Integrating Indigenous Knowledge Systems into AI Development in West Africa: A Systematic Literature Review

Lutwami Lutakire[1], **Kizza Kigozi**[2]

[1] Makerere University Business School (MUBS)

[2] Department of Cybersecurity, Kyambogo University, Kampala

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Correspondence: llutakire@yahoo.com

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Author notes

Lutwami Lutakire is affiliated with Makerere University Business School (MUBS) and focuses on Computer Science research in Africa.

Kizza Kigozi is affiliated with Department of Cybersecurity, Kyambogo University, Kampala and focuses on Computer Science research in Africa.

Abstract

The integration of Indigenous Knowledge Systems (IKS) into Artificial Intelligence (AI) development in West Africa has gained attention due to the potential for enhancing AI's applicability and effectiveness in local contexts. A comprehensive search strategy was employed across multiple databases including Web of Science and Scopus. Studies were screened based on predefined inclusion criteria related to AI integration with IKS. The review identified a consistent theme in favour of incorporating local knowledge, particularly traditional agricultural practices, into AI models for improved decision-making processes in rural settings. While preliminary evidence suggests the potential benefits of integrating IKS in AI development, further empirical research is needed to validate these findings and explore specific implementation strategies. Future studies should prioritise cross-cultural collaboration between technologists and local communities to ensure culturally sensitive AI applications are developed. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2,$ with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, AI development, Indigenous knowledge systems, Cultural integration, Ethnocomputing, Participatory design, Mixed-methods studies*

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