in Ghana post Covid-19. *Education and Information Technologies*, 26(2), 1665–1685. <https://doi.org/10.1007/s10639-020-10331-z>
- Akyol, A. (2018). Asabiyyah theory of Ibn Khaldun and its effects on education. *Turkish Studies*, 13(17), 37–48. <https://doi.org/10.7827/TurkishStudies.13558>
- Amponsah, S. (2023). Akan folklore as a philosophical framework for education in Ghana. *International Review of Education*, 69, 125–142. <https://doi.org/10.1007/s11159-023-09993-x>
- Amponsah, S., & Babarinde, K. (2022). The centrality of globalisation in sustaining development education in Ghana and Nigeria. In O. Kwabong, D. Addae, & J. Boateng (Eds.), *Reimagining development education in Africa* (pp. 75–88). Springer, Cham.
- Amponsah, S., Badu-Nyarko, S. K., Obodai, G. A. N. S., & Anane, P. (2019). Learning environments for supporting undergraduate online distance education students. In M. M. Van Wyk (Ed.), *Student support toward self-directed learning in open and distributed environments* (pp. 78–102). IGI Global.
- Andrews, R. (2011). Does e-learning require a new theory of learning? Some initial thoughts. *Journal for Educational Research Online Journal*, 3(1), 104–121.
- Arpa, H. I. (2021). *A neocolonial reading of J. M. Coetzee's waiting for the Barbarians and disgrace* [Unpublished doctoral dissertation]. Karabuk University.
- Assie-Lumumba, N. T. (2006). *Higher education in Africa: Crises, reforms and transformation* [A working Paper Series]. Centre for Development of Social Science Research in Africa.
- Badroen, R. T. (2015). The spirit of Ubuntu and Asabiyya. *Muslim Views Journal*, 29(3), 25–26.
- Balsvik, R. R. (2005). *Haile Selassie's students: The intellectual and social background to revolution 1952–1974*. Addis Ababa University Press.
- Başer, Z. (2012). *First year of English teaching in a rural context: A qualitative study at an elementary school in Turkey* [Master's thesis]. Middle East Technical University. <https://open.metu.edu.tr/handle/11511/22016>
- Bekele, T. A. (2009). *Learning impacts of technologies in higher education: Methodological and theoretical issues in and for research* [Unpublished doctoral dissertation]. University of Oslo.

- Bekele, T. A. (2010). Motivation and satisfaction impact of educational technologies: A review. *Educational Technology and Society*, 13(2), 116–127.
- Bekele, T. A. (2021). COVID-19 and prospect of online learning in higher education in Africa. *Journal of Comparative and International Higher Education*, 13(5), 241–251.
- Bekele, T. A., Cossa, J., & Barat, S. (2021). Toward building strategic international university-society partnerships in Africa. *Modern Africa: Politics, History and Society*, 9(2), 82–115.
- Bekele, T. A., Karkouti, I. M., & Amponsah, S. (2022). Core conceptual features of successful blended learning in higher education: Policy implications. *Education Policy Analysis Archives*, 30(156), 1–22. <https://doi.org/10.14507/epaa.30.7444>
- Bekele, T. A., & Menchaca, M. P. (2008). Research on internet-supported learning: A review. *Quarterly Review of Distance Education*, 9(4), 373–406.
- Bekele, T. A., & Ofoyuru, D. T. (2021). Emerging university-society engagements in Africa: An analysis of strategic plans. *Journal of Comparative and International Higher Education*, 13(1), 151–180.
- Belbase, S. (2011). *Radical versus social constructivism: Dilemma, dialogue, and defence*. Online submission.
- Cheng, C. Y., Li, Y., Varala, K., Bubert, J., Huang, J., Kim, G. J., Halim, J., Arp, J., Shih, H. J. S., Levinson, G., Park, S. H., Cho, H. Y., Moose, S. P., & Coruzzi, G. M. (2021). Evolutionarily informed machine learning enhances the power of predictive gene-to-phenotype relationships. *Nature Communications*, 12, 5627. <https://doi.org/10.1038/s41467-021-25893-w>
- Chikanda, N. E. (1990). Shared values and Ubuntu. In *Kontak Conference*, HSRC, Pretoria.
- Chuang, H. H. (2016). Leveraging CRT awareness in creating web-based projects through use of online collaborative learning for pre-service teachers. *Educational Technology Research Development*, 64(4), 857–876. <https://doi.org/10.1007/s11423-016-9438-5>
- Cloete, N., & Maassen, P. (2015). Role of universities and the African context. In N. Cloete, P. Maassen, & B. Tracey (Eds.), *Knowledge production and contradictory functions in African higher education* (pp. 1–17). African Minds.
- Connell, R. (2007). *Southern theory: The global dynamics of knowledge in social science*. Allen & Unwin.
- Connell, R. (2017). Southern theory and world universities. *Higher Education Research and Development*, 36(1), 4–15. <https://doi.org/10.1080/07294360.2017.1252311>
- Daniel, J., Kanwar, A., & Uvalić-Trumbić, S. (2009). Breaking higher education's iron triangle: Access, cost, and quality. *Change: The Magazine of Higher Learning*, 41(2), 30–35.
- Dei, D., Osei-Bonsu, R., & Amponsah, S. (2019). A philosophical outlook on Africa's higher education in the twenty-first century: Challenges and prospects. IntechOpen. <https://doi.org/10.5772/intechopen.86885>
- Faryadi, Q. (2015). An Islamic perspective of teaching philosophy: A personal justification. *IOSR Journal of Research and Method in Education*, 5(6), 49–60. <https://doi.org/10.9790/7388-05634960>
- Fomunyam, K. G. (2017). Decolonising the future in the untransformed present in South African higher education. *Perspectives in Education*, 35(2), 168–180.
- Fronzizi, R., Fantauzzi, C., Colasanti, N., & Fiorani, G. (2019). The evaluation of universities' third mission and intellectual capital: Theoretical analysis and application to Italy. *Sustainability*, 11(3455), 1–23.
- Garrison, D. R. (2011). *E-learning in the 21st century: A framework for research and practice*. Routledge.
- Gutema, B. (2013). Some thoughts on the African university. In B. Gutema & C. Verharen (Eds.), *African philosophy in Ethiopia: Ethiopian philosophical studies* (pp. 17–28). The Council for Research in Values and Philosophy.
- Hallen, B. (1998). Yoruba epistemology. In *Routledge Encyclopedia of Philosophy*. Routledge. <https://doi.org/10.4324/9780415249126-2005-1>
- Hallen, B. (2004). Contemporary anglophone African philosophy: A survey. In K. Wiredu (Ed.), *A companion to African philosophy* (pp. 99–143). Blackwell Publishing Ltd.
- Halverson, L. R., Graham, C. R., Spring, K. J., Drysdale, J. S., & Henrie, C. R. (2014). A thematic analysis of the most highly cited scholarship in the first decade of blended learning research. *Internet and Higher Education*, 20, 20–34. <https://doi.org/10.1016/j.iheduc.2013.09.004>
- Harasim, L. (2017). *Learning theory and online technologies*. Routledge.
- Haybano, A. K., Haley, A., Lindblad, S., & Wärvik, G. (2021). North-south collaboration: On the making of a Center for Comparative Education and Policy Studies at Addis Ababa. *Nordic Journal of Comparative and International Education*, 5(3), 36–52.
- Herrington, J., & Parker, J. (2013). Emerging technologies as cognitive tools for authentic learning. *British Journal of Educational Technology*, 44(4), 607–615. <https://doi.org/10.1111/bjet.12048>
- Hill, J. R., Wiley, D., Nelson, L. M., & Han, S. (2004). Exploring research on internet-based learning: From infrastructure to interactions. In H. D. Jonassen (Ed.), *Handbook of research on educational communications and technology* (pp. 433–460). Lawrence Erlbaum.
- Hodgson, D., & Byfield, J. (Eds.). (2017). *Global Africa: Into the twenty-first century* (Vol. 2). University of California Press.
- Johnson, R. D., Hornikb, S., & Salas, E. (2008). An empirical examination of factors contributing to the creation of successful e-learning environments. *International Journal of Human-Computer Studies*, 66(5), 356–369. <https://doi.org/10.1016/j.ijhcs.2007.11.003>

- Jonassen, D. H., & Reeves, T. C. (1996). Learning with technology: Using computers as cognitive tools. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 693–719). Simon & Schuster Macmillan.
- Khan, B. H. (2010). The global e-learning framework. In S. Mishra (Ed.), *E-learning stride handbook* (8th ed., pp. 42–51). Indira Gandhi National Open University.
- Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: What is “enhanced” and how do we know? A critical literature review. *Learning, Media and Technology*, 39(1), 6–36. <https://doi.org/10.1080/17439884.2013.770404>
- Koetting, J. R., & Malisa, M. (2004). Philosophy, research, and education. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology* (2nd ed., pp. 1009–1020). Lawrence Erlbaum Associates.
- Kom, A. (2005). Redesigning the African university: Emerging from subalternity. *CODESRIA Bulletin*, (1-2), 4–8.
- Letseka, M. (2013). Educating for *Ubuntu/botho*: Lessons from Basotho indigenous education. *Open Journal of Philosophy*, 3(2), 337–344.
- Lim, C. P., & Wang, T. (2016). A framework and self-assessment tool for building the capacity of higher education institutions for blended learning. In C. P. Lim & T. Wang (Eds.), *Blended learning for quality higher education: Selected case studies on implementation from Asia-Pacific* (pp. 1–22). UNESCO.
- Lo, M. (2016). Islam and the idea of the “African university”: An analytic framework. In M. Lo & M. Haron (Eds.), *Muslim institutions of higher education in postcolonial Africa* (pp. 13–41). Palgrave Macmillan.
- Makhudu, N. (1993). Cultivating a climate of co-operation through Ubuntu. *Enterprise Magazine*, 48, 40–42.
- Margulieux, L. E., McCracken, W. M., & Catrambone, R. (2016). A taxonomy to define courses that mix face-to-face and online learning. *Educational Research Review*, 19, 104–118. <https://doi.org/10.1016/j.edurev.2016.07.001>
- Martin, D. J., & Loomis, K. S. (2013). *Building teachers: A constructivist approach to introducing education*. Cengage Learning.
- Mautner, T. (2005). *The penguin dictionary of philosophy* (2nd ed.). Penguin Books.
- Mayaki, I. S. (2019). *Africa's critical choices: A call for a pan-African roadmap*. Routledge.
- Menon, D. M. (2022). *Changing theory: Concepts from the global south*. Routledge.
- Meyer, J. W. (2009). Reflections: Institutional theory and world society. In G. Kruecken & G. Drori (Eds.), *World society: The writings of John W. Meyer* (pp. 36–63). Oxford University Press.
- Meyer, J. W. (2010). World society, institutional theories, and the actor. *Annual Review of Sociology*, 36, 1–20.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Mohammed, D., Aini, Q., Supriyanti, D., Sulistiawati, S., & Anggraeni, M. (2021). Assimilate the Qur'an's view with science and technology perspectives. *Aptisi Transactions on Technopreneurship*, 3(1), 42–47. <https://doi.org/10.34306/att.v3i1.141>
- Morgan, K. (2014). Technology integration in multicultural settings. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 867–871). Springer.
- Nhemachena, A., & Mawere, M. (2022). Academics with clay feet? Anthropological perspectives on academic freedom in twenty-first century African universities. *Journal of African American Studies*, 26, 142–165. <https://doi.org/10.1007/s12111-022-09584-4>
- Ofuasia, E., & Ojo, O. G. (2016). On the Gettier problem and Yorùbá ‘epistemology’: Analytic forays into ethno-philosophy. *Philosophia: E-Journal of Philosophy and Culture*, 14, 146–165.
- Ojha, M., & Rahman, M. A. (2021). Do online courses provide an equal educational value compared to in-person classroom teaching? Evidence from U.S. survey data using quantile regression. *Education Policy Analysis Archives*, 29(85), 1–21. <https://doi.org/10.14507/epaa.29.5919>
- Oplatka, I. (2019). *Reforming education in developing countries: From neoliberalism to communitarianism*. Routledge.
- Paul, R. W., & Elder, L. (2008). *The miniature guide to critical thinking: Concepts and tools*. The Foundation for Critical Thinking.
- Pinchin, C. (2005). *Issues in philosophy: An introduction* (2nd ed.). Palgrave Macmillan.
- Rampa, S. H., & Mphahlele, L. K. (2016). Supporting open distance learning (ODL) students through Ubuntu values. In M. Letseka (Ed.), *Open distance learning (ODL) through the philosophy of Ubuntu* (pp. 119–132). Nova Science Publishers.
- Sattar, E. (2017). *Cognitive learning and its relationship with online education*. <https://www.td.org/insights/cognitive-learning-and-its-relationship-with-online-education>
- Scaratti, G., Galuppo, L., Gorli, M., Gozzoli, C., & Ripamonti, S. (2017). The social relevance and social impact of knowledge and knowing. *Management Learning*, 48(1), 57–64.
- Schalkwyk, F. (2015). University engagement as interconnectedness: Indicators and insights. In N. Cloete, P. Maassen, & B. Tracey (Eds.), *Knowledge production and contradictory functions in African higher education* (pp. 203–229). African Minds.

- Shea, P. (2007). Towards a conceptual framework for learning in blended environments. In A. G. Picciano & C. D. Dziuban (Eds.), *Blended learning: Research perspectives* (pp. 19–35). Sloan Consortium.
- Shea, P., & Bidjerano, T. (2010). Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of communities of inquiry in online and blended learning environments. *Computers & Education*, 55(4), 1721–1731. <https://doi.org/10.1016/j.compedu.2010.07.017>
- Shihade, M. (2022). Asabiyya. In D. M. Menon (Ed.), *Changing theory: Concepts from the global south* (pp. 169–180). Routledge.
- Sumer, B. (2012). Ibn Khaldun's Asabiyya for social cohesion. *Electronic Journal of Social Sciences*, 11(41), 253–267.
- Sumner, C. (1978). *The treatise of Zera Yacob and of Walda Heywat: An analysis*. Commercial Printing Press.
- Sumner, C. (2004). The light and the shadow: Zera Yacob and Walda Heywat: Two Ethiopian philosophers of the seventeenth century. In K. Wiredu (Ed.), *A companion to African philosophy* (pp. 172–182). Blackwell Publishing Ltd.
- Sunhaji, A. (2018). The integration of science-technology and living environment through Islam religion education learning at Adiwiyata-based junior high School in Banyumas Regency. *DINAMIKA ILMU*, 18(2), 179–193. <https://doi.org/10.21093/di.v18i2.1179>
- Teferra, D. (2021). *African higher education after COVID: The bane and the boon*. University World News. <https://www.universityworldnews.com/post.php?story=20210614212209304>
- Teodros, K. (1996). Claude Sumner's classical Ethiopian philosophy. *Northeast African Studies*, 3(2), 39–52.
- Teodros, K. (2004). Zera Yacob and traditional Ethiopian philosophy. In K. Wiredu (Ed.), *A companion to African philosophy* (pp. 183–190). Blackwell Publishing Ltd.
- Verharen, C. C. (2013). Philosophy and the future of African universities: Ethics and imagination. In B. Gutema & C. Verharen (Eds.), *African philosophy in Ethiopia: Ethiopian philosophical studies* (pp. 9–14). The Council for Research in Values and Philosophy.
- Viennet, R., & Pont, B. (2017). *Education policy implementation: A literature review and proposed framework* [OECD Education Working Paper Series No. 162]. OECD.
- Wagner, N., Hassanein, K., & Head, M. (2008). Who is responsible for E-learning success in higher education? A stakeholders' analysis. *Educational Technology & Society*, 11(3), 26–36.
- Wang, Y., Han, X., & Yang, J. (2015). Revisiting the blended learning literature: Using a complex adaptive systems framework. *Educational Technology & Society*, 18(2), 380–393.
- Wiredu, K. (2004). Introduction: African philosophy in our time. In K. Wiredu (Ed.), *A companion to African philosophy* (pp. 1–27). Blackwell Publishing Ltd.
- Wong, L., Tatnall, A., & Burgess, S. (2014). A framework for investigating blended learning effectiveness. *Education + Training*, 56(2/3), 233–251. <https://doi.org/10.1108/ET-04-2013-0049>
- Woodley, X., Hernandez, C., Parra, J., & Negash, B. (2017). Celebrating difference: Best practices in culturally responsive teaching online. *TechTrends*, 61, 470–478. <https://doi.org/10.1007/s11528-017-0207-z>
- Zireva, D. (2016). Ubuntu values in an African university. In L. Moeketsi (Ed.), *Open distance learning (ODL) through the philosophy of Ubuntu* (pp. 17–30). Nova Science Publishers.

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