

LITERATURE REVIEW

Digital Education for Peacebuilding in Post-Conflict Contexts: A Systematic Review of ICT-Enabled Learning with Insights for Rebuilding Sudan

Denis Musinguzi

*School of Arts and Social Sciences (SASS)
Uganda Martyrs University, Uganda
Email: dmusinguzi@umu.ac.ug
ORCID: 0009-0002-6521-4141*

Joseph M. Ntayi

*Faculty of Economics, Energy and Management Sciences
Makerere University Business School, Kampala, Uganda
Email: ntayius@gmail.com
ORCID: 0000-0003-3223-2036*

James Mubangizi

*Faculty of Economics, Energy and Management Sciences
Makerere University Business School, Kampala, Uganda
Email: mubangizi.james@mubs.ac.ug
ORCID: 0009-0000-3471-806X*

Tonny Kiggundu

*Faculty of Economics, Energy and Management Sciences,
Makerere University Business School, Kampala, Uganda
Email: tkiggundu@mubs.ac.ug
ORCID: 0000-0002-0715-0111*

ABSTRACT

BACKGROUND: This systematic literature review examines Information and Communication Technology (ICT)-enabled education for peacebuilding in post-conflict contexts, offering insights for the rebuilding of Sudan's education system.

METHODS: Using SPIDER criteria and PRISMA guidelines, 49 peer-reviewed studies were selected via systematic searches of Scopus, Web of Science and databases of grey literature.

CITATION: Musinguzi, D., Ntayi, J. M., Mubangizi, J. and Kiggundu, T. (2026): Digital education for peacebuilding in post-conflict contexts: a systematic review of ICT-enabled learning with insights for rebuilding Sudan. *International Journal of Innovation and Knowledge Management in the Middle East and North Africa (IJKMMENA)*, Vol. 11, Nos. 1/2, pp.19-38.

RECEIVED: 19 December 2025 / **REVISED:** 10 February 2026 / **ACCEPTED:** 23 February 2026 / **PUBLISHED:** 10 July 2026

COPYRIGHT: © 2026 by all the authors of the article above. The article is published as an open access article by WASD under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

RESULTS: Results showed a diverse set of ICTs, mobile learning, offline digital tools, blended models, and peace education platforms, deployed in a variety of conflict environments. Recorded impacts included better access to learning and continuity of education, increased social cohesion, leadership strengthening, and recovery from trauma. Enabling factors such as institutional readiness, cultural adaptation, teacher capacity, and community engagement, and barriers such as limited connectivity, funding fragility, and gender differences are highlighted. Twelve key lessons were identified to guide the recovery strategy for Sudan's education system.

CONCLUSIONS: ICT can support educational recovery and peacebuilding, but success in Sudan depends on strategic integration, local ownership, inclusive design, policy alignment, and longitudinal, multi-sectoral evaluation to ensure sustainable impact.

KEYWORDS: *Digital Education; ICT Intervention; Post-Conflict Reconstruction; Educational Continuity; Peace Building; SPIDER Framework; Fragile States; Teacher Education; Mobile Learning; Offline Solution; Education Equity.*

INTRODUCTION

War and political instability continue to disrupt education globally, leaving millions without safe, quality learning opportunities. The Global Education Monitoring Report Team (GEM Team, 2023) estimates that over 222 million crisis-affected children need urgent educational support, with 78 million out of school. Conflict damages infrastructure, displaces teachers, and weakens institutional governance, undermining learning. In such contexts, digital education, via mobile devices, online platforms, and offline content, has become essential for maintaining learning continuity, building resilience, and supporting peacebuilding.

Over the past decade, Information and Communication Technologies (ICTs) have become a key focus for international and national development partners addressing school disruptions in conflict-affected regions. Evidence from South Sudan, Afghanistan, Bosnia, and Syria shows that ICT-based interventions can restore learning continuity while promoting social cohesion, leadership, and civic engagement. These interventions include mobile self-learning tools, university programmes, and multimedia peace curricula (Hennessy *et al.*, 2021; INEE, 2021; Red Elephant Foundation, 2013). In Sudan, where 6.9 million children remain out of school amid ongoing conflict and the impact of COVID-19, digital education is essential for educational recovery and national peacebuilding (OCHA, 2024).

The literature on digital education in conflict-affected contexts is highly fragmented across education, peace and conflict studies, development, and ICT policy, with no systematic meta-analysis examining what interventions are implemented, their effects, and the conditions for success or failure. Previous reviews either focused on low-income conflicts without emphasising digital education (Trucano, 2016) or broadly on education in emergencies without isolating digital approaches (Nicolai and Hine, 2015). Limited but valuable insights exist on lessons transferable to post-conflict reconstruction, such as in Sudan, where civil war, economic collapse, and weakened institutions have severely disrupted the education system (UNICEF, 2024).

This paper fills a research gap by conducting a systematic literature review (SLR) of 49 ICT-based education interventions in post-conflict and fragile contexts to inform Sudan's educational

reconstruction. It contributes by first developing a taxonomy of ICT initiatives for conflict-affected education systems. It then integrates educational and peacebuilding outcomes such as leadership, inclusion, and resilience, finally offering globally relevant policy and design recommendations for Sudan. The study extends the SPIDER framework, advances theory in education in emergencies and digital pedagogy, and underscores education's role in peacebuilding and societal transformation.

METHODOLOGY

Conceptual Framework and Review Design

This systematic literature review (SLR) explores digital education in post-conflict settings, emphasising its impact and relevance to rebuilding Sudan's education system. It applies three methodological frameworks: PRISMA 2020 for transparent reporting, SALSA (Search, Appraisal, Synthesis, Analysis) for guiding methodological processes, and the SPIDER tool for structuring research questions and analysing qualitative and mixed-methods evidence. Combined, these frameworks ensure a systematic and replicable approach to evaluating how digital education promotes peacebuilding and sustains learning in fragile contexts (Cooke *et al.*, 2012; Mengist *et al.*, 2020; Moher *et al.*, 2009; Page *et al.*, 2021).

Research Questions

This systematic literature review aims to answer four key questions:

1. What types of ICT interventions have been implemented?
2. What educational and peacebuilding outcomes have been documented?
3. What contextual factors enable or hinder these interventions?
4. What lessons can inform the reconstruction of Sudan's education system?

Search Strategy and Sources

A systematic search strategy was used to identify relevant studies. The initial dataset of 26 articles was sourced from the Elicit Semantic Scholar database that applies machine learning to index over 126 million papers. Additional searches in Scopus, Web of Science, Google Scholar, and institutional databases (UNICEF, UNESCO, World Bank, INEE) expanded and validated the evidence. Keywords included “post-conflict education”, “ICT in education”, “digital learning”, “peacebuilding”, “war-affected students”, and “Sudan education reconstruction”. Searches covered English-language publications from 2000-2024, including grey literature from credible international organisations.

Eligibility Criteria

The inclusion criteria ensured empirical relevance. Studies were selected if they investigated digital or ICT-supported education in formal or non-formal settings within post-conflict, fragile, or

unstable contexts, and assessed learning outcomes such as continuity, access, or literacy, as well as effects such as psychosocial support or peacebuilding. Eligible works included original empirical studies (qualitative, quantitative, or mixed-method) and review articles with structured synthesis and new insights. Excluded were studies limited to infrastructure, unrelated to conflict contexts, or not published in English.

Material Collection

The PRISMA 2020 flow model guided the screening process. From an initial 1,200 records, 218 duplicates were removed. Title and abstract screening excluded 850 irrelevant studies. Of the remaining 132 full-text articles, 83 were excluded for lacking empirical data, having a purely theoretical focus, or omitting digital education elements. Ultimately, 49 studies met all inclusion criteria, 26 from the Elicit dataset and 23 from additional searches, and were included in the final synthesis, as shown in Figure 1.

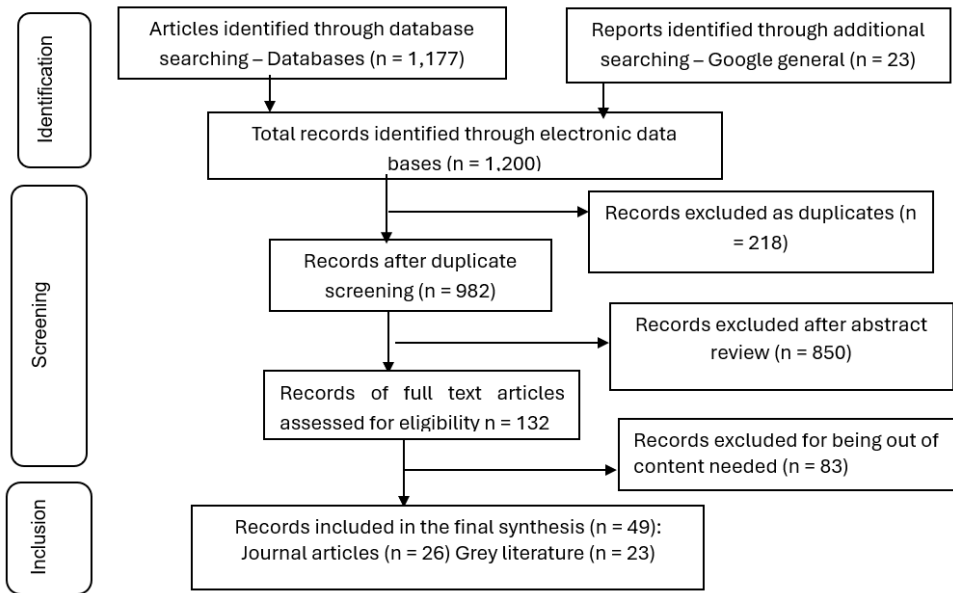


Figure 1: PRISMA flow chart

Source: Constructed by authors

Data Extraction and Coding

A structured protocol ensured consistency and comparability in data extraction across studies. Key variables included study context, conflict type, educational setting, digital intervention type,

target population, study design, and reported outcomes. Data were organised in a coded matrix to facilitate cross-comparison and thematic trend analysis.

RESULTS

Study Characteristics

This section summarises the 49 studies in the review, highlighting digital education types, targeted education levels, geographic contexts, and reported outcomes. The table in the Appendix provide a consolidated visual overview.

Findings Related to RQ1: ICT-Enabled Educational Interventions in Post-Conflict Settings

The 49 studies reveal diverse educational technologies in conflict-affected settings, varying in both form and guiding rationale. Table 1 details intervention types, study counts, and contexts, with Figure 2 offering a visual summary.

Table 1: ICT Intervention Matrix for RQ1

ICT Intervention Type	Context-Specific Use	Framework Alignment	No. of Studies (n=49)
E-learning Platforms (asynchronous, LMS)	Higher education, flexibility in post-conflict recovery	ODL, Digital Transformation	6
Online Platforms (synchronous, web portals)	Health/medical education, diaspora engagement	ODL, Remote Health Education	5
Mobile Learning (apps, SMS, M-learning)	Low-bandwidth areas, youth learning, refugee settings	M-Learning, SDG 4 Tools	4
Offline Digital Solutions (preloaded libraries, tablets)	No Internet zones, crisis/displacement settings	Offline Digital Libraries	6
Blended Learning (digital + face-to-face)	University peace programmes, conflict-sensitive pedagogy	Blended Learning Models	3
MOOCs/Open Access Courses	Global migrant/refugee learners with internet access	MOOC Integration	3
Peace Education Platforms (ICT-based civic learning)	Civic engagement, youth deradicalisation in fragile zones	Peace Education Models	4
EdTech Implementation Bundles (multi-tool use)	Broad packages for conflict/post-conflict systems	EdTech Hub Framework	2
ICT Infrastructure & Networks (access-focused)	Basic access initiatives in infrastructure-poor areas	ICT4D, Infrastructure Focus	2
Knowledge-Based Systems (KBS) (decision-support tools)	University research systems in post-conflict Sudan	KBS Framework	2

ICT Intervention Type	Context-Specific Use	Framework Alignment	No. of Studies (n=49)
Multimedia Curricula (narrative, audio-visual)	Reconciliation, memory, peace storytelling	Narrative Peace Curricula	2
ICT Checklists/Planning Tools	Guidelines for intervention design (crisis settings)	INEE EiE Guidelines	2
Unspecified or General Digital Interventions	Studies mention ICT broadly without specifics	N/A or not clearly reported	8
Total			49

Source: Constructed by authors from the literature review

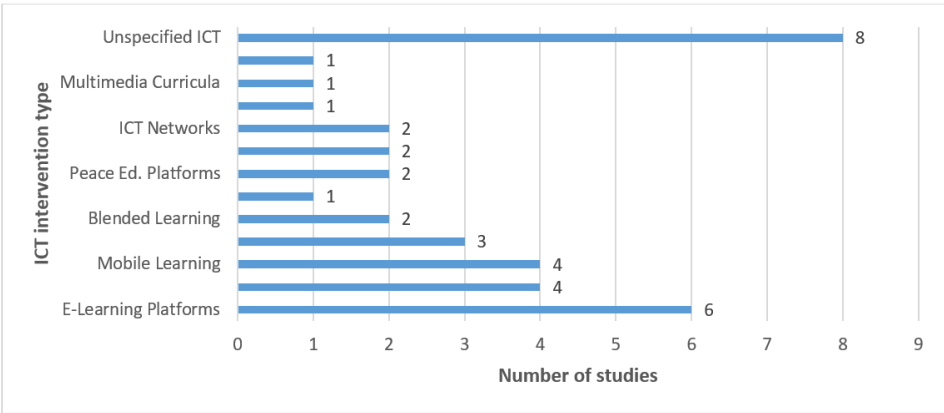


Figure 2: Frequency and Thematic Application of ICT Interventions in Post-Conflict Settings

Source: Constructed by authors from literature review

RQ2 Findings: Educational and Peacebuilding Outcomes of ICT-Enabled Interventions

The 49 studies reviewed show that ICT-enabled interventions impact educational continuity, social integration, skill development, and long-term peacebuilding. Table 2 summarises thematic patterns and empirical results, with Figure 3 providing a visual overview.

Table 2: The Thematic Patterns and Empirical Evidence

Outcome Theme	Qualitative/ Quantitative Evidence	Education Level Affected	Outcome Duration	Equity/Gender Sensitive	No. of Studies (n=49)
Educational Access and Continuity	Increased access, reduced dropout (quantitative)	Primary, Secondary, Tertiary	Long-term	Yes (refugees, displaced)	15

Outcome Theme	Qualitative/ Quantitative Evidence	Education Level Affected	Outcome Duration	Equity/Gender Sensitive	No. of Studies (n=49)
Social Cohesion and Peacebuilding	Narratives of inclusion, trust, cohesion (qualitative)	Primary, Secondary	Long-term	Yes (youth, gender, civic inclusion)	10
Digital Literacy and Skills Development	Tech use assessments, digital skills growth (quantitative)	Tertiary, Secondary	Long-term	Yes (tech equity)	6
Leadership and Mentorship Development	Self-reports, mentorship tracking (mixed)	Tertiary	Long-term	No explicit mention	3
Improved Learning Outcomes	Test scores, engagement gains (quantitative)	Primary, Secondary	Short- to Mid-term	No explicit mention	6
Conflict Resolution and Reconciliation	Healing, inter-ethnic understanding (qualitative)	Secondary	Long-term	Yes (post-conflict trauma)	2
Emergency/Crisis Continuity (e.g., COVID, Ebola)	Continuity plans, emergency scale-ups (mixed)	Primary, Tertiary	Short-term	Yes (displacement, crisis)	3
Not Specified or Vague Outcome	Vague claims, no direct measures	Unspecified	Unclear	No	4
Total					49

Source: Constructed by authors

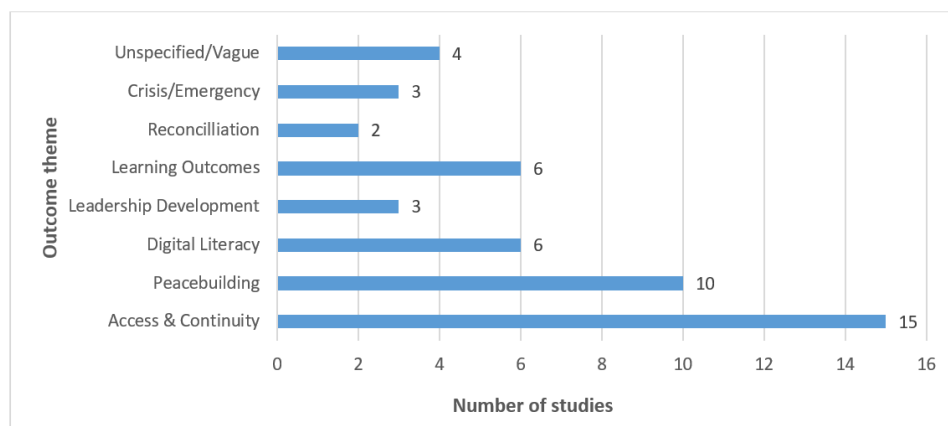


Figure 3: Educational and Peacebuilding Outcomes of ICT Interventions in Post-Conflict Settings

Source: Constructed by authors

Findings RQ3: Contextual, Infrastructural, and Institutional Factors Shaping ICT Effectiveness

From the 49 reviewed studies, 15 inter-dependent factors were identified (Table 3), including technological capacity, digital competence, policy alignment, cultural adaptation, and cross-sector collaboration.

Table 3: Enablers and Barriers Matrix for RQ3

Factor Type	Effect on Implementation	SPIDER Link (Design/Evaluation)	No. of Studies (n=49)
Connectivity and Technological Infrastructure	Enabler/Barrier	Platform accessibility; technological design limitations	3
Electricity and Hardware Access	Barrier	Device deployment feasibility; solar-powered solutions	4
Faculty Digital Readiness and Training	Enabler/Barrier	Instructor preparedness; adaptive learning design	2
Institutional Policy and Governance Support	Enabler	Policy integration, institutional scale-up readiness	5
Cultural and Linguistic Relevance	Enabler/Barrier	Language, cultural symbolism, local curriculum fit	3
User Motivation and Community Buy-in	Enabler	Learner engagement, parental/community support	3
Digital Content Quality and Curriculum Integration	Enabler/Barrier	Curriculum relevance, local pedagogy integration	4
Security and Conflict-Related Disruptions	Barrier	Access interruption, psychological safety concerns	6
Cost, Funding, and Affordability	Barrier	Programme affordability, donor funding stability	3
Monitoring, Evaluation, and Feedback Mechanisms	Enabler	Learning outcome tracking, feedback utilisation	3
Learner Digital Literacy and Accessibility	Barrier	Learner-level barriers to tech usage and access	4
Psychosocial Support and Trauma Sensitivity	Barrier	Emotional readiness; trauma-informed instructional design	2
Gender-Specific Digital Barriers	Barrier	Access for girls; digital harassment prevention	2
Scalability and Long-Term Sustainability	Enabler/Barrier	Capacity to scale beyond pilots; tech maintenance	2
Cross-Sector Collaboration and Stakeholder Engagement	Enabler	NGO-government alignment, multisector frameworks	3
Total			49

Source: Constructed by authors

Findings on RQ4: Implications for Rebuilding Sudan's Education Sector

The 49-study review highlights success, failure, and context-specific adaptations, with Table 4 presenting lessons transferable to Sudan's post-conflict setting.

Table 4: Matrix for RQ4: Lessons from ICT-based Education Efforts to Inform Reconstruction in Sudan

Key Lesson or Insight	Implications for Sudan	No. of Studies (n=49)
Offline solutions are vital in infrastructure-scarce zones	Prioritise offline content delivery in rural/war-affected zones	7
Mobile learning extends reach to refugees and displaced populations	Deploy mobile platforms to reach IDPs and nomadic learners	4
Blended learning strengthens peacebuilding and higher education recovery	Use blended models for higher education and reconciliation	3
Localised content promotes inclusion and cultural relevance	Translate and culturally adapt digital curricula	4
Teacher training is essential for effective ICT integration	Build teacher ICT capacity in universities and training colleges	3
Policy alignment and institutional ownership drive sustainability	Integrate ICT into national recovery education policy	4
Community involvement increases acceptance and engagement	Work with families and local leaders for programme uptake	4
Gender-Inclusive design closes access gaps in fragile states	Design interventions to address gender-specific needs and safety	6
Digital tools support psychosocial healing and civic dialogue	Use ICT for civic storytelling and post-trauma healing	4
EdTech must be matched with long-term financial planning	Develop sustainable funding models with local ownership	3
ICT must be linked to skills training and livelihoods	Link ICT to vocational and technical training for youth employment	5
Leverage diaspora and remote instruction for capacity gaps	Engage diaspora educators for remote delivery and skill transfer	2
Total		49

Source: Constructed by authors from literature review

DISCUSSION

This systematic review of 49 ICT-based education interventions in post-conflict and fragile contexts, guided by the SPIDER framework, examined intervention types, outcomes, facilitators, barriers, and transferable lessons. It situates the findings within broader theoretical and policy frameworks, synthesising global evidence on digital education's role in fragile settings and its relevance for rebuilding Sudan's education system.

Diversity and Flexibility of ICT Interventions in Fragile Contexts (RQ1)

The review identified a diverse range of ICT-based education interventions in conflict-affected contexts, including e-learning platforms, mobile apps, offline libraries, and blended learning. These interventions were applied flexibly, with mobile learning used in low-connectivity or refugee areas and blended learning in tertiary education. Reflecting the SPIDER framework, this diversity demonstrates technological pragmatism, emphasising context-appropriate solutions. Lesson design was shaped by learner diversity and contextual factors, highlighting that digital education in fragile settings must be adapted to pedagogical, institutional, and socio-cultural needs rather than simply based on available technology (Hosman *et al.*, 2024; Guerrini, 2014; Habib, 2023; LOYOC, 2020; Mercy Corps, 2016; Nisperos, 2014; Rumie, 2015; Taha *et al.*, 2023).

Education and Peacebuilding Outcomes: Evidence of Transformational Potential (RQ2)

The review found that digital education positively impacted learning continuity, peacebuilding, and leadership development, enhancing engagement, performance, and reducing dropout when aligned with student needs and institutional capacity. Programmes using storytelling, civic discussions, or culturally relevant content fostered community building and psychosocial healing, especially in post-genocide and ethnically divided settings. Consistent with the SPIDER framework, mixed-methods studies show that digital education can enable broader social transformation. However, outcome variability highlights the need for rigorous evaluation to ensure that both educational and peacebuilding goals are effectively achieved (Doerrer, 2019; Guerrini, 2014; LOYOC, 2018; Eltayib and Suliman, 2019; Buckland, 2004; PCRC, 2010; Red Elephant Foundation, 2016).

Systemic Enablers and Barriers to ICT Implementation (RQ3)

The study identified contextual, infrastructural, and institutional factors shaping the success of digital education in conflict-affected settings. Common infrastructure challenges, such as unreliable electricity and limited Internet, were often addressed with offline devices, solar kits, or low-bandwidth solutions. Institutional readiness, policy alignment, faculty capacity, and community involvement, was crucial for effectiveness. Programmes, including teacher training, local leadership, and culturally relevant content, improved engagement and sustainability. Aligned with the SPIDER framework, findings highlight that successful digital education requires integrating technical, political, and cultural dimensions within the broader contextual environment (Gajurel, 2023; Elshaiekh *et al.*, 2013; Guerrini, 2014; INEE, 2021; Kester, 2024; Maketo *et al.*, 2023; Koomar *et al.*, 2020; UNICEF, 2024).

Translational Lessons for Rebuilding Sudan's Education System (RQ4)

The review identified twelve key lessons from global evidence to guide Sudan's post-conflict education recovery. These include practical strategies such as offline-first designs and mobile learning for refugees, as well as strategic approaches such as policy alignment and diaspora engagement. Given Sudan's challenges, geographic constraints, instability, limited resources, and fragmented communities, successful reconstruction requires not only suitable technologies but also educator capacity building, localised content, community involvement, gender equity, and financial sustainability. Long-term planning, integrated with national development and robust monitoring, ensures contextualised, evidence-based implementation, guided by the SPIDER framework (Elshaikh *et al.*, 2013; Habib, 2023; Maketo *et al.*, 2023; Plan International, 2017; Hunter *et al.*, 2020; Red Elephant Foundation, 2016; Koomar *et al.*, 2020; Sareen and Mandal, 2024; UNESCO, 2015; Vanner *et al.*, 2017; Kelly and Souter, 2013).

CONCLUSIONS

This systematic review analysed 49 ICT-based education interventions in post-conflict and fragile contexts to inform Sudan's education reconstruction. Guided by the SPIDER framework, it structured evidence collection, thematic synthesis, and insight translation.

The findings show that ICT interventions are technically feasible and provide significant pedagogical and social benefits when contextually adapted. Interventions, ranging from mobile learning and offline libraries to social-emotional platforms, address both immediate educational needs and long-term goals such as social cohesion, leadership, and resilience. Success requires overcoming infrastructure, policy, teacher, community, and financial barriers, emphasising a systems approach.

Twelve lessons for Sudan highlight offline solutions, mobile learning, blended learning, and localised, gender-sensitive, trauma-informed designs. Transformative impact depends on co-ordinated efforts among government, educators, communities and partners, supported by sustained investment, rigorous evaluation, and equity-focused strategies, with digital innovation fostering education, agency, and peace.

Limitations and Recommendations for Future Research

Limitations

This systematic review of ICT-based education interventions in post-conflict contexts has several limitations. It was restricted to English-language peer-reviewed articles and select institutional reports, potentially excluding relevant grey literature or non-English sources, especially from non-Anglophone African or Middle Eastern countries. The analysis relied on secondary data with inconsistent outcome measures, limiting comparability and preventing causal claims or meta-analysis. Lessons for Sudan were drawn without primary fieldwork or stakeholder consultation,

requiring local validation. Additionally, the SPIDER framework, while effective for qualitative synthesis, may under-represent temporal, policy, and political-economy dimensions essential for sustainable ICT implementation.

Future research

Future research should use diverse, complementary approaches to understand socio-cognitive dynamics and stereotype-based effects in ICT education interventions. In-country studies in Sudan and similar contexts are needed, engaging educators, learners, policy-makers, and civil society to develop context-specific strategies. Stronger impact evaluations, including RCTs and longitudinal studies, should assess causal links between ICT use and educational or peacebuilding outcomes, considering equity factors. Research should also explore the political economy of ICT adoption and sustainability, investigate hybrid digital-human models, and expand conceptual frameworks beyond SPIDER to include resilience, systems thinking, and digital ethics for a comprehensive view of ICT's transformative role in post-conflict education.

APPENDIX A

1A: Characteristics of Included Studies (n = 49)

No.	Author(s)/Source	Country/Context	Digital Education Type	Education Level	Key Outcomes
1	Hosman <i>et al.</i> , 2024	South Sudan	Offline digital libraries	Not specified	Continuity, reduced digital gap
2	Alcaide and Greco, 2023	Sudan	Moodle	Tertiary	Learning, digital literacy
3	Brown <i>et al.</i> , 2023	Sudan	Game-based learning	Primary	Literacy, well-being
4	Kester <i>et al.</i> , 2022	Afghanistan, Somaliland	Not specified	Tertiary	Not specified
5	Elmahdi and AbdAlgane, 2024	Sudan	Open & Distance Learning	Tertiary	Continuity, comprehension
6	Habib, 2023	Syria	E-learning platforms	Tertiary	Access, collaboration
7	Sareen and Mandal, 2024	India	Blended/online	Tertiary	Not specified
8	Taha <i>et al.</i> , 2023	Sudan	Remote learning	Tertiary (medical)	Skills, continuity
9	Göç <i>et al.</i> , 2022	Sudan	Online	Tertiary (public health)	Leadership, mentorship
10	Maketo <i>et al.</i> , 2023	Zimbabwe	Mobile learning	Tertiary	Not specified
11	Shah <i>et al.</i> , 2024	Jammu & Kashmir	Not specified	Higher education	Literacy, cohesion
12	Doerrer, 2023	Rwanda	Not specified	Tertiary	Leadership, national stability

No.	Author(s)/Source	Country/Context	Digital Education Type	Education Level	Key Outcomes
13	Elshaiekh <i>et al.</i> , 2013	Sudan	Knowledge-Based Systems	Tertiary	Research access, quality
14	Eltayib and Suliman, 2019	Sudan	Online learning	Tertiary	COVID continuity
15	Pemunta and Nkongho, 2014	South Sudan	Not specified	Primary, Training	Peacebuilding
16	Buckland, 2004	Liberia, S. Leone	Not specified	Primary	Conflict resolution
17	Vanner <i>et al.</i> , 2017	Afghanistan, S. Sudan	Not specified	Primary	Inclusivity, peace
18	Tairab and Ronghuai, 2017	Sudan	ICT integration	Primary, Secondary	Access, literacy
19	Nisperos, 2014	Sudan	E-learning	Tertiary	Readiness
20	Tairab <i>et al.</i> , 2019	Sudan	E-classrooms	Primary, Secondary	Tech integration
21	Gajurel, 2023	Global	MOOCs, apps	All levels	Migrant/refugee access
22	Kester, 2024	Afghanistan, Somaliland	Not specified	Tertiary	Not specified
23	Achot and Kithinji, 2021	South Sudan	Not specified	Not specified	Peacebuilding
24	Daoust, 2017	South Sudan	Not specified	Not specified	Not specified
25	El-Kogali, 2011	Sudan (Darfur)	Not specified	Primary	Displaced student access
26	Mohamed Nour, 2015	Sudan	Internet-based tech	Tertiary	Knowledge transfer
27	Guerrini, 2014	Liberia (Ebola)	Offline tablets	Primary	Learning continuity
28	Rumie, 2015	Syrian refugees	Offline tablets	Primary, Secondary	Refugee access
29	ZaMirNET, 1994	Yugoslavia	ICT networks	Various	Peace, communication
30	Red Elephant, 2016	India	Peace ed. platforms	Secondary, Tertiary	Gender equality
31	Hunter <i>et al.</i> , 2020	Northern Ireland	Blended learning	Tertiary	Conflict studies
32	PCRC, 2010	Bosnia	Multimedia curricula	Secondary	Reconciliation
33	Martinez Sequero <i>et al.</i> , 2024	Global	Digital tools for peace	Various	Sustainability, conflict

No.	Author(s)/Source	Country/Context	Digital Education Type	Education Level	Key Outcomes
34	The University of the South Pacific, 2013	Pacific Islands	ICT in schools	Primary, Secondary	Quality, access
35	UNICEF, 2018	Global	ICT in Crisis Checklist	All levels	Implementation guidance
36	Bird, 2011	Lebanon, Nepal	Digital education	Primary, Secondary	Peacebuilding
37	Koomar <i>et al.</i> , 2020	Fragile states	EdTech	All levels	Learning gains
38	UNESCO, 2015	Global	ICT in education	All levels	Quality, access
39	Kelly and Souter, 2011	Global conflict zones	ICT support	All levels	Reconstruction
40	Save the Children, 2014	Conflict zones	Digital programmes	Primary	Emergency continuity
41	Mercy Corps, 2016	Syria	E-learning	Secondary	Improved outcomes
42	Plan International, 2017	South Sudan	Mobile learning	Primary, Secondary	Access expansion
43	NRC, 2019	Yemen	E-learning	Secondary	War-time learning
44	LOYOC, 2018	Cameroon	Peace ed. via ICT	Secondary	Youth violence reduction
45	LOYOC, 2020	Cameroon (COVID)	Online platforms	All levels	Continuity during crisis
46	Viggers, 2024	Rwanda	Curriculum reform	Secondary	Peace outcomes
47	Koomar <i>et al.</i> , 2020	Global	EdTech interventions	All levels	Access, outcomes
48	UNICEF and Save the Children, 2023	Syria, Ethiopia	SMS/radio	Primary	Education during war
49	ICRC, 2022	Somalia	Mobile health ed.	Tertiary	Healthcare training

REFERENCES

- Achot, G.A.R. and Kithinji, L.N.R. (2021): The Impact of Armed Conflict and Education on Peace Building in South Sudan: A Case Study of Juba City, South Sudan. *The International Journal of Humanities & Social Studies*, Vol. 9, No. 8. Available at: <https://doi.org/10.24940/theijhss/2021/v9/i8/hs2108-014>
- Alcaide, J.C.N. and Greco, S. (2023): Online Education, International Cooperation and Sustainable Development in Sudan. *Social Education Research*, Vol. 4, No. 2, pp.209-226. Available at: <https://doi.org/10.37256/ser.4220232564>
- Bird, L. (2011): *Promoting resilience : developing capacity within education systems affected by conflict*. IIEP-UNESCO Think piece prepared for Global Monitoring Report 2011.

- Brown, F.L., Farag, A.I., Hussein Abd Alla, F., Radford, K., Miller, L., Neijenhuijs, K., Stubbé, H., de Hoop, T., Abdullatif Abbadi, A., Turner, J.S., Jetten, A. and Jordans, M.J.D. (2023): Can't Wait to Learn: A quasi-experimental mixed-methods evaluation of a digital game-based learning programme for out-of-school children in Sudan. *Journal of Development Effectiveness*, Vol. 15, No. 3, pp.320-341. Available at: <https://doi.org/10.1080/19439342.2020.1829000>
- Buckland, P. (2004): *Reshaping the Future: Education and Postconflict Reconstruction*. World Bank Publications, Washington DC, USA.
- Cooke, A., Smith, D. and Booth, A. (2012): Beyond PICO: The SPIDER tool for qualitative evidence synthesis. *Qualitative Health Research*, Vol. 22, No. 10, pp.1435-1443. Available at: <https://doi.org/10.1177/1049732312452938>
- Daoust, G. (2017): Education and the critique of liberal peacebuilding: The case of South Sudan. *Sustainability (Switzerland)*, Vol. 11, No. 1, pp.1-14. Doerrer, S.M. (2019): *Impact, Implementation, and Insights of Peace Education: A Case Study of the MA in Peace Studies and Conflict Transformation Program at the University of Rwanda*. Loyola Marymount University. Available at: <https://doi.org/10.2139/ssrn.4571387>. 393 pp.
- El-Kogali, S. (2011): Education during humanitarian emergencies: The situation of displaced children and youth in Darfur, Sudan. *Transitions to Adulthood*, Brief No. 32. New York Population Council.
- Elmahdi, O.E.H. and AbdAlgame, M. (2024): Evaluation of an ODL Contemporary Novel Program for Sudanese EFL University Students During the Wartime: A Case Study of Khartoum University. *English Language Teaching*, Vol. 17, No. 9, pp.34-42. Available at: <https://doi.org/10.5539/elt.v17n9p34>
- Elshaiekh, N.E.M., Farah, N.A.R.A. and Ibrahim, K.A. (2013): The Role of Knowledge Based System in Sudanese Higher Education Institutions. *Asian Journal of Management Sciences & Education*, Vol. 2, No. 4, pp.194-202.
- Eltayib, N.H.E. and Suliman, N.K.A. (2019): The Impact of COVID-19 on Sudanese Higher Education System. *International Journal of Science and Research (IJSR)*, Vol. 9, No. 7, pp.324-330.
- Gajurel, A. (2023): Bridging the digital divide in Nepal. *Nepal Live Today*. [Online] Available at: <https://www.nepallivetoday.com/2023/07/06/bridging-the-digital-divide-in-nepal/>
- Global Education Monitoring Report Team (GEM Team) (2023): *Global Education Monitoring Report, 2023: Technology in Education: A tool on whose terms?* Available at: <https://www.unesco.org/gem-report/en/publication/technology> 526pp.
- Göç, N., Hassan, S., Bani, I., Babiker, S., Hilali, M., Ibrahim, Z., Gaddal, A., Saleh, L., Salih, E.M., Desai, M.M. and Linnander, E. (2022): Strengthening Public Health Scholarship in Sudan: The Role of Leadership and Mentorship Development. *The American Journal of Tropical Medicine and Hygiene*, Vol. 107, No. 6, p.1323. Available at: <https://doi.org/10.4269/ajtmh.22-0377>
- Guerrini, F. (2014): *The Rumie Initiative: Using Tablets As Learning Tools In Ebola-Stricken Communities*. [Online] Forbes. Available at: <https://www.forbes.com/sites/federicoguerrini/2014/12/11/eduoverebo-using-tablets-to-help-liberian-children-study-in-spite-of-ebola/>.

- Habib, M. (2023): Digital transformation strategy for developing higher education in conflict-affected societies. *Social Sciences & Humanities Open*, Vol. 8, No. 1, p.100627. Available at: <https://doi.org/10.1016/j.ssaho.2023.100627>
- Hennessy, S., Jordan, K., Wagner, D.A. and the EdTech Hub Team (2021): *Problem Analysis and Focus of EdTech Hub's Work: Technology in Education in Low- and Middle-Income Countries*. Working Paper 7, EdTech Hub. Available at: <https://docs.edtechhub.org/lib/PBXBB7LF>. 72pp.
- Hosman, L., Farrell, L., Nova, R. and Barrett, C. (2024): Educational continuity in emergencies: The role of offline digital libraries in under-connected communities. *Journal of Information Technology Education: Innovations in Practice*, Vol. 23, No. 1.
- Hunter, W., Austin, R. and Turner, R. (2020): Blended learning in an age of conflict. In Hunter, W. and Austin, R. (Eds): *Blended and Online Learning for Global Citizenship: New Technologies and Opportunities for Intercultural Education*. Routledge. Available at: <https://doi.org/10.4324/9780367821661-1>
- Inter-Agency Network for Education in Emergencies (INEE) (2021): *2021 Annual Report Message from the INEE Steering Group*. Available from: <https://reliefweb.int/report/world/inee-2021-annual-report>
- International Committee of the Red Cross (ICRC) (2022): *Somalia: Facts & Figures January - December 2022*. Available at: <https://blogs.icrc.org/somalia/wp-content/uploads/sites/99/2023/02/ENG-Somalia-Facts-Figures-JanDec-2022.pdf> 4pp.
- Kelly, T. and Souter, D. (2013): *The Role of Information and Communication Technologies in Postconflict Reconstruction*. World Bank Publications.
- Kester, K. (2024): Toward a conflict-sensitive approach to higher education pedagogy: lessons from Afghanistan and Somaliland. *Teaching in Higher Education*, Vol. 29, No. 2, pp.619-638.
- Kester, K., Abura, M., Sohn, C. and Rho, E. (2022): Higher education peacebuilding in conflict-affected societies: beyond the good/bad binary. *International Journal of Comparative Education and Development*, Vol. 24, Nos 3-4, pp.160-176.
- Koomar, S., Coflan, C.M. and Kaye, T. (2020): *Using EdTech in Settings of Fragility, Conflict and Violence: A Curated Resource List. [Institutional report]*. EdTech Hub. Available at: <https://doi.org/10.5281/zenodo.3885806> 14pp.
- Local Youth Corner Cameroon (LOYOC) (2018): *ICT for peace education in conflict zones*. 1-4. Retrieved from: <https://www.loyocameroon.org/salaam-initiative/>
- Local Youth Corner Cameroon (LOYOC) (2020): *Online learning continuity during COVID-19*. Available at: <https://www.loyocameroon.org/category/covid-19/>
- Maketo, L., Issa, T., Issa, T. and Nau, S.Z. (2023): M-Learning adoption in higher education towards SDG4. *Future Generation Computer Systems*, Vol. 147, pp.304-315. Available at: <https://doi.org/10.1016/j.future.2023.05.010>

- Martinez Sequero, A., Zia, A., Bruch, C., Jensen, D. and Halle, S. (2024): *Digital Technologies for Environmental Peacebuilding Horizon Scanning Of Opportunities & Risks*. United Nations Environment Programme. Available at: <https://repository.library.noaa.gov/view/noaa/71636>
- Mengist, W., Soromessa, T. and Legese, G. (2020): Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, Vol. 7, p.100777. Available at: <https://doi.org/10.1016/j.mex.2019.100777>
- Mercy Corps (2016): *Unlocking a Future for Syria's Youth*. [Online] Available at: <https://www.mercycorps.org/blog/unlocking-future-syria-youth>
- Mohamed Nour, S. (2015): The effect of ICT in knowledge in Sudanese universities and the labour market. *Contributions to Economics*, Vol.211, pp.305-338. Available at: https://doi.org/10.1007/978-3-319-13999-9_8
- Moher, D., Liberati, A., Tetzlaff, J. and Altman, D.G. (2009): Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *BMJ (Online)*, Vol. 339, No. 7716, pp.332-336. Available at: <https://doi.org/10.1136/bmj.b2535>
- Nicolai, S. and Hine, S. (2015): *Investment for education in emergencies A review of evidence*. Overseas Development Institute, London. Available at: <https://www.jstor.org/stable/pdf/resrep50562.pdf?acceptTC=true&coverpage=false&addFooter=false> 105pp.
- Nisperos, L.S. (2014): Assessing the E-Learning Readiness of Selected Sudanese Universities. *Asian Journal of Management Science and Education*, Vol. 3, No. 4, pp.45-59.
- Norwegian Refugee Council (NRC) (2019): *NRC in Yemen - E-learning in Yemen*. Available at: <https://www.nrc.no/countries/middle-east/yemen>
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., Tetzlaff, J.M., Akl, E.A., Brennan, S.E., Chou, R., Glanville, J., Grimshaw, J.M., Hróbjartsson, A., Lalu, M.M., Li, T., Loder, E.W., Mayo-Wilson, E., McDonald, S., McGuinness, L.A., Stewart, L.A., Thomas, J., Tricco, A.C., Welch, V.A., Whiting, P. and Moher, D. (2021): The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International Journal of Surgery*, Vol. 88, p.105906. Available at: <https://doi.org/10.1016/j.ijssu.2021.105906>
- Pemunta, N.V. and Nkongho, E.A.R. (2014): The Fragility of the Liberal Peace Export to South Sudan: Formal Education Access as a Basis of a Liberal Peace Project. *Journal of Human Security*, Vol. 10, No. 1, pp.59-75.
- Plan International (2017): *Plan International South Sudan Advocacy Strategy - Mobile learning in South Sudan*. March, 1-5. Available at: <https://plan-international.org/south-sudan/>
- Post-Conflict Research Center (PCRC) (2010): Ordinary Heroes Peace Education Program. PCRC. [Online] Available at: <https://p-crc.org/our-work/peace-education/ordinary-heroes/>
- Red Elephant Foundation (2013): *The Red Elephant Foundation from Wikipedia, the Free Encyclopedia*. Available at: https://en.wikipedia.org/wiki/The_Red_Elephant_Foundation
- Rumie (2015): *About Rumie: We bridge the digital divide in learning*. Available at: <https://about.rumie.org/about/>

- Sareen, S. and Mandal, S. (2024): Assessing SDG 4 indicators in online and blended higher education within conflict zones: A case study of northern India's higher education institutions. *Social Sciences & Humanities Open*, Vol. 9, p.100903. Available at: <https://doi.org/10.1016/j.ssaho.2024.100903>
- Save the Children (2014): Education in Emergencies: Cross-Cutting Issues Checklist. Child Rights Resource Centre. [Online] Available at: <https://resourcecentre.savethechildren.net/document/education-emergencies-cross-cutting-issues-checklist>
- Shah, M.A., Lodi, A.K. and Bhat, S.A. (2024): Development of Higher Education in Jammu and Kashmir: A Critical Review. *ACTA SCIENTIAE*, Vol. 7, No. 2. https://www.researchgate.net/profile/Muzamil-Shah-8/publication/384762490_DEVELOPMENT_OF_HIGHER_EDUCATION_IN_JAMMU_AND_KASHMIR_A_CRITICAL_REVIEW/links/67068f0756f2ab4a3418e29d/DEVELOPMENT-OF-HIGHER-EDUCATION-IN-JAMMU-AND-KASHMIR-A-CRITICAL-REVIEW.pdf. 13pp.
- Taha, M.H., Husain, N.E., Mukhtar, W.N.O. and Abdalla, M.E. (2023): Consolidating Medical Education in Sudan During War. *Sudan Journal of Medical Sciences*, Vol. 18, No. 3, pp.402-412. Available at: <https://doi.org/10.18502/sjms.v18i3.14093>
- Tairab, A. and Ronghuai, H. (2017): Analyzing ICT Policy in K-12 Education in Sudan (1990-2016). *World Journal of Education*, Vol. 7, No. 1, pp.71-82. Available at: <https://doi.org/10.5430/wje.v7n1p71>
- Tairab, A., Huang, R. and Chang, T.W. (2019): How Technologies Change Classrooms - A Case Study of K-12 Education in Sudan. In Chang, M., Popescu, E., Kinshuk, Chen, N.S., Jemni, M., Huang, R., Spector, J.M. and Sampson, D.G. (Eds): *Foundations and Trends in Smart Learning. Lecture Notes in Educational Technology* (pp.119-124). Springer, Singapore. Available at: https://doi.org/10.1007/978-981-13-6908-7_17
- The University of the South Pacific (2013): *ICT use in the South Pacific: Findings from the Pacific eLearning Observatory*. Available at: <https://www.usp.ac.fj/centre-for-flexible-learning/research-and-scholarship/flexible-learning/pacific-elearning-observatory/>
- Trucano, M. (2016): *SABER-ICT Framework Paper for Policy Analysis: Documenting national educational world and their evolution over time technology policies around the world and their evolution over time*. World Bank Education, Technology & Innovation: *SABER-ICT Technical paper Series (#01)*, Washington, DC: World Bank. Available at: <https://doi.org/10.1596/26107>
- United Nations Children's Fund (UNICEF) (2011): *The Role of Education in Peacebuilding : A synthesis report of findings from Lebanon, Nepal and Sierra Leone*. UNICEF, New York. Available at: https://educationanddevelopment.wordpress.com/wp-content/uploads/2014/11/eepect_peacebuildingsynthesisreport.pdf 40pp.
- United Nations Children's Fund (UNICEF) (2024): *UNICEF Global Annual Results Report 2023*. Available at: <https://www.unicef.org/media/162411/file/UNICEF-2023-GARR.pdf> 320pp.

- United Nations Children's Fund (UNICEF) and Save the Children (2023): *Accelerating inclusion of refugee children - Syria and Ethiopia*. 1-11. Available at: https://www.unicef.org/media/142081/file/Accelerating_inclusion_of_refugee_children.pdf 11pp.
- United Nations Children's Fund (UNICEF) (2018): *Checklist for Information and Communications Technologies (ICT) Interventions to Support Education in Crisis and Conflict Settings*. USAid, INEE and ECCN. Available at: <https://www.unicef.org/flnhub/media/1541/file/Checklist-for-ICT.pdf.pdf> 14pp.
- United Nations Educational, Scientific and Cultural Organization (UNESCO) (2015): *World Education Forum 2015: Final Report - ICT in education in conflict-affected regions*. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000243724>
- United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2024): *Global Humanitarian Overview 2024*. Available at: <https://www.unocha.org/publications/report/world/global-humanitarian-overview-2024-enarfres>
- Vanner, C., Akseer, S. and Kovinthan, T. (2017): Learning peace (and conflict): the role of primary learning materials in peacebuilding in post-war Afghanistan, South Sudan and Sri Lanka. *Journal of Peace Education*, Vol. 14, No. 1, pp.32-53. Available at: <https://doi.org/10.1080/17400201.2016.1213710>
- Viggers, J.P. (2024): *The Impact of Post-Conflict Education on Peacebuilding in Rwanda*. Master's Dissertation, Geneva Graduate Institute. Available at: <https://www.graduateinstitute.ch/communications/news/impact-post-conflict-education-peacebuilding-rwanda>
- ZaMirNET (1994): *ZaMirNET (ForPeaceNET)*. Wikipedia, the free encyclopedia. Available at: <https://en.wikipedia.org/wiki/ZaMirNET>

BIOGRAPHY



Dr Denis Musinguzi is a Senior Lecturer, School of Arts and Social Sciences, at Uganda Martyrs University, where he has served as Dean and Head of Department, Governance, Peace and International Studies. A former IDRC-UPEACE PhD Fellow, Dr Musinguzi has served as external examiner for different Universities at national and international level, and as a development consultant for different local and multinational organisations. He has contributed chapters to academic books and articles to refereed journals. His research interests are in the areas of public administration and management, public policy, youth empowerment and development, and post-conflict transformation.



Professor Joseph M. Ntayi is the Dean, Faculty of Economics, Energy and Management Science at Makerere University Business School. He holds a PhD (Marketing), an MBA (Marketing) and a Bachelor of Commerce (Marketing). He has over 31 years' experience in research, consultancy and teaching at the university, over 20 years of administrative work at the university, and 5 years of managing international projects. His teaching and research interests are in procurement, supply chain management, business ethics, leadership, occupational health and safety, marketing and financial inclusion. Professor Ntayi is on the editorial boards of several scholarly journals, a reviewer of many international journals, and a distinguished international scholar publishing over 150 journal articles in refereed journals. He has worked on Improving the Youth Entrepreneurial Mindset, Corporate Strategy, Coaching and Mentoring, Gender Mainstreaming, Public Sector Administration and Management, Assessing and Monitoring Universities and Higher Institutions of Learning, Curriculum Review and Development, Training and Assessment and Strategy. Professor Ntayi is also an Eminent Entrepreneur.



James Mubangizi is a Lecturer and Head of the Department of Oil and Gas at Victoria University, Kampala, Uganda. He is currently pursuing a PhD by coursework and research in Energy Economics and Governance at Makerere University, Kampala, Uganda. James' doctoral research focuses on the nexus between economic growth, renewable energy consumption, environmental degradation, and climate change in Uganda. The thesis aims to provide evidence-based insights to inform sustainable energy policies and climate change mitigation strategies in developing economies. His work contributes to the growing body of knowledge on energy economics and environmental governance in Africa.



Tonny Kiggundu is a lecturer at Makerere University Business School with over 12 years of teaching and research experience. As a passionate environmental advocate and governance expert, he is dedicated to advancing sustainable practices and innovative policy solutions. His research interests include environmental governance, sustainable development, public sector management, and institutional reform in developing economies. He has contributed to multidisciplinary research projects addressing climate resilience, organisational effectiveness, and policy implementation. He actively mentors students and collaborates with public and private sector stakeholders to promote evidence-based decision-making and responsible leadership for inclusive and sustainable socio-economic transformation and long-term community impact.

