



Contribution ID: 8

Type: Talk

AI-Powered Data Literacy for the Next Generation of Researchers: Rethinking Research Skills Development in Higher Education

The growing accessibility of Artificial Intelligence (AI) tools is transforming research methodologies across disciplines, creating new opportunities for data collection, analysis, interpretation, visualisation, and knowledge generation. From literature reviews and data coding to predictive analytics and automated reporting, AI technologies are increasingly becoming integrated into the research process. While these innovations have the potential to enhance research efficiency, productivity, and innovation, their effective and responsible use depends on researchers possessing strong data literacy competencies and a critical understanding of how data are generated, processed, interpreted, and governed. Consequently, higher education institutions face the challenge of preparing students and researchers to navigate AI-driven research environments in an ethical, informed, and responsible manner.

This research explores the evolving relationship between data literacy and artificial intelligence within the context of South African and African higher education. It examines how AI-powered tools can be incorporated into research training and capacity-building initiatives to strengthen competencies in research data management, data analysis, research ethics, critical evaluation, and evidence-based decision-making. Particular attention is given to the role of AI in supporting data-intensive research and the implications of these technologies for the development of future research skills.

The research also highlights several challenges associated with the increasing use of AI in research, including algorithmic bias, misinformation, hallucinated outputs, data privacy concerns, and an overreliance on automated systems that may weaken researchers' critical thinking and methodological understanding. These risks underscore the need for researchers to move beyond the passive consumption of AI-generated outputs and develop the ability to critically evaluate the quality, reliability, and ethical implications of AI-assisted research processes.

The study contends that to equip graduates for the digital knowledge economy, universities need to transcend conventional digital literacy programs and implement thorough AI-enhanced data literacy frameworks. These frameworks ought to encompass technical, analytical, ethical, and governance skills, while also fostering an understanding of data sovereignty and responsible data management. By cultivating researchers capable of effectively using AI and critically engaging with data, higher education institutions can enhance research capabilities, encourage innovation, and aid in the growth of Africa's emerging digital economy and sustainable development objectives.

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Track Classification: DIRISA