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From Quiet Pilot to Campus Backbone: A Critical Reflection on a Decade of the Sakai Learning Management System Journey at the University of Ghana

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Abstract

In the 2014/2015 academic year, the University of Ghana replaced the Knowledge Environment for Web-based Learning (KEWL) with the Sakai Learning Management System (LMS), an open-source platform sustained under the Apereo Foundation. Over a decade, what began as a modest pilot within the distance education programme of the School of Continuing and Distance Education (SCDE) evolved into the digital backbone of teaching, learning, assessment, and academic continuity across the entire University. This lead article, written by the co-chairs of the Sakai@10 Anniversary Conference held at the University of Ghana on 19–20 August 2025, frames this special edition of the Multidisciplinary Journal of Distance Education Studies (MJDES) but it does so with critical scrutiny rather than celebration.

The article examines the decade (2014/2015-2025) through three analytical lenses: adoption versus institutionalization, the equity paradox of digital transformation, and governance's persistent lag behind technology. It traces the shift from KEWL to Sakai, assesses the platform's effects on

curriculum, pedagogy, and assessment, and weighs these developments against evidence of limited tool use, declining post-pandemic engagement, and infrastructural constraints. It also revisits the COVID-19 "lifeline" narrative by distinguishing emergency remote teaching from designed online learning. The article then confronts the defining development of the platform's second decade: the generative Artificial Intelligence (GenAI) turn. Drawing on a recent PRISMA-guided systematic review of 246 studies on the ethical integration of GenAI in higher education (Yarboi, et al; 2026), the article argues that Ghanaian higher education risks repeating the KEWL-to-Sakai pattern, whereby adoption outpaces governance, training, and equity. It therefore calls for the early development of ethical integration strategies, context-sensitive governance mechanisms, and African-centred frameworks. The article concludes by briefly assessing the University's *Policy on the Use of Artificial Intelligence* (April 2026) in relation to these priorities.

Keywords: *Sakai LMS; digital learning; distance education; open-source platforms; higher education; emergency remote teaching; generative artificial intelligence; ethical integration; AI policy; governance; Ghana*

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Introduction

Universities rarely go digital overnight, and they almost never go digital smoothly. Like many institutions of higher education, the University of Ghana arrived at its present state of digital maturity in stages: through pilot projects, pockets of experimentation within its distance and continuing education programmes, formal adoption for blended learning, and then a sudden, institution-wide reliance during a global health crisis that exposed both the strengths of its chosen platform and the limits of its digital infrastructure. At the centre of that journey stands the Sakai Learning Management System (LMS), an open-source platform that has grown, over ten years, from a quiet pilot into the backbone of the University's teaching and learning fabric.

This special edition of the *Multidisciplinary Journal of Distance Education Studies* (MJDES) is dedicated to that decade-long journey. It emerges directly from the Sakai@10 Anniversary

Conference, a two-day blended international conference hosted by the School of Continuing and Distance Education (SCDE) of the College of Education, University of Ghana, at the Cedi Conference Centre on 19–20 August 2025, under the theme ‘Digital Learning: Reflecting on a Decade of the Sakai LMS Journey at the University of Ghana.’ The conference brought together faculty, students, instructional technologists, administrators, and international partners, including the Keynote Speaker, Dr. Wilma Hodges, the Sakai Community Manager who led the technical team that installed the platform in April 2014, to assess what a decade of Sakai has meant and where the next decade should lead.

Anniversaries invite celebration, and there is much to celebrate. But an anniversary that produces only celebration squanders its scholarly value. As co-chairs of the conference and guest editors of this edition, we have therefore chosen to read the decade through three analytical lenses that recur, sometimes uncomfortably, across the evidence assembled here. The first is the gap between adoption and institutionalisation: acquiring and deploying a platform is not the same as embedding it in pedagogy, policy, and organisational routine, and much of the evidence in this edition suggests that at the University of Ghana the breadth of adoption has outpaced the depth of integration. The second is the equity paradox of digital transformation: technologies introduced to democratise access can simultaneously stratify it, by bandwidth, device, data cost, digital literacy, language, and disability, unless equity is treated as a design principle rather than an afterthought. The third is the governance lag: at every stage of this narrative, from KEWL through Sakai to the present generative Artificial Intelligence (GenAI) moment, technology has moved faster than the institutional frameworks meant to govern it, and the costs of that lag have been borne unevenly. These analytical lenses provide the framework for the discussion that follows.

The article proceeds in three movements. First, we chronicle the institutional history from KEWL to Sakai, reading it not merely as a success story but as a case study in the conditions under which technology adoption succeeds or fails in African higher education. Second, we assess the platform’s pedagogical and institutional impact including its decisive role during COVID-19 against the countervailing evidence of uneven use, post-crisis declines, and infrastructural constraint that the conference itself surfaced. Third, we turn to the question that will define the next decade: the ethical integration of generative AI. Here we draw on a recent systematic review of 246 studies (Yarboi et al., 2026), asking what a decade of LMS experience teaches about how, and how not to absorb the next wave of educational technology, and briefly appraising the University’s newly adopted Policy on the Use of Artificial Intelligence (University of Ghana, 2026) in that light.

The Genesis: From KEWL to Sakai

The University of Ghana's first experiment with technology-mediated distance learning dates to 1997, using the African Virtual University infrastructure on a small scale. A more deliberate turn came in 2004, when the late Professor Mumuni Dakubu, then Head of ICT Services, introduced KEWL, a web-based learning management system developed at the University of the Western Cape, South Africa, and released under an open-source (GNU) license. KEWL's subsequent failure to take root deserves more analytical attention than it usually receives, because it contained the seeds of many of the challenges that followed. The platform's content creation, communication, and assessment tools offered limited scope for instructor creativity and student interaction; but the deeper problems were institutional, not technical. Patronage of KEWL remained poor because of deficient ICT infrastructure, inadequate training for lecturers, and the absence of a support ecosystem findings corroborated empirically by Dadzie (2009), whose study of teaching staff found low adoption driven by infrastructural deficiency, lack of training, and poor integration of e-library services. The lesson, visible already in 2009, was that educational technology fails not primarily because of its feature set but because of the institutional conditions around it. That lesson would have to be relearned, on a scale, more than once.

A significant turning point occurred in August 2011 at the Distance Education and Teacher Education in Africa (DETA) Conference hosted by Eduardo Mondlane University in Maputo, Mozambique. There, during a workshop on Open Educational Resources, Professor Martin Dwomoh-Tweneboah of Linfield University, Oregon, USA introduced the first author to Sakai, highlighting its robustness, flexibility, and long-term sustainability as an open-source platform. What followed and what distinguished the Sakai adoption from the KEWL episode was a disciplined, evidence-driven pilot. Using a TrySakai account hosted by Longsight, Inc., demonstration and customised course sites were run at the Institute of Continuing and Distance Education (ICDE) between 2011 and 2013, including blended delivery of a core postgraduate course, *Contemporary Issues in Adult Education*, with favourable evaluation by students, staff, and faculty.

It is worth being candid, however, about how contingent the eventual adoption was. Three conditions converged. First, a policy entrepreneur: a senior academic with prior Blackboard experience and instructional design training from California State University, positioned as Director of ICDE, who could carry the case through the University's decision structures. Second, an evidence base: about three years of documented piloting that could withstand scrutiny. Third, and most importantly, the migration was facilitated by a favourable funding environment. The

University of Ghana-Unisplendour Software Systems (Tsinghua University) ICT-Based Distance Education Project (“Chinese Phase 2”), a US\$37.59 million initiative supported by loans and grants from the Government of the People’s Republic of China, provided the necessary financial backing. After the University delegation headed by the first author attended the Sakai Global Conference in San Diego in June 2013, the Project Management Team endorsed the adoption of Sakai as the University’s LMS, replacing KEWL.

In April 2014, the University of Ghana installed and commissioned the Sakai Learning Management System (LMS) at the Korea Information Access Centre in the Balme Library, with Dr Wilma Hodges leading the technical implementation and training team. The platform became fully operational during the 2014/2015 academic year. The transition, however, was contingent on the convergence of the three enabling factors discussed above. Had any one of these factors been absent, the University might have continued using the KEWL platform for a considerably longer period. This experience demonstrates that technology adoption in resource-constrained universities is shaped not only by the availability of technology but also by institutional leadership, technical capacity, and funding opportunities. It further suggests that the circumstances that facilitated the University of Ghana's transition from KEWL to Sakai may not necessarily apply to subsequent waves of educational technology adoption.

The Sakai project at the University has since survived four Vice-Chancellors and four Registrars, and it has required the collective efforts of numerous stakeholders to sustain it. With gratitude, we remember those who served the project and have since passed on among them Professor Mumuni Dakubu, Mr. Reuben Aggor, Dr. Samuel Kofi Badu-Nyarko, Professor Elom Dovlo, and Dr. Samuel Somuah as well as the many colleagues, technologists, and support staff whose largely unseen labour kept the platform alive.

The Sakai Project in Global Context

The University of Ghana’s adoption placed it within a distinctive global movement. Sakai originated in 2003/2004 as a collaboration among the University of Michigan, Indiana University, the Massachusetts Institute of Technology, and Stanford University, funded by a US\$2.3 million Andrew W. Mellon Foundation grant, to build an open-source alternative to commercial LMSs. Its architecture evolved from Michigan’s CompreHensive collaborativE Framework (CHEF), its name playfully honouring both that acronym and Hiroyuki Sakai of the television programme *Iron Chef*. Governance passed in 2012 to the Apereo Foundation, and as Dr. Hodges recounted in her keynote, the platform has moved through more than two decades of releases from Sakai 1.0 in

2004, through the landmark Sakai 10 of 2014 (the year of the University's adoption), to Sakai 25, with deep Microsoft 365 integration and expanded language support.

Two aspects of this history are particularly significant for African institutions adopting learning management systems. First, Sakai remains the only major LMS that can be hosted and managed entirely on an institution's own servers. This characteristic has become increasingly important as data sovereignty has emerged as a central concern in African digital policy, a trend reflected in the African Union's *Continental Artificial Intelligence Strategy* (2024). In this context, self-hosting is more than a technical option. It provides institutions with greater control over student data, enables adaptation to local requirements, and reduces dependence on vendor pricing structures and policy changes. The second aspect is more cautionary. Sakai represents a relatively small and contested segment of the global LMS market, and its community-source model relies on the continued participation and contributions of member institutions. Openness, therefore, should not be understood as an automatic guarantee of sustainability. Rather, as several contributions to this edition suggest, it encompasses varying degrees of accessibility, adaptability, interoperability, and community governance. The extent to which these benefits are realised depends on the availability of infrastructure, human capacity, and institutional policy support.

Over the past decade, the University of Ghana has benefited substantially from participation in the Sakai community. The next decade, however, raises a different question: whether the University will move beyond being a beneficiary to becoming an active contributor through software development, research, and the documentation of African use cases. This remains an important issue for the future development of the platform and its relevance within African higher education.

Institutional Integration and Pedagogical Transformation and Its Limits

In its early years, Sakai's use was concentrated in ICDE and subsequently SCDE and its regional learning centres, connecting distance learners across Ghana to tutors in Accra and beyond modest in scale but revolutionary in intent. By the mid-2010s, faculties across disciplines were integrating the platform into teaching, and since the COVID-19 pandemic Sakai has been the official LMS of the entire University. At the level of practice, the transformation has been real. Structured course sites allow a semester's content to be mapped coherently; the Lessons tool supports guided learning paths; discussion forums extend dialogue beyond the class period and give quieter students a stage; wikis and e-portfolios turn group projects into genuine co-creation; and the assessment suite: Tests & Quizzes, Assignments, Rubrics, Gradebook supports authentic assessment as, for, and of learning. Empirical work within the University confirms these

affordances: Attiogbe et al; (2025) found that feedback strategies and an embedded course syllabus bear a significant relationship to learning improvement among distance learners on the Sakai platform.

The migration from KEWL was also accompanied by deliberate curriculum development, the Master of Arts in Distance Education and E-Learning [DEEL] (2012), the doctoral course ADLT 704: *Educational Technology and Innovation*, and a generation of M.Phil and Ph.D. theses on digital pedagogy whose authors now hold academic and administrative positions across Ghana's universities. This mentorship pipeline has produced a sustained stream of publications on faculty acceptance and use of LMSs (Asamoah et al., 2024), lecturers' willingness or reluctance to embrace them (Asamoah & Oheneba-Sakyi, 2024), demand- and supply-side analyses of Sakai and Moodle in developing countries (Asamoah, 2020), adult learners' experiences of using Sakai LMS (Biney, 2020), and graduate students' knowledge of the platform (Sahoo et al., 2023).

Examining the Impact Claims Critically

A candid appraisal, however, must resist the narrative of unbroken triumph and the conference itself, to its credit, supplied the countervailing evidence. Decade-long survey data presented at Sakai@10 show that faculty use concentrates on a narrow band of tools, principally announcements and assignments, with the platform's richer interactive resources seldom exploited; the 'backbone' is, for many courses, a noticeboard. Studies of first-year undergraduates reveal digital-skills deficits and reliance on peers rather than structured onboarding. Graduate students' knowledge of the platform's features has been found to be low, with gender disparities in that knowledge (Sahoo et al., 2023) a finding that should trouble an institution committed to inclusive digital transformation. The plenary panel highlighted several serious challenges with the University's Learning Management System (LMS). Although the institution operates eight servers with a theoretical capacity to support about 3,500 concurrent users, the system is routinely overloaded during assessment periods. Infrastructure limitations are also evident, with only 550 computer workstations available to serve the entire student population. Participants further noted persistent difficulties with Turnitin integration, while some faculty members continue to resist or avoid using the platform altogether. Research comparing public and private universities reveals a similar pattern: students appreciate the convenience of having learning materials and resources centralized within the LMS, but they are dissatisfied with the limited interaction available in many courses. As a result, many students turn to WhatsApp and other social media platforms for meaningful communication and collaboration that the LMS is intended but often fails to facilitate.

The analytical point is not that these deficits negate the achievement; it is that they specify its character. What the decade produced is broad, shallow adoption resting on a committed core of deep users concentrated in SCDE, the department repeatedly identified in this edition's contributions as the most proficient user community. Adoption, in other words, has not yet matured into institutionalisation: into the routine, university-wide, pedagogically ambitious use that the platform's affordances permit and its rhetoric implies. Existing research on LMS adoption offers a useful lens for interpreting these findings. Although perceived usefulness and ease of use influence users' willingness to engage with technology, facilitating conditions, including infrastructure, training opportunities, workload support, and institutional culture, often determine the extent of sustained adoption (Asamoah & Oheneba-Sakyi, 2024; Asamoah et al., 2024). Where such enabling conditions are inadequate, meaningful engagement with the LMS is likely to remain limited. This is the KEWL lesson returning in milder form, and it frames everything that follows.

COVID-19: Lifeline, Stress Test, and Cautionary Tale

March 2020 remains the hinge of this story. The COVID-19 pandemic closed lecture halls almost overnight, transforming Sakai from a useful teaching tool into the University's academic lifeline. Within weeks, thousands of courses migrated online. Lecturers learned to upload teaching materials, design online assessments, and combine synchronous teaching tools with Sakai's asynchronous learning environment. Students logged in from living rooms, shared computers, and mobile phones, connecting from Accra, Tamale, and communities across Ghana. Through this rapid transition, academic life continued. Degrees were completed, research activities persisted, and teaching was sustained under unprecedented circumstances. This achievement should not be underestimated. Sakai's impact also extended beyond the University's own programmes. In April 2020, the Pan-African Doctoral Academy (PADA) used the platform to host a virtual seminar. This was followed by a three-week faculty training programme in October 2020 and its first Virtual Doctoral School in November 2020. These initiatives brought together participants from universities in Albania, Ghana, Kenya, Mali, Nigeria, South Africa, Uganda, and Zimbabwe. At the height of the global crisis, Sakai became more than a learning management system; it served as an instrument of international collaboration and Pan-African academic solidarity.

Yet analytical honesty requires two important qualifications. First, a conceptual distinction must be made. What the University achieved in 2020 was *emergency remote teaching*, not deliberately designed online learning. Hodges et al., (2020) introduced this distinction to prevent crisis-driven instructional improvisation from being mistaken for well-planned digital education. The University's rapid response demonstrated that the technological platform was available and that

teaching could continue under extraordinary circumstances. However, it did not by itself demonstrate the pedagogical quality, sustainability, or institutional maturity associated with established online learning systems. Second, the empirical evidence suggests that the gains achieved during the crisis were not fully sustained. Data presented at the conference by the University's Academic Quality Assurance Unit shows that non-use of core Sakai tools increased from 32.7% of courses in 2020/2021 to 49% in 2021/2022. At the same time, only half of uploaded course syllabi met compliance standards. These figures indicate that much of the adoption observed during the pandemic was driven by necessity rather than by lasting institutional transformation.

The pattern is revealing. The pandemic produced a sharp surge in technology use because participation was effectively compulsory. Once those pressures eased, engagement with key digital tools began to decline. In other words, the University demonstrated remarkable resilience during the crisis, but resilience born of improvisation proved difficult to sustain. This is the central lesson of the pandemic period. If digital learning is to become a durable institutional capability rather than a temporary emergency response, it must be embedded in structures, policies, and routines. The conference's recommendations for systematic digital orientation, stronger policy enforcement, and real-time monitoring should therefore be understood not as administrative afterthoughts but as the essential mechanisms through which emergency adaptation can be converted into lasting institutional capacity.

The Sakai@10 Conference and This Special Edition

It was against this backdrop that the School of Continuing and Distance Education (SCDE) convened the **Sakai@10 Anniversary Conference** to document, celebrate, and critically interrogate the University of Ghana's "Sakai story." The conference was formally opened with a welcome address delivered on behalf of the Provost of the College of Education and was chaired on behalf of the Vice-Chancellor, Professor Nana Aba Appiah Amfo. In remarks presented on her behalf, the Vice-Chancellor observed that Sakai had become woven into the very fabric of teaching, learning, and connectedness within the University.

The programme brought together multiple perspectives on the platform's development and impact. It featured a lead presentation on the conference theme, delivered by the first author from an insider's perspective that drew on his direct involvement in the planning, implementation, management, and institutionalisation of Sakai at the University of Ghana. The presentation traced the platform's evolution over the decade, reflected on key strategic decisions and implementation

challenges, and assessed its contribution to teaching and learning across the University. A keynote address was delivered by Dr. Wilma Hodges, who reflected on the history, evolution, and future of the global Sakai project. Participants also engaged in a plenary panel discussion that brought together the voices of faculty members, students, and administrators. To deepen discussion and reflection, the conference further organised a series of concurrent breakout sessions around six thematic areas:

- *Evolution and impact of LMSs in higher education;*
- *Faculty and student experiences with LMSs;*
- *Open-source platforms and the future of learning in higher education;*
- *Accessibility, equity, and inclusion in Sakai implementation;*
- *Integrating artificial intelligence and emerging tools with LMSs; and*
- *The role of LMSs in emergency remote teaching and learning.*

The papers in this special edition originated as presentations delivered across the conference's six sub-themes and were subsequently refined through the journal's peer-review process. Reflecting MJDES's multidisciplinary mission, the collection encompasses a wide range of methodological approaches, including quantitative, qualitative, mixed-methods, systematic-review, and reflective-collaborative studies. A methodological caveat should be acknowledged at the outset. Much of the research on Sakai at the University of Ghana, including the historical account presented in this article, has been produced by individuals who have been directly involved in the platform's development, implementation, or management. Such proximity provides valuable access to institutional knowledge, historical detail, and operational realities that might otherwise remain undocumented. At the same time, it carries the risk of confirmation bias and favourable interpretation. Recognising this limitation strengthens rather than weakens the case for future research. It highlights the need for more independent, comparative, and longitudinal studies capable of evaluating Sakai's impact from perspectives beyond those of its principal advocates and implementers. With this caveat in view, we now synthesise the principal themes that emerge from the contributions to this special edition.

Emerging Themes from a Decade of Practice and Research

From Rejection to Reliance and Partial Relapse

Several contributions trace Sakai's trajectory from initial apprehension driven by data costs, navigation difficulty, and inadequate training to indispensability during COVID-19, and then to the partial relapse documented in the post-pandemic monitoring data. Discipline-specific studies add texture: language learners in Swahili, Arabic, and Spanish preferred Sakai-based examinations for their accessibility and navigability, while identifying missing special-language characters,

technical glitches, data costs, and invigilator unfamiliarity as obstacles requiring targeted customisation. Theoretically informed research drawing on technology affordances and constraints and new institutional perspectives suggests that stakeholders' experiences with a Learning Management System (LMS) are influenced not only by the technology itself but also by the institutional environment in which it is used. Institutional norms, practices, and expectations shape how users engage with the LMS. This perspective helps explain why the same LMS software can produce markedly different outcomes across departments within the same university.

Faculty and Student Experiences

The lived experiences of stakeholders point to a consistent conclusion: the major barriers to realizing the full educational value of the Learning Management System (LMS) are no longer primarily technological but organizational. Faculty members frequently describe Sakai as a valuable tool for course planning and managing large student enrolments. However, many acknowledge that they use only a limited portion of its available features. Similarly, students recognize the platform's contribution to learning but report challenges such as inconsistent course design, uneven lecturer engagement, and limited mobile accessibility. Administrators have taken steps to support adoption through structured and tiered training programs that have reached more than 300 faculty members. Despite these efforts, several challenges remain unresolved, including inadequate server capacity, concerns about academic integrity in online assessments, and resistance to change among some staff members. These experiences mirror findings from previous studies, which show that LMS adoption is encouraged by factors such as perceived usefulness, ease of use, and adequate facilitating conditions. At the same time, adoption and effective utilization are often constrained by heavy workloads, infrastructure limitations, and gaps in training and support (Asamoah & Oheneba-Sakyi, 2024; Asamoah et al., 2024).

Collectively, the evidence suggests that technological improvements alone are unlikely to produce substantial gains. To unlock the full potential of the platform, investments in the LMS must be accompanied by comparable investments in people, institutional policies, capacity building, and organizational change.

How Open is Open?

A third cluster of studies critically examines the concept of *openness*, which forms the foundation of Sakai and other open-source learning platforms. These contributions argue that openness should not be understood as a simple binary condition. Rather, it exists on a spectrum encompassing dimensions such as accessibility, adaptability, interoperability, equity, sustainability, and

community governance. The literature further demonstrates that, particularly in low-resource contexts, the benefits of open-source platforms are not guaranteed. Instead, the realization of openness depends heavily on supporting conditions, including adequate infrastructure, human capacity, and enabling policy frameworks. Case studies from both public and private universities in Ghana reveal several persistent constraints, including unreliable internet connectivity, high bandwidth costs, limited access to digital devices, shortages of technical maintenance expertise, and inconsistent institutional policy support.

These findings carry important implications. They challenge a common assumption within open-source advocacy that freedom from licensing costs automatically translates into greater educational access and opportunity. The evidence suggests otherwise. While open-source platforms may remove financial and legal barriers associated with proprietary software, they do not automatically eliminate structural and institutional obstacles to participation. Openness, therefore, should be viewed not as an inherent property of a platform but as an outcome that must be actively created and sustained through investment, governance, capacity building, and supportive policies. Where these conditions are absent, the practical benefits of openness remain limited, and an open-source platform can become as exclusionary in its effects as a proprietary alternative.

Accessibility, Equity, and Digital Inclusion

A recurring theme across literature is that educational technology should serve to bridge, rather than widen, the digital divide (Warschauer, 2003; van Dijk, 2020; Adarkwah, 2021). However, the evidence suggests that this outcome does not occur automatically. Instead, it depends on deliberate institutional efforts to ensure equitable access and participation. The studies (Adarkwah, 2021; Darko-Adjei & Ankrah, 2020; Sahoo et al., 2023) reviewed identify several factors that continue to contribute to digital inequality within Ghanaian universities. These include economic barriers that limit access to devices and connectivity, disparities in technological infrastructure, gender differences in LMS awareness and usage, and variations in digital proficiency across academic departments. The literature also highlights the socio-cultural dimensions of LMS adoption, an area that remains insufficiently explored despite its potential influence on technology acceptance and use.

Research on e-capacity building further reveals significant gaps in the institutional capabilities required to support effective digital learning (Aczel et al., 2008; Awidi & Cooper, 2015). Deficiencies have been reported in instructional design, content production, learner support, and community-building capacities. In particular, studies (Anane & Adusei, 2024; Awidi & Cooper,

2015) point to a shortage of instructional design technologists, raising concerns about whether existing human resources are sufficient to support the University's digital learning ambitions. The literature (Anane & Adusei, 2024) also draws attention to the equity implications of institutional policies governing LMS access. One notable example is the linkage of platform access to fee payment requirements. Such policies raise important questions about who is able to participate fully in online learning and under what conditions. Unlike technological limitations, these are matters of institutional governance and policy choice.

Taken together, these findings suggest that digital inclusion is not determined by technology alone. Rather, it is shaped by a combination of economic, social, organizational, and policy factors. Addressing the digital divide therefore requires not only technological provision but also sustained investment in capacity building, equitable policies, and inclusive institutional practices.

LMSs in Emergency Remote Teaching

Finally, several contributions revisit the COVID-19 crisis period with the benefit of hindsight. A systematic review of LMS adoption across African universities, informed by Moore's (1993) Theory of Transactional Distance, concludes that much of the pandemic-era literature focused on technological deployment and access. While these issues were understandably urgent during the crisis, they often overshadowed deeper pedagogical concerns, including learner autonomy, meaningful dialogue, and institutional coherence. The post-pandemic monitoring studies discussed earlier provide an important extension to this analysis. They show that emergency-driven adoption can achieve rapid uptake of digital learning technologies, but the gains are often difficult to sustain when implementation is not accompanied by pedagogical redesign, capacity building, and effective governance structures. In many cases, initial enthusiasm and usage decline once the immediate crisis has passed.

Across the studies reviewed, a clear pattern emerges: digital education cannot be evaluated solely in terms of access, participation rates, or technology deployment. Instead, its long-term success depends on the quality of teaching and learning experiences it supports, as well as the institutional systems that sustain them. This shift in emphasis reframes digital education in Africa from a technology- and access-centred agenda to a more pedagogically and institutionally grounded research programme. It is precisely this broader and more critical perspective that this special edition seeks to advance.

The Generative AI Turn: The Evidence Base and Its Warning

The emergence of generative artificial intelligence (GenAI) represents the most consequential development confronting the University's digital learning environment today. Recognising its growing significance, a recent PRISMA-guided systematic review conducted by a University of Ghana research team, including the present author, examined 246 studies on the ethical integration of GenAI in higher education (Yarboi et al., 2026). The review provides both a valuable evidence base and a cautionary message for institutions seeking to adopt AI responsibly. The study identified five recurring and interconnected ethical domains. The most frequently discussed was academic integrity and authenticity, appearing in 89% of the reviewed studies. This was followed by privacy, bias, and data governance (73%); equity, access, and inclusion (71%); AI literacy, human agency, and pedagogical redesign (69%); and transparency, accountability, and explainability (67%). Taken together, these findings suggest that the ethical integration of GenAI cannot be reduced to concerns about student misconduct or cheating. Rather, it is a systemic challenge involving assessment design, pedagogy, institutional capacity, data governance, and educational equity. This broader interpretation is one that the present article both endorses and extends.

Three findings from the review are particularly relevant to the University of Ghana. The first concerns the limited representativeness of the global evidence base. African contexts accounted for only 11.4% of the studies reviewed, while Ghana represented just 2.8%, equivalent to seven studies (Yarboi et al., 2026). As a result, many of the ethical frameworks, policy models, and governance approaches currently shaping international discussions have been developed primarily within contexts characterised by stronger infrastructure, more mature regulatory environments, and largely Anglophone educational systems. These conditions differ substantially from those found in many Ghanaian universities. Consequently, importing such frameworks without adaptation risks repeating a familiar mistake: applying externally developed solutions without sufficient consideration of local realities. The University avoided this error when adopting Sakai through a carefully managed pilot process; a similar approach will be necessary for AI governance.

The second finding relates to institutional preparedness. The review revealed a significant governance gap within Ghanaian higher education. Only 14% of the institutional contexts examined possessed comprehensive GenAI policy frameworks, and none had established structured faculty AI training programmes or formal mechanisms for reviewing AI-related practices. This contrasts sharply with policy coverage levels of between 78% and 82% reported in North America and Europe. The review characterises this situation as one of *governance*

vulnerability, whereby AI adoption proceeds largely through individual experimentation rather than institutionally coordinated and accountable implementation.

The third finding concerns equity and inclusion. Although GenAI has the potential to democratise academic support by providing feedback, explanations, tutoring assistance, and language support, these benefits are unevenly distributed in practice. Access often depends on reliable internet connectivity, adequate devices, premium subscription services, and levels of digital literacy. Existing evidence from Ghana indicates significant digital-literacy gaps among students (Nkansah & Oldac, 2024) as well as uneven awareness and understanding of GenAI among academics (Adarkwah et al., 2023). These disparities raise concerns that AI could reinforce rather than reduce existing educational inequalities.

The review further highlights a troubling tension between equity and academic integrity. Some of the AI-supported learning practices most beneficial to disadvantaged students may conflict with integrity frameworks developed in very different educational contexts. This concern is amplified by evidence showing that AI-generated text detection tools can exhibit bias against non-native English writers (Liang et al., 2023). For a multilingual African university, reliance on such tools as a governance solution could unintentionally disadvantage the very students who stand to benefit most from AI-enabled support.

When viewed against the historical trajectory outlined in this lead paper for the Special Edition, a striking pattern emerges. KEWL was introduced before the infrastructure, training, and support systems necessary for effective use were in place, and the initiative ultimately failed. Sakai's implementation was more successful because it followed a carefully piloted and evidence-informed adoption process. Nevertheless, the platform was not accompanied by sustained investments in governance, capacity building, and institutional support sufficient to transform adoption into deep institutionalisation. As a result, engagement remained widespread but often superficial, declining in contexts where usage was no longer actively required.

GenAI now appears to be following a similar path, though at a much faster pace and with significantly higher stakes. Unlike previous technologies, AI is arriving through students' smartphones, personal devices, and freely available online tools rather than through formal procurement and institutional deployment processes. At the same time, the systematic review characterises the broader higher education sector as having limited AI governance structures. In effect, universities may be entering a third cycle of technological adoption without fully addressing the lessons of the previous two.

The stakes are higher because GenAI reaches directly into the core functions of higher education. Unlike an LMS, which primarily supports the organisation and delivery of learning, GenAI raises fundamental questions about authorship, assessment validity, knowledge production, and the integrity of academic credentials. The pace of adoption is also unprecedented. No infrastructure project, procurement process, or commissioning ceremony is required; AI tools are already embedded in students' and lecturers' everyday digital environments.

The central lesson of the Sakai decade is therefore highly relevant to the present moment. Technology alone does not produce meaningful educational transformation. Without governance, capacity building, training, and deliberate attention to equity, adoption tends to remain shallow, uneven, and difficult to sustain. The GenAI moment represents the first major test of whether that lesson has truly been learned.

The April 2026 AI Policy: A First Answer, Briefly Appraised

The University of Ghana has already taken its first significant step in responding to the challenges posed by generative artificial intelligence. In April 2026, the University adopted the *Policy on the Use of Artificial Intelligence at the University of Ghana* (University of Ghana, 2026), thereby establishing a formal framework for AI governance. Notably, this is the very kind of institutional response that participants at the Sakai@10 Conference identified as necessary for the responsible integration of AI into higher education.

When assessed against the governance framework developed in the systematic review by Yarboi et al. (2026), the policy compares favourably with many existing institutional approaches. It can be situated within what the review describes as the “balanced” category of AI governance frameworks. Several features are particularly noteworthy. The policy is informed by local survey evidence rather than being imported wholesale from external contexts. It provides relatively clear guidance on the disclosure and citation of AI use, reserves high-stakes academic and administrative decisions for human judgment, and demonstrates a strong commitment to accessibility. It is also unusual in its reciprocal approach, requiring transparency not only from students but also from faculty and the University itself regarding AI use.

However, the policy's strengths are accompanied by important limitations. As the systematic review notes, implementation remains the weakest dimension of AI governance in higher education worldwide, and the University's policy exhibits many of the same challenges. While it establishes expectations for responsible AI use, it does not create a dedicated governance body to oversee implementation. Nor does it provide funding for capacity building, faculty development,

or student training. The policy is similarly silent on sanctions, appeals procedures, and mechanisms for periodic review and revision.

More fundamentally, the policy imposes compliance obligations without guaranteeing equitable access to AI tools. In effect, it regulates the use of technologies that many students and staff can access only through personal devices, private subscriptions, and individual financial resources. This raises the possibility that compliance and effective participation may become functions of personal means rather than institutional provision. Furthermore, the policy does not address several concerns that recent scholarship identifies as central to ethical AI governance, including multilingualism, biases in AI-text detection systems (Liang et al., 2023), questions of data sovereignty (African Union, 2024), and the need for assessment redesign in response to AI-assisted learning and writing (Cotton et al., 2024; Yarboi et al., 2026).

A comprehensive evaluation of the policy falls beyond the scope of this article, which focuses primarily on the first decade of Sakai at the University of Ghana. Nevertheless, the key questions that such an evaluation would inevitably raise can be stated succinctly. Who is responsible for implementing and overseeing the policy, and with what resources? Can faculty and students comply with its requirements in equitable ways? How will alleged violations be investigated and adjudicated fairly? What safeguards exist for institutional and personal data? And how will AI governance be integrated with the University's existing digital governance structures, including those developed around Sakai? These questions return us to the central lesson of the Sakai decade. Adoption should not be confused with institutionalisation. The AI policy represents an important act of adoption, but adoption alone does not guarantee meaningful and sustainable change. The institutionalisation of AI governance, through resources, structures, training, accountability mechanisms, and continuous evaluation, remains the more demanding task ahead. Yet embedded within these challenges is a significant opportunity. Because Ghanaian universities remain at a relatively early stage of AI governance development, they are not yet locked into mature but potentially ill-suited models imported from other regions (Yarboi et al., 2026). This creates space for innovation and contextual adaptation.

In this regard, the University of Ghana is particularly well positioned. It possesses a decade of institutional learning from LMS implementation, an established body of research on digital pedagogy, experience managing a self-hosted open-source platform, and a newly adopted AI policy awaiting operationalisation. Together, these assets provide a strong foundation for developing governance approaches that integrate ethical principles, pedagogical objectives, and institutional policy within a locally grounded framework. Such efforts could also contribute

beyond the University itself. The global literature on AI governance continues to be dominated by perspectives originating in North America and Europe, while African experiences remain underrepresented (Yarboi et al., 2026). This creates an opportunity for the University to develop approaches that respond to African educational realities and draw on relational and communal ethical traditions, including Ubuntu, which remain strikingly underexplored in current AI governance debates.

Ultimately, the systematic review advances an important insight: the margins of the evidence base are analytically central. The contexts in which ethical AI integration is most difficult are often the contexts from which the most valuable theoretical and practical lessons emerge. If this proposition is correct, then institutions such as the University of Ghana are not merely recipients of global governance models. They are potential sites for generating the next generation of theory, policy, and practice for the ethical integration of AI in higher education.

Lessons of the Decade, Restated Critically

The lessons conventionally drawn from the Sakai decade and rehearsed at the conference remain valid, but the evidence assembled in this Special Edition, together with the trajectory of the new AI policy, permits sharper formulations:

- **Adoption is not institutionalisation.** Deploying a platform or adopting a policy is the beginning of digital transformation, not its achievement. Institutionalisation requires sustained investment in training, workload recognition, monitoring, and pedagogical redesign and it is measurable, as the post-pandemic engagement decline demonstrates.
- **Infrastructure and training are inseparable.** The histories of KEWL and Sakai suggest that infrastructure and training cannot be treated as separate concerns. Both are recurring institutional commitments rather than one-off capital expenditures. The limitations of each platform were linked not only to technological challenges but also to insufficient ongoing support and capacity development. Sustainable digital transformation therefore requires continuous investment in both technological resources and user training.
- **Resilience must be designed, not improvised.** The COVID-19 achievement was real, but it was emergency remote teaching, and its gains decayed when compulsion eased. Robust systems, redundancy, and institutionalised continuity planning are the durable form of the pandemic lesson.
- **Openness is conditional.** Open-source licensing provides the foundation for openness, but not its realisation. Accessibility, adaptability, and equity are achieved only through

sustained investments in infrastructure, human capacity, and policy support. In their absence, an open-source platform can become just as restrictive and exclusionary as a proprietary one.

- **Equity is a design principle, not an afterthought.** Every wave of educational technology at the University has stratified access by bandwidth, device, data cost, literacy, and gender before corrective action was taken. A policy that imposes compliance obligations without providing equitable access to AI tools risks transforming lawful use from an institutional entitlement into a function of personal means and private resources
- **Governance must keep pace with technology.** Governance is measured not by policy statements alone, but by the institutional machinery that supports them. The experiences of KEWL, Sakai, and now GenAI reveal a recurring pattern in which adoption advances faster than governance capacity, with the resulting burdens falling most heavily on the least-resourced users. Principles, prohibitions, and disclosure requirements provide a foundation, but it is governance bodies, budgets, training, equitable access, due process, and continuous review that ultimately determine whether technological innovation produces inclusion or inequality (Yarboi et al., 2026).
- **Research must drive policy and include independent evaluation.** The University's own scholarship has informed training, implementation, and strategic planning. Yet an evidence base produced predominantly by committed institutional actors should be complemented by independent, comparative, and longitudinal research. Such work is essential for validating findings, identifying blind spots, and supporting stronger claims about institutional impact and effectiveness.

Looking Ahead: Policy, Practice, and a Research Agenda for the Next Decade

Looking ahead, the challenge for the University of Ghana is to think bigger and act more boldly, while remaining guided by the lessons of the past decade which indicate that successful digital transformation depends not only on technological adoption but also on governance, capacity building, and equitable access. Against this backdrop, the strategic directions identified at the Sakai@10 Conference remain both relevant and compelling, and the emergence of GenAI gives them renewed urgency. These priorities include advancing mobile-first and offline-capable learning environments, recognising that smartphones remain the primary means of access for many students. They also include integrating AI and academic-integrity tools within the University's

governed and self-hosted Sakai ecosystem rather than leaving students and faculty dependent on unregulated consumer platforms.

Beyond the University itself, the conference highlighted opportunities to extend digital transformation into pre-tertiary education and to support broader Pan-African digital education initiatives. Such initiatives would promote open-source technologies, culturally relevant learning resources, and shared digital infrastructure capable of reducing costs and expanding access across institutions. Equally important is the continued development of communities of practice that can pilot, evaluate, and refine emerging technologies through systematic inquiry rather than technological enthusiasm alone.

These priorities align closely with the University's Strategic Plan (2024-2029) and are already reflected in the School of Continuing and Distance Education's expanding programme portfolio. Among the initiatives are MA/MPHIL Human Resource Development and M.Phil in Educational Technology, all of which are designed and delivered face to face, blended, and fully online modes supported by the Sakai LMS. Together, these developments signal an emerging vision of digital transformation that extends beyond platform adoption to encompass innovation in teaching, learning, research, and institutional capacity building.

At the institutional level, the immediate priority is to move beyond policy adoption and towards implementation. The University's April 2026 AI Policy provides an important framework, but its effectiveness will depend on the governance structures, resources, and capacities that support it. In other words, the task is to build the institutional machinery around the policy itself. This priority aligns with several recommendations advanced at the Sakai@10 Conference. These include establishing a well-resourced directorate dedicated to digital educational advancement, creating a dedicated budget for LMS development and maintenance, and appointing an academic officer with expertise spanning both pedagogy and information technology within the IT Directorate.

Equally important are continued investments in server infrastructure, learning-centre computing facilities, and instructional design personnel. The conference also highlighted the need for mandatory hybrid-format LMS and digital-literacy training for both faculty and students, beginning at orientation and continuing throughout their engagement with the University. Accessibility must likewise remain a priority, with systematic use of platform features that support students with special educational needs. For AI governance specifically, implementation should be guided by a clear sequence. A standing governance committee, linked to the E-Learning Quality Control Committee, should provide oversight and accountability. Institutional access to approved AI tools should be established before compliance requirements are enforced, ensuring that

responsible use is not dependent on personal resources. Mandatory AI-literacy programmes, supported by dedicated funding, should follow alongside initiatives to redesign assessment practices for AI-rich learning environments. Such work should be recognised within faculty workload models. In addition, the University should establish transparent evidentiary standards and appeal procedures for AI-related misconduct cases and develop a data sovereignty and procurement framework that leverages its self-hosted Sakai environment. The guiding principle should be simple: governance and provision must precede enforcement. This reverses the sequence that contributed to the limitations of both the KEWL and Sakai experiences.

The implications are equally significant for researchers and, in particular, for MJDES readers and future contributors. The field must mature methodologically as well as thematically. Much of the existing literature remains dominated by cross-sectional studies of perceptions and attitudes. While such studies have generated valuable insights, their explanatory value is increasingly limited. Future research should prioritise longitudinal designs capable of tracking adoption, engagement, and learning outcomes across multiple academic years. Greater attention should also be given to studies of actual technology use rather than self-reported behaviour. Learning analytics, classroom observation, and digital ethnography can provide richer evidence about how digital technologies are integrated into teaching and learning. Similarly, researchers should evaluate governance, training, and support interventions, focusing not merely on what policies prescribe but on whether they change practice, for whom, and at what cost. The University's April 2026 AI Policy presents a particularly timely case for such evaluation. Equity must remain central to this research agenda. Future studies should examine how factors such as gender, language, disability, fee-payment status, and geographic location interact to shape digital participation and educational outcomes. Design-based research is also needed to develop and test authentic assessment approaches suited to AI-enabled learning environments. At the same time, independent and comparative studies across Ghanaian and African institutions would help assess the transferability of findings generated largely by institutional insiders.

Finally, the field requires more ambitious theory-building grounded in African realities. Areas such as Ubuntu-informed ethics, data sovereignty, epistemic justice, and locally situated models of AI governance remain underdeveloped despite their growing importance. Expanding research in these areas would enable African universities not only to respond to global debates but also to shape them. By embedding this research agenda within the continued evolution of its digital learning environment, the University of Ghana can move beyond being a consumer of educational technology and governance models. Instead, it can become a significant contributor to theory

development, governance innovation, and contextually grounded approaches to digital education and artificial intelligence.

Conclusion

Ten years after its introduction, the evidence presented at the Sakai@10 Conference and throughout this Special Edition supports a conclusion that acknowledges both achievement and limitation. Sakai has evolved into far more than a technological platform at the University of Ghana. It enabled teaching and learning continuity during a global crisis, contributed to the development of a new generation of scholars and practitioners in digital education, and connected the University to an international community committed to open-source innovation and collaboration. At the same time, the University's experience over the past decade reveals several important lessons. It highlights the distinction between adopting a technology and fully institutionalising it. It demonstrates the difference between crisis-driven adaptation and resilience built through deliberate planning and sustained investment. It shows that the promise of openness is not automatically realised but depends on supportive conditions. Most importantly, it illustrates how digital transformation can either reduce existing inequalities or inadvertently reproduce them.

These lessons should not be viewed as shortcomings in the University's digital transformation journey. Rather, they constitute its most valuable contribution. They provide a foundation for understanding the challenges that now accompany the rapid emergence of generative Artificial Intelligence (GenAI). In many respects, GenAI tests the same institutional questions that shaped the University's experience with KEWL and Sakai, but at a much faster pace and with significantly higher stakes. The University has already begun to respond. The adoption of the *Policy on the Use of Artificial Intelligence at the University of Ghana* in April 2026 represents an important first step and provides the foundation for a more coordinated approach to AI governance. The policy contains many of the elements needed to avoid repeating the patterns identified throughout this article. However, experience from the Sakai decade suggests that neither policy nor technology alone produces meaningful change. The real challenge lies in implementation. Effective governance depends not only on principles and regulations but also on the institutional structures that support them. Governance requires resources, oversight, capacity building, training, accountability mechanisms, and ongoing evaluation. Consequently, the future impact of the University's AI policy will depend less on the strength of its wording than on the resources and institutional commitment devoted to its operationalisation.

As co-chairs of the Sakai@10 Conference and guest editors of this special edition, we therefore invite readers to engage with the articles that follow not as a commemoration of past achievements but as a critical, evidence-based assessment intended to inform the future. The purpose of this collection is not simply to reflect on a decade of digital learning but to contribute to the decisions that will shape the next one. The central lessons emerging from this review are clear. Governance must precede technological adoption. Equity must be built into digital systems by design rather than addressed retrospectively. Digital and AI literacy should be treated as essential infrastructure rather than optional support services. Research must remain a continuous component of digital transformation, with particular emphasis on independent, longitudinal, and African-centred scholarship capable of informing both policy and practice. Ultimately, the success of the University's next phase of digital transformation will depend not on how quickly it adopts new technologies, but on how effectively it governs, supports, and evaluates them. The University's second decade of digital learning will be judged by its ability to align technology, governance, pedagogy, and equity in ways that produce meaningful and sustainable educational outcomes

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