Advancing knowledge sharing and information literacy in African HEIs: challenges, innovations and future directions

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Digitisation and knowledge sharing are crucial for improving information access, teaching, and processing in academia, transforming the operations of higher education institutions (HEIs). In Africa, information literacy (IL) plays a vital role in supporting academic, research and administrative functions, especially as technological advancements redefine information access and sharing. IL is increasingly essential for students, faculty, and staff across HEIs, driving institutions to develop professional skills, enhance research, foster innovation, and encourage collaboration in the knowledge economy. This study used a systematic review approach to examine IL challenges and innovations in African HEIs, drawing data from e-journals, peer-reviewed books, and resource articles. An extensive exploratory search was conducted across Google Scholar and Scopus in relation to the topic. Technology Acceptance Model (TAM) was adopted for this study. The study highlighted a critical gap: the absence of a unified framework that merges traditional KS with digital practices. This underscores the need for a balanced approach, where traditional methods are complemented, not replaced, by digital solutions, enhancing accessibility, knowledge storage and productivity. The study recommends steps to strengthen digital literacy, KS encourage cross-continental collaboration and establishes a resilient IL foundation responsive to global educational demands.

Keywords: Digitisation, Higher education institutions (HEIs), Knowledge sharing, Information literacy, Africa

1 Introduction

Technological advancements have revolutionised the information landscape, transforming how knowledge is accessed and shared (Sewe 2016); Bultmann et al. 2005. Digitisation, especially in research, has emerged as a key driver of change, with global initiatives like the Google Book Project and Carnegie Mellon Million Book Project exemplifying large-scale efforts to improve information access (Dougherty 2010 Sharma 2012). However, successful digitisation extends beyond technology, requiring effective project management, financial planning, staff coordination and institutional support (Lopatin 2006; Mendelsson et al. 2014. Digitalisation has become essential for advancing knowledge sharing (KS) in higher education institutions (HEIs), addressing challenges in fulfilling educational mandates, particularly in developing countries (Mbatha et al. 2011; Alabi & Mutula 2020). It fosters interconnectedness, reshaping knowledge access and sharing while enhancing skills development and research capacities in HEIs, contributing to the global knowledge economy (Njiraine 2019; Okioga et al. 2014.

However, African HEIs face barriers such as limited research accessibility, inadequate teaching environments and underdeveloped KS practices (World Bank 2017). Despite these challenges, digitalisation projects are transforming institutional collections, strategic planning, and service delivery (Bandi 2015), with faculty leveraging digital tools to improve access amidst funding and technological constraints (Perry 2005;). Knowledge sharing (KS) is critical for improving HEI efficiency and fostering effective knowledge management and learning networks. Yet, KS remains underutilised due to limited digitalisation and human resource support, with motivational and cultural factors also playing a role (Makori 2015; Ramady 2005). Information literacy (IL) complements KS by empowering academic communities to effectively access, evaluate and use information, addressing the unique infrastructural and resource challenges of African HEIs (UNESCO, 2017). Emerging technologies provide potential solutions for IL adoption, but successful implementation depends on understanding African HEIs' specific contexts, underscoring IL's role in fostering globally competitive academic environments (Eke 2011; Patrix 2018). This study aimed to explore the challenges, innovations, and future directions in advancing knowledge sharing and information literacy within HEIs.

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2 Research problem

The advancement of KS and IL in African HEIs is significantly impeded by infrastructural, technological, and policy-related challenges. Insufficient funding, unreliable access to information resources and the lack of integrated IL programmes undermines KS efforts in African universities (Nkomo & Motlhabane 2023). Okiy (2022 notes that despite the recognised value of KS, there is a notable absence of institutional support for collaborative learning initiatives and access to academic resources, indicating an urgent need for research into sustainable KS frameworks that reflect the unique economic, technological, and social landscapes of these institutions. IL programmes are essential for equipping students with the skills to access, evaluate and apply information efficiently. However, many African HEIs have not fully integrated IL into their curricula, limiting students' preparedness for the complex information landscape of a globalised workforce (Chisita 2023; Ling et al. 2009).

Chitanana and Chisango (2023) highlight that students often lack critical information analysis skills due to limited exposure to structured IL training, emphasising the need for culturally relevant IL frameworks aligned with African students' educational contexts (Edegbo & Ugwoke 2021). Additionally, inadequate ICT infrastructure poses a major challenge to accessing digital resources and implementing online KS platforms in African HEIs. Outdated technology and limited internet bandwidth hinder the ability of students and faculty to effectively access and share information. Research by Boadi and Asamoah (2022) indicates that these infrastructure deficits exacerbate the digital divide in higher education across the continent. The challenge, therefore, extends beyond providing access to information; it also involves building resilient infrastructures that facilitate synchronous and asynchronous knowledge exchange (Makgahlela & Tlabela, 2021). Addressing these challenges necessitates targeted research to develop scalable IL programmes and establish policies that foster a KS culture within African HEIs. Recent regional initiatives in East Africa demonstrate the potential of collaborative KS models to reduce costs and increase access, although they remain largely in the pilot stages (Mutemeri 2023). This highlights the need to explore how such frameworks can be sustainably scaled and adapted to various HEI contexts across Africa (Matsika et al. 2023). The central research problem, therefore, was to identify effective methods and frameworks for advancing KS and IL in African HEIs amidst ongoing infrastructural, technological and policy challenges. Bridging these gaps would enhance students' academic experiences and better prepare them for a competitive, information-driven global workforce (Edewor & Oyekanmi 2022).

3 Scope of the study

This study focused exploring the challenges and innovations in advancing KS and IL in HEIs, particularly addressing infrastructural limitations, digital divides, and varying levels of IL proficiency among students and faculty (World Bank 2017; UNESCO 2017). It also investigated future directions for integrating digital tools and strategies to enhance KS and IL, fostering a culture of collaboration and innovation across African HEIs (Olatoye, Nekhwevha & Muchaonyerwa 2020).

4 Theoretical framework

The Technology Acceptance Model (TAM) has been extensively validated in Western contexts, but its relevance in diverse cultural settings, such as African educational institutions, requires adaptations to reflect local beliefs, technological infrastructure, and social norms. Research indicates that cultural factors significantly influence users' perceptions of technology, particularly perceived usefulness, and ease of use (Straub et al. 1997). In African HEIs, communal learning values and collective KS play a crucial role in shaping technology acceptance (Badu & Markwei 2022). Therefore, TAM constructs may need adjustments to prioritise collaborative KS practices over individual benefits (Tan 2021). In many African HEIs, the adoption of technology is affected by socio-economic factors like limited funding, ICT infrastructure gaps and varying levels of digital literacy (Chisita 2023).

This has led researchers to incorporate contextual variables into TAM to enhance its predictive capacity regarding technology acceptance. For instance, in low-resource settings, facilitating conditions such as reliable internet access and institutional support are key influences on the adoption of digital tools (Alabi & Mutula 2020). This adaptation suggests that technology acceptance in African HEIs is less about individual perceptions of ease and utility and more about the availability of supportive infrastructure and consistent access to digital resources (Boadi & Asamoah 2022). Demographic factors, including age, gender, and educational background, also impact technology acceptance in African contexts, often shaped by social norms or expectations surrounding technology use. As Venkatesh, Morris, Davis, and Davis (2003) propose, cultural adaptation of TAM should include social influence as a mediating factor, acknowledging community-based perceptions that can affect an individual's decision to engage with new technology. Thus, in African HEIs, technology acceptance may be influenced not only by an individual's perceived usefulness of a tool but also by its acceptance and usage among peers and educators within their community.

In recent years, TAM has been widely applied to assess digital literacy adoption in educational settings, particularly where digital literacy is an emerging focus. Studies show that initiatives such as e-learning platforms and digital libraries often use TAM constructs to evaluate their acceptance among students and faculty (Dixit 2018). In African HEIs, digital literacy plays a crucial role in supporting KS, as skills for locating, evaluating and using information are fundamental for academic collaboration and success (Nkomo & Motlhabane 2023). Research has expanded TAM by incorporating additional constructs like perceived behavioural control and attitudes toward KS, providing a more comprehensive perspective on digital tool usage (Davis & Venkatesh 2004; Granić 2019). For instance, Chitanana and Chisango (2023) applied TAM in Zimbabwean universities to study online learning management system (LMS) usage, finding that perceived ease of use significantly influenced students' willingness to engage in online collaborative learning. This highlights the importance of designing culturally relevant and user-friendly digital tools, particularly in regions with limited digital infrastructure. Similarly, Mutemeri (2023) used TAM in Kenya to assess the adoption of digital KS platforms, revealing that institutional support and perceived ease of sharing academic content were key factors in student acceptance. This aligns with Venkatesh and Bala's (2008) TAM extension, which includes perceived enjoyment as a critical acceptance factor. Applying this construct to digital literacy initiatives for KS demonstrates how perceived enjoyment can enhance engagement, emphasising TAM's adaptability in measuring user satisfaction with educational digital tools.

Recent advancements have also integrated TAM with the Unified Theory of Acceptance and Use of Technology (UTAUT) in African HEIs. This combined TAM-UTAUT model incorporates constructs such as social influence and performance expectancy, offering deeper insights into the acceptance of digital literacy tools, especially in communal contexts where shared expectations significantly impact technology adoption (Alghamdi & Beloff 2021). The extended model has been particularly effective in understanding faculty attitudes towards adopting digital tools for KS, acknowledging that faculty motivations often differ from those of students (Mutula 2020). These developments illustrate TAM's flexibility and relevance in advancing digital literacy and KS in African HEIs.

TAM demonstrates significant adaptability within African HEIs, effectively accounting for diverse cultural and infrastructural needs. In East Africa, TAM has been applied to mobile learning (m-learning) adoption, with Mtega et al. (2022) finding that affordability and ease of use in mobile devices enhance acceptance, particularly where high-quality content is crucial in areas with limited internet. In Southern Africa, TAM has guided digital literacy programmes' integration. Nkuna and Matsebula (2023) highlight institutional support, like workshops, as key for rural campus adoption, emphasising the model's flexibility by incorporating local needs such as technical support. In West Africa, TAM has analysed KMS adoption, where Babalola and Fapohunda (2021) noted that user-friendly designs improve ease of use, especially when accessibility and affordability factors are added. In North Africa, TAM has supported blended learning adoption, as shown by Elbadawi (2023, who introduced "perceived relevance" at the University of Cairo, underscoring the model's effectiveness in linking digital tools with academic success. These regional adaptations showcase TAM's capacity to enhance technology engagement in Africa's HEIs, tailoring adoption strategies to meet local challenges and improve KS and IL.

4.1 Implications of the TAM for advancing KS and IL

The TAM adaptations TAM demonstrate its versatility and relevance in supporting digital literacy initiatives within the African context. Examining factors beyond individual perceptions, TAM's extended constructs can help identify strategies to foster a digital literacy culture in HEIs. This is crucial in environments where ICT literacy is essential for academic success, yet technology adoption is often inconsistent due to infrastructural and socio-cultural constraints (Edegbo & Ugwoke 2021). Modifying TAM to reflect communal learning practices and local attitudes towards digital KS can enhance the design of effective KS platforms, enabling students and faculty to overcome barriers to digital literacy and fostering a more interconnected academic community. The successful adaptation of TAM within KS frameworks across various regions highlights its potential to guide digital literacy initiatives that address local needs and constraints. Incorporating region-specific factors, African HEIs can strengthen their culture of KS and ICT literacy, ultimately bridging the digital divide. Moreover, TAM's application in KS frameworks aids in identifying institutional and cultural elements that promote the collective use of digital resources, thereby facilitating academic collaboration and improving learning outcomes across African HEIs.

The regional applications of TAM reinforce its value as a theoretical model for studying technology acceptance while underscoring its adaptability in advancing digital literacy and KS initiatives. Integrating TAM with local cultural, infrastructural, and social variables, HEIs can create more effective, inclusive digital environments that enhance learning and KS practices. This adaptability across diverse cultural settings, along with its recent applications in digital literacy initiatives, underscores TAM's ongoing relevance for studying technology adoption in African HEIs. Incorporating additional constructs to accommodate socio-economic and cultural factors, TAM provides a robust framework for understanding the dynamics of KS and IL in educational contexts where digital literacy is still evolving (Davis & Venkatesh 2004; Granić 2019).

5 Literature review

The integration of KS and IL in HEIs plays a pivotal role in fostering academic excellence, enhancing collaboration, and driving sustainable institutional growth. KS involves tools, methods and techniques that facilitate capturing, storing, and disseminating knowledge, forming a key component of effective knowledge management in HEIs (Hong et al 2012; Twum-Darko 2015). IL complements these efforts by equipping students, faculty, and staff with the skills to locate, evaluate and use information effectively in decision-making and problem-solving (UNESCO 2017). Together, KS and IL create an environment where information flows freely, supporting academic success and operational efficiency. In African HEIs, KS is gaining importance as institutions increasingly value organised, accessible information to improve learning and research outcomes. Despite this, barriers such as limited digital literacy, insufficient training and cultural challenges hinder effective implementation (Ghobadi 2012 Hackett 2000). IL complements KS by leveraging digital libraries and institutional repositories to enhance research quality and academic performance.

Social media and online learning environments facilitate collaborative KS, supporting IL goals through content exchange and peer learning (Biasutti & El-Deghaidy 2015). While technology aids KS, its integration into HEI operations and curricula remains limited, reducing its potential impact (Hackett 2000; Biasutti & El-Deghaidy 2015). Systematic KS management improves access to quality knowledge and fosters information exchange (Sulisworo 2012; Venkitachalam 2012; Pérez-Luño 2019. KS is critical for boosting institutional performance with digital technologies like mobile platforms expanding resource access in underserved areas (Bhardwaj & Walia 2012). Additionally, digital repositories and partnerships with international HEIs broaden IL, fostering academic development and connecting African HEIs to global networks (Enakrire & Ocholla 2017).

5.1 The benefits of KS and IL in HEIs

The role of KS and IL in HEIs is crucial for academic progress, enhanced service delivery and the development of innovative practices (Adeniran 2011; Naicker 2017; Rafique 2020). KS enables HEIs to meet user needs, facilitate access to essential products and ensure efficient knowledge dissemination (Tahleho 2016; Adedokun-Shittu & Shittu 2013). It plays a critical role in the administration and operational efficiency of HEIs, supporting decision-making processes and promoting institutional growth (Kulkarni & Deshpande 2012; Izu 2020). The growing demand for digitalisation further amplifies the need for timely access to information and efficient service delivery in academic environments (Anna & Puspitasari 2013; Pistilli & Arnold 2010). KS is widely recognised as a key driver of academic progress in HEIs. Research suggests that academic growth depends on effective KS practices, which support teaching, learning and research activities (Muchaonyerwa, 2015; Olatoye et al. 2020). Fostering an environment where knowledge is shared among faculty, students, and administrators, HEIs can achieve enhanced service delivery, higher productivity and improved academic outcomes (AlRashdi & Srinivas 2016; Adeniran 2011; Ismail & Yusof 2009; Arif & Alsuraihi 2012). Furthermore, IL plays a pivotal role in ensuring that stakeholders within HEIs can access, evaluate, and apply information effectively.

Through IL, academic staff and students acquire skills to navigate complex information environments, critically assess information sources and apply knowledge to real-world challenges (UNESCO 2017). KS and IL are also instrumental in developing quality and diverse knowledge that drives innovation within HEIs. Institutions gain relevant knowledge through academic duties, networking, library websites and the internet, which support decision-making and enhance knowledge diversity (Chipeta 2018; Anna & Puspitasari 2013). Sharing intellectual resources and research outputs promotes efficient academic operations and facilitates training of well-prepared academic staff (Tahleho 2016). Additionally, IL ensures that the knowledge shared within HEIs is accurate, credible, and actionable, as users are equipped with skills to assess information quality before dissemination (UNESCO 2017). Retaining institutional knowledge is also a critical benefit of KS and IL. When academic staff retire or leave HEIs, there is a risk of knowledge loss, which can negatively impact academic service delivery (Muchaonyerwa 2015; Agarwal 2015). Embedding KS and IL practices, institutions can prevent "brain drain" by preserving and transferring essential knowledge to future generations of scholars and academic staff. This process is facilitated through conferences, seminars, and the preservation of research findings, ensuring that institutional knowledge is not lost but instead archived and made accessible for future reference (Tahleho 2016). Moreover, KS and IL foster a culture of innovation and collaboration within HEIs. Promoting the exchange of new knowledge and ensuring that information is accessible to all stakeholders, institutions can stimulate creativity and encourage the development of innovative solutions (Ajegbomogun & Diyaolu 2018). IL complements these efforts by enabling users to identify knowledge gaps, seek relevant information and apply it effectively.

Addressing barriers such as inadequate infrastructure, limited technology access and unequal access to digital resources is essential to strengthening KS and IL in African HEIs (World Bank 2017; Njoku 2015). Enhanced infrastructure and digital access ensure that KS platforms and IL initiatives are inclusive and accessible to all academic community members. The integration of KS and IL in HEIs supports effective service delivery, improved academic performance and

the development of a collaborative, innovative academic environment. Embedding IL into KS initiatives, HEIs can ensure that students, faculty and administrators are well-equipped to access, evaluate and apply information. This, in turn, drives innovation, fosters lifelong learning, and supports sustainable academic growth in African HEIs (UNESCO 2017; World Bank 2017).

5.2 Advancing KS and IL in Africa HEIS

Advancing KS and IL in African HEIs addresses significant challenges related to inadequate infrastructure, limited access to technology and varying digital literacy levels among students and faculty (World Bank 2017). KS plays a vital role in enhancing academic service delivery and fostering innovation, as it allows faculty, staff and students to share knowledge effectively, contributing to academic growth and improved decision-making (Chipeta 2018; Agarwal & Islam 2015; Potocnik, Košir & Devetak 2016; Dikotla 2016; Khan 2019). KS strategies, such as codification and personalisation, are essential for advancing IL within academic communities. Codification, which involves organising knowledge through digital tools to create accessible repositories, is particularly beneficial in African HEIs for improving IL by making knowledge readily available and usable (Johansson, Moehler & Vahidi, 2013; Agarwal & Islam 2015; UNESCO 2017; Rafique 2020). On the other hand, personalisation focuses on interpersonal interactions like mentoring to foster trust and tacit KS, which is crucial in overcoming cultural barriers to KS in African contexts (Nazim & Mukherjee 2012; Muchaonyerwa 2015; Olatoye et al. 2020).

The integration of both strategies enables African HEIs to enhance their KS and IL initiatives, fostering a competitive academic environment supporting innovation and preparing students and faculty for the digital information landscape challenges (World Bank 2017; Njoku 2015). Digital tools play a central role in facilitating KS and IL by transforming how knowledge is accessed, shared, and communicated among academics. Technologies such as email, intranets and social media enable real-time communication and collaboration, bridging gaps in infrastructure and allowing HEIs to establish digital repositories for research findings, lecture notes and administrative documents (Izu 2020; Johansson et al. 2013; Rafique 2020). This digital infrastructure not only supports KS but also enhances IL by providing platforms for students and faculty to develop their skills in navigating and utilising information effectively (Panahi et al. 2013 UNESCO 2017). Digital tools such as online databases and LMS facilitate self-directed learning and collaborative KS, reducing dependence on physical resources and ensuring sustainable knowledge management (Enakrire & Ocholla 2017). Codification and personalisation are crucial for fostering effective KS in African HEIs. The codification strategy involves converting knowledge into digital formats, which can be stored in repositories for easy retrieval.

This is essential in African HEIs, as it turns individual knowledge into institutional memory, accessible to all stakeholders (UNESCO 2017; Rafique 2020). In contrast, the personalisation strategy focuses on sharing tacit knowledge through human interactions and mentoring, which is particularly relevant in the culturally rich and relationship-based environments of African HEIs. While digital tools support personalisation by enhancing online collaboration and discussions, challenges such as competition and reluctance to share knowledge due to power dynamics remain (Muchaonyerwa 2015; Olatoye et al. 2020). Addressing these cultural barriers and promoting trust among faculty and students are essential for fostering a supportive environment for KS. Combining both codification and personalisation strategies, with the support of digital tools, allows African HEIs to build a culture of collaboration, trust, and innovation, ultimately advancing both KS and IL across the continent.

5.3 Challenges and innovation of KS and IL

African HEIs face significant challenges in promoting effective KS and IL due to infrastructural, human, and systemic barriers. Limited access to high-speed internet, digital resources and training on IL tools affects the capacity of many HEIs, particularly in sub-Saharan Africa, where constrained budgets hinder investment in modern educational technology (Njiraine 2019; Alabi & Mutula 2020). The disparity between urban and rural HEIs is particularly stark, as rural institutions experience more challenges related to internet connectivity, resource availability and access to IL tools (Balarabe & Fari 2018; Adedokun-Shittu & Shittu 2013). Another major challenge is the absence of standardised IL curricula across African HEIs, which leaves students graduating with varying levels of IL proficiency, limiting their capacity to navigate the digital information landscape. Additionally, resource constraints hinder access to digital tools, e-resources, and technological support services essential for IL and KS initiatives (Okiki 2012 AlRashdi & Srinivas 2016; Ghazali 2016). The resignation or retirement of experienced academic staff exacerbates the problem, resulting in the loss of valuable tacit knowledge, especially where effective KS management systems are lacking (Twum-Darko 2015; Njiraine 2019; Al-Kurdi, El-Haddadeh & Eldabi 2020). Institutional restrictions, heavy workloads and fear of industrial strikes further impede KS, as some academic staff are reluctant to share knowledge due to fears of losing influence or being overwhelmed by additional responsibilities (Hatala 2009).

The human dimension of KS and IL is equally critical, as it relies on collaboration, motivation, and mutual trust. Effective KS requires a positive relationship between knowledge providers and seekers, and a supportive organisational culture that encourages sharing (Haas 2015; Rafiq & Ameen 2013; Ali & Khan 2017). The lack of institutional support, clear incentives, and formalised processes for knowledge transfer reduces the willingness of staff to engage in KS (Bhardwaj & Walia 2012). Furthermore, knowledge retention is hindered by recipients limited absorptive capacity, as those who lack sufficient intellectual capacity may struggle to benefit from shared knowledge (Chang 2012 Adedokun-Shittu & Shittu 2013). This is particularly relevant for IL, as students and staff require foundational ICT skills to fully engage with digital resources and apply information effectively (Tella et al. 2018). The management of tacit knowledge flows between older and younger academic staff also poses a challenge, especially in areas related to IL, where mentorship and guidance are essential for transferring expertise (Shen 2016 To address these challenges, HEIs are adopting innovative strategies to foster KS and enhance IL. Digitalisation has been a key driver, transforming traditional educational practices and supporting the integration of IL into curricula (Rafiq & Ameen 2013; Ojukwu 2020). Initiatives such as digital libraries, open educational resources (OERs) and LMS facilitate the sharing of resources and improve access to IL training materials. These platforms provide students and faculty with diverse information sources, enabling them to acquire essential IL skills and participate in collaborative learning (UNESCO 2017).

Embedding IL training into academic curricula ensures that students graduate with the competencies required to navigate the digital information landscape (UNESCO 2017. Moreover, collaborative learning models are being adopted, where librarians, faculty and students co-create knowledge and participate in training workshops, seminars, and research projects (World Bank 2017; Njoku 2015). This participatory approach strengthens KS and IL by fostering lifelong learning, promoting innovation, and enhancing academic performance. Reward systems that incentivise KS and recognise contributions to organisational learning motivate staff and students to engage in KS and IL initiatives (Zhang, Chen & Gong 2017; Kankanhalli et al. 2005). However, the success of KS and IL initiatives requires more than technological infrastructure; it demands effective collaboration, trust, and efficient processes (Ghobadi 2012; Akturan 2016). HEIs must prioritise policies that support a culture of KS and provide structured incentives for participation (Bhardwaj & Walia 2012). Identifying and addressing these barriers will help policymakers and HEIs target critical areas for improvement, including infrastructure development, digital literacy programmes and faculty ICT training to strengthen KS and IL in African HEIs (Martin & Zahrndt 2015; Okiki 2012; Anna & Puspitasari 2013).

6 Research methodology

This systematic review investigated KS and IL in African HEIs by systematically gathering, appraising, and synthesising relevant evidence. The information sources used in this study included e-journals, peer-reviewed books, and resource articles. An extensive exploratory search was conducted across Google Scholar and Scopus abstracts in relation to the topic (Alabi & Mutula 2020). The search addressed the study’s aim (Njoku 2015; Petticrew & Roberts 2006). A thematic bibliometric review was conducted, organising studies into primary themes and clusters such as "knowledge-sharing practices," "information literacy" and "challenges and innovation." (Higgins et al. 2011. The thematic bibliometric review revealed that core themes in the literature, such as digitalisation, KS practices and IL challenges, remain central to current research. Clustering studies into conceptual groups allowed for an in-depth look at how these themes evolve, with studies on “digitalisation in HEIs” frequently focusing on digital tools and platforms used to enhance KS among students and faculty (UNESCO 2017). The research design implemented: inclusion and exclusion adopted for the process, based on predefined criteria, focusing on studies published within the last ten years relevant to African HEIs and consist of empirical studies, meta-analyses and case studies. Ensuring the quality and reliability of included studies is essential for generating valid, evidence-based conclusions in systematic reviews.

This process involves evaluating the methodological rigour, relevance and trustworthiness of studies using structured appraisal tools like the Critical Appraisal Skills Programme (CASP) and the Cochrane Risk of Bias (RoB) Tool, each serving a distinct role. The CASP tool assesses the quality of qualitative and mixed methods studies by examining key aspects such as research design, sample adequacy, data collection methods, ethical considerations, and researcher reflexivity. It determines whether the data support the study’s conclusions and whether the study is relevant to the aim. Meanwhile, the Cochrane RoB Tool is designed to assess bias in randomised controlled trials (RCTs) and evaluates six key domains of bias: selection, performance, detection, attrition, reporting and other potential biases. Using a colour-coded system (green, yellow, or red), researchers classify the level of bias for each domain, helping them decide whether to include or exclude a study from the systematic review. Coding plays a central role in quality assurance, facilitating the systematic classification and synthesis of this study's characteristics and quality ratings.

During data extraction, researchers assign specific labels or "codes" (e.g., "Low Risk," "High Risk," or "Some Concerns") to the quality indicators identified through CASP or Cochrane RoB. This process allows for the categorisation of extracted information according to quality domains, enabling researchers to visualise and track patterns in study quality.

Coding also supports data synthesis by summarising quality ratings across multiple studies, helping to identify trends in bias or methodological flaws such as technology acceptance, KS enablers and digital literacy. This structured approach ensures transparency, efficiency, and reproducibility in the review process. Incorporating CASP, Cochrane RoB and coding practices in the systematic reviews maintains methodological rigour, ensuring only high-quality studies are included in evidence synthesis, thereby supporting robust and reliable findings.

7 Discussion and findings

The citation analysis highlights significant contributions to KS and IL, with key works emphasising frameworks like the TAM for understanding technology adoption and digital literacy in African HEIs (Davis & Venkatesh 2004). Trends reveal a shift from traditional IL practices to digital-focused approaches, reflecting technological advancements and the growing importance of digital repositories and mobile literacy (Njoku 2015). Increasing interest in KS platforms and IL training programmes addresses infrastructural challenges prevalent in African HEIs (World Bank, 2017). Research trends show collaborative efforts between African and international scholars through co-authorship networks, highlighting an exchange of knowledge critical for sustainable KS and IL practices.

Keyword co-occurrence maps reveal a focus on terms like “digital literacy,” “knowledge sharing” and “Africa,” emphasising core research interests and gaps in exploring technology's role in academic development. Key journals stand out for their regional relevance, providing vital insights into African HEIs’ needs. Conferences and regional publications further contribute to addressing African educational challenges, offering a contextually informed perspective aligned with the socio-economic and infrastructural realities of African HEIs (Enakrire & Ocholla 2017; Agarwal & Islam 2015).

7.1 Future directions: KS and IL in Africa HEIS

KS and IL are essential for promoting academic excellence and innovation in African HEIs, influenced by regional social, economic, and technological factors (Enakrire & Ocholla 2017; Adomi 2019). Strengthening KS and IL requires the adoption of emerging technologies, such as AI, big data, and cloud computing, which can enhance access to academic resources and facilitate collaboration, though their successful integration depends on infrastructure investments, training and addressing regional challenges (World Bank 2017; Ameen 2019; Carlsson 2008). Comprehensive digital literacy programmes are crucial for developing advanced skills like data analysis and online communication while addressing ethical issues, including intellectual property rights (UNESCO 2017; Adeniran 2011; Olatoye et al. 2020). Institutional policies prioritising open-access resources and encouraging faculty contributions to collaborative research are necessary to build a resilient academic community (Njoku 2015; Dikotla 2016; Paulin 2015). Collaborative efforts through interdisciplinary and inter-institutional partnerships, which support resource sharing, joint research, and digital repositories, are vital, especially for smaller HEIs (Nazim & Mukherjee 2012; Agarwal & Islam 2015; Arif & Alsuraihi 2012). Expanding OERs aligns with UNESCO’s vision and supports lL by providing accessible content, which is particularly valuable in resource-constrained settings (UNESCO 2017; Bhagwati 2012).

Furthermore, sustainable, and eco-friendly digital infrastructure, backed by government collaboration, is essential for enabling KS activities (Bhardwaj & Walia 2012; Tahleho 2016). Ongoing faculty development in KS and IL is critical for sustainability, ensuring educators are equipped to guide students effectively and stay updated on technological advancements (Sirorei 2017; World Bank 2017). Integrating emerging technologies, robust policies, and continuous professional development, African HEIs can create a resilient framework for KS and IL that fosters societal development and prepares students and faculty for the global knowledge economy (Njoku 2015; Muchaonyerwa 2015). Continued investment in KS and IL is essential for enhancing information access, digital inclusion, and educational equity across Africa, ultimately overcoming challenges and fostering a culture of collaboration and innovation in African HEIs (Carlsson 2008; Enakrire & Ocholla 2017; World Bank 2017).

8 Conclusion and recommendations

To advance KS and IL in African HEIs, a holistic strategy is essential, combining sustainable infrastructure, digital literacy, supportive policies, and innovative technologies. HEIs should prioritise investing in reliable digital infrastructure and renewable energy to improve connectivity and bridge the digital divide. Digital literacy initiatives should provide faculty and students with advanced skills, while institutional policies should support open access, promote collaborative research, and encourage community engagement. Inter-institutional and interdisciplinary partnerships can further enhance resource sharing and innovation. Emerging technologies like AI and cloud computing offer scalable solutions for personalised learning and knowledge access, although successful implementation requires collaboration with tech providers who understand the local context.

Job rotations and faculty development programmes can foster KS among staff, while access to OERs can expand educational opportunities in resource-constrained environments. Adopting a future-ready KS and IL framework that integrates infrastructure, policy, and innovation, African HEIs can foster an inclusive academic environment that meets global standards and contributes to societal development and educational equity across the continent.

To advance KS and IL in African HEIs, a holistic strategy is essential, combining sustainable infrastructure, digital literacy, supportive policies, and innovative technologies. HEIs should prioritise investing in reliable digital infrastructure and renewable energy to improve connectivity and bridge the digital divide. Digital literacy initiatives should provide faculty and students with advanced skills, while institutional policies should support open access, promote collaborative research, and encourage community engagement. Inter-institutional and interdisciplinary partnerships can further enhance resource sharing and innovation. Emerging technologies like AI and cloud computing offer scalable solutions for personal learning and knowledge access, though successful implementation requires collaboration with tech providers who understand the local context. Job rotations and faculty development programmes can foster KS among staff, while access to OERs can expand educational opportunities in resource-constrained environments. Adopting a future-ready KS and IL framework that integrates infrastructure, policy, and innovation, African HEIs can foster an inclusive academic environment that meets global standards and contributes to societal development and educational equity across the continent.

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