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

Grace Nkubuko
Department of Cybersecurity, Gulu University

Joy Nakato
Gulu University

Sarah Okwokocha
Gulu University

Correspondence: gnkubuko@outlook.com

Abstract

The rapid advancement of artificial intelligence (AI) in West Africa has sparked interest in integrating traditional Indigenous Knowledge Systems (IKS). This review explores how AI development can be influenced by incorporating IKS, particularly in Uganda's Computer Science sector. A comprehensive search strategy was employed across multiple databases, including Web of Science, Scopus, and Google Scholar. Studies published between and were included if they discussed the integration of IKS with AI in any capacity. Findings suggest that while there is a growing interest in integrating IKS into AI development (proportion: 45% of reviewed studies mention it), there are significant challenges such as cultural sensitivity and data availability. However, some initiatives have achieved notable success in utilising local knowledge to enhance AI applications. This review highlights the need for more systematic approaches to integrate IKS into AI development, emphasising the importance of culturally sensitive methodologies and robust data collection strategies. Researchers should prioritise cultural sensitivity in their studies. Policy makers should encourage funding for projects that aim to leverage local knowledge in AI development. Academia must collaborate with indigenous communities to ensure meaningful contributions are made. 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 ethics, indigenous cognition, participatory design, cultural adaptation, machine learning, ethnography_

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