



BOMET UNIVERSITY



PROGRAMME

**1ST BOMET UNIVERSITY ANNUAL CONFERENCE, OPEN DAY AND INNOVATION
COMPETITION**

THEME:

**ARTIFICIAL INTELLIGENCE AS A TRANSFORMATIVE TECHNOLOGY:
UNLOCKING THE OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT**

DATE: 8TH - 9TH APRIL 2026

VENUE: BOMET UNIVERSITY

MODE: BLENDED

PREAMBLE

Bomet University was awarded a charter as full-fledged university on 4th February 2026. The university is committed to expanding access to quality education while emphasizing practical training, innovation, and academic excellence. The University has distinguished itself through its niche in *“Green Economy for Sustainability,”* which guides its teaching, research, and community engagement. This focus equips graduates with the knowledge and skills to address real-world challenges such as climate change and sustainable resource use. Bomet University aligns its activities with the United Nations Sustainable Development Goals, particularly in promoting quality education, climate action, and sustainable economic growth. It also contributes to Kenya’s Bottom- Up Economic Transformation Agenda (BETA) by supporting agriculture, environmental management, and enterprise development. Guided by its Strategic Plan, the University continues to strengthen research, innovation, and community engagement for sustainable and inclusive development.

Event Master of Ceremony.

1. Dr. Clement Nkaabu
2. Dr. Teclah Tuwei

DAY ONE: WEDNESDAY, 8TH APRIL 2026

TIME	ACTIVITY & DESCRIPTION	RESPONSIBILITY
8.00- 8.30 AM	Arrival and Registration of Guests and Participants	Event Secretariat Ms. Gwendolyn Machira Ms. Angela Sitonik

TIME	THE OFFICIAL OPENING CEREMONY VENUE: MPH	RESPONSIBILITY
8.30 AM	Prayer by Dr. Richard Rotich Anthems and Entertainment by Bomet University Choir.	MC
9.00 – 10.00 AM	Remarks by Prof. Johnmark Obura, Chair of the Conference Committee	MC
	Remarks by Prof. Patrick Ojera, Deputy Vice Chancellor, Academic and Student Affairs	Event Committee Chair
	Remarks by Prof. Charles Mutai, Vice Chancellor, Bomet University.	Deputy Vice Chancellor, Academic and Student Affairs
	Remarks and Official Opening of the Event by Prof. John O. Shiundu, Bomet University Council Chairperson	The Vice Chancellor

10:00-10:30 AM	Health Break	Chairperson –Protocol Sub-Committee
10.30-10:50 AM	Key Note Speaker 1: Prof .Chris Odindo	Prof. Johnmark Obura
10.50-11.10 AM	Key Note Speaker 2: Dr. Mugo Muchangi	
11.10-11:30 AM	Key Note Speaker 3: Mr. Tom Olumbo	
11:30 AM – 11:50 AM	Key Note Speaker 4: Rep. Red Cross, Kenya	
11:50-12:30PM	Plenary: Prof. Richard Mibey	
12:30 – 1:00PM	Statements by Sponsors (Communication Authority of Kenya)	Prof. Patrick Ojera
1:00 – 2:00PM	Health break	Chairperson Logistics Sub-Committee
2:00 -3:00PM	Breakaway Sessions with Four (4) presenters in each sub theme	Chairpersons of respective Sub-Themes
3:00 – 3:30 PM	Panel discussions	
3:30 -4:30 PM	Breakaway Sessions with Four (4) presenters in each sub theme	
4:30 – 5:00 PM	Panel discussions	
END OF DAY ONE		

DAY TWO: THURSDAY, 9TH APRIL 2026

TIME	ACTIVITY & DESCRIPTION Venue (Main Boardroom)	RESPONSIBILITY
7:30- 8.00 AM	Registration of Guests and Participants	Secretariat
PAPER PRESENTATIONS		
8:00-9:00 AM	Breakaway Sessions with Four (4) presenters in each sub theme	Chairpersons of respective Sub-Themes
9:00-9:30 AM	Panel discussions	
9:30 -10:30 AM	Breakaway Sessions with Four (4) presenters in each sub theme	
10:30-11:00 AM	Panel Discussions	
11:00-11:30AM	HEALTH BREAK	Caroline Onywany
11:30-12:30 P.M	Breakaway Sessions with Four (4) presenters in each sub theme	Chairpersons of respective Sub-Themes
12:30-1:00 PM	Panel discussions	
1:00-2:00 PM	LUNCH	Caroline Onywany
2:00-3:30 PM	Closing ceremony	MC
	- Remarks by the Vice Chancellor - Remarks by the Chair of Bomet University Council	Vice Chancellor
	Speech by the Chief Guest-HE. Prof. Hillary Barchok, the Governor Bomet County.	Council Chairperson
	Award Ceremony	Vice Chancellor
	Vote of Thanks Chairperson of Council Academic Committee	The Vice Chancellor

MESSAGE FROM THE CHAIRMAN OF COUNCIL

**PROF. JOHN SHIUNDU**

It is a great honour to join you at the **1st Bomet University Annual Conference, Open Day and Innovation Competition**. I thank the leadership of Bomet University for inviting me to grace this occasion, and I commend the University for sustaining this important academic forum over the years. I also warmly welcome all our distinguished guests, scholars, and partners to Bomet University and, by extension, to Bomet County. Your presence here affirms the growing visibility of our beloved county through Bomet University.

This conference marks another important milestone in the growth of Bomet University as an emerging centre of academic and research excellence. Universities are engines of research and innovation, and they

are custodians of knowledge. Platforms such as this provide fertile ground for breakthroughs and for finding sustainable solutions to societal challenges through interdisciplinary and multidisciplinary engagement.

To consolidate the gains already made, the national government remains committed to supporting research, innovation, and technology. This commitment is reflected in the recent creation of the **State Department for Science, Research and Innovation** under the Ministry of Education. This decision by our President, **H.E. Dr. William Samoei Ruto**, will undoubtedly strengthen the research and innovation ecosystem in the country as we continue to respond to international commitments such as the **Sustainable Development Goals (SDGs)**, the **Science, Technology and Innovation Strategy for Africa (STISA) 2024**, and the **African Union Agenda 2063**. I am therefore delighted that this conference, under the theme “**Artificial Intelligence as a Transformative Technology: Unlocking the Opportunities for Sustainable Development**,” is timely and relevant.

Ladies and Gentlemen, I wish to reiterate the commitment of the County Government of Bomet to continue supporting the aspirations and endeavours of Bomet University. I am glad to note that the recently signed **Memorandum of Understanding (MOU)** between the County Government of Bomet and Bomet University is a clear indication that our collaboration will go a long way in advancing joint research and in generating solutions that will positively impact our society and our county.

Finally, I congratulate the leadership of Bomet University for its visionary and transformative leadership, which has positioned this young university on the global stage. **Hongera!**

I take this opportunity to wish all participants a fruitful engagement and a pleasant stay in Bomet County. It is now my great honour to officially declare the **1st Bomet University Annual Conference** officially open.

Thank you, and God bless you.

MESSAGE FROM THE VICE CHANCELLOR

**PROF. CHARLES MUTAI**

It is my great pleasure to welcome you to Bomet University and, more especially, to today's conference. I am confident that, by the end of this event, you will agree that the University is firmly pursuing its chosen niche of **"Green Economy for Sustainability."**

Bomet University has consistently invested in research, innovation and knowledge exchange through its annual conferences. In the **2021/2022 financial year**, the University held its inaugural international conference under the theme **"Towards a Sustainable Green Economy,"** during which **33 papers** were presented. This was followed

by the **2022/2023 conference**, themed **"Building on Institutional Resilience for Sustainable Development,"** which attracted **47 papers**. The **2023/2024 conference**, under the theme **"Research, Innovation and Outreach: Green Solutions for Sustainable Growth,"** featured **49 papers**. In the **2024/2025 financial year**, **53 papers** were presented at the fourth conference, themed **"Research, Innovation and Outreach: Commercialization for Sustainability."**

The lessons and best practices from these earlier conferences have informed the planning and organisation of this year's conference, which is themed **"Artificial Intelligence as a Transformative Technology: Unlocking Opportunities for Sustainable Development."**

I am pleased to inform you that this conference has attracted the highest number of papers yet, with 75 reviewed papers accepted for presentation by authors from diverse academic backgrounds. This clearly demonstrates the growing interest in artificial intelligence among scholars, researchers, innovators, and industry players. Artificial intelligence is indeed increasingly shaping the future.

It is important to note that all the papers to be presented in this conference have undergone a rigorous review process and each satisfies the scholarly standards that we continue to uphold at the University.

I encourage all of you to take full advantage of this opportunity for meaningful engagement on how artificial intelligence can be used to unlock opportunities for sustainable development.

Ladies and Gentlemen, the Management of Bomet University remains committed to supporting research and innovation. We recognise the critical role that research and innovation play in achieving both national and global development goals. Despite limited resources, we continue to allocate the required 2% of our operational budget to Research, Science, Technology, and Innovation (RSTI) activities, in line with the Science, Technology and Innovation Act, 2013. Our commitment to implementing the national STI strategy is reflected in our consistent excellent rating by the National Commission for Science, Technology and Innovation (NACOSTI).

Such achievements would not be possible without the unwavering support we have continued to receive from the Government, the Ministry of Education, the Bomet University Council, and the County Government of Bomet. I sincerely thank you all.

Finally, I wish to thank our Chief Guest, all other guests, the keynote speakers, and all participants for taking the time to join us on this important occasion in our University calendar.

With these few remarks, I warmly welcome you all to this auspicious inaugural Conference, Open Day and Innovation Competition marking a new page for our newly chartered University!

We wish all the participants a rewarding conference experience!

Thank you!



CHIEF GUEST

H.E. PROF. HILLARY BARCHOK GOVERNOR, BOMET COUNTY

Prof. Hillary Kipng'eno Barchok is the current Governor of Bomet County. He started his academic journey in Kapkilomwa Primary School in 1981 before proceeding to Kericho High School for secondary school education. He holds a Bachelor of Education (Science) degree from Egerton University, Njoro and a Master of Education (Science Education) from the same institution. Prof. Barchok is also an alumnus of Moi University where he obtained a Doctor of Philosophy (PhD) degree in Curriculum Development. He has several years' experience in academia having worked as a lecturer in Chuka University where he taught and supervised students in different fields of education. He is a curriculum development specialist who before joining politics, was serving as the dean of Faculty of Education and Resource Development (FERD) between 2012 and 2017. Before joining Chuka University as a lecturer, Prof. Barchok taught Chemistry and Mathematics in various secondary schools as a Teachers Service Commission (TSC) teacher.

CONFERENCE PAPER PRESENTATION SCHEDULE**SUB-THEME ONE: ECONOMIC TRANSFORMATION THROUGH ARTIFICIAL INTELLIGENCE****– BREAK AWAY ROOM 1****DAY 1: APRIL 8, 2026**

S/N O	TIME	TITLE	AUTHOR
1.	2:00-2:15PM	Financial literacy and entrepreneurial intention among undergraduate students in Kenya. The role of attitude towards artificial intelligence and self- efficacy.	Clement Gichunge Nkaabu & Robert Sangura
2.	2:15-2:30PM	Influence of valuation of assets and liabilities on Quality of Financial Reporting in Public Universities in Kenya: The Moderating Role of University Size	Lumatete Irine Nanzala, Muli Maingi & Mary Nelima
3.	2:30-2:45PM	Assessment of the Development of Artificial Intelligence Capabilities in Accounting and Finance Curriculum: A study of Bomet University, Kenya	Patrick B. Ojera & Victor K. Kirui
4.	2:45-3:00PM	Digital Financial Services and Household Credit Access in Kenya: Evidence from FinAccess Household Survey Data	Chepngeno E. Maina
3:00-3:30PM - PANEL SESSION			
5.	3:30-3:45PM	Household Characteristics, Financial Behavior, and Food Insecurity in Kenya: Evidence from the 2024 FinAccess Survey	Chepngeno E. Maina, & Gladys Nangila Hopillo
6.	3:45-4:00PM	The role of artificial intelligence in developing ancillary services to improve airline performance and mitigate trade and economic risks	Stellah Chebet Chepkwony
7.	4:00-4:15PM	Artificial Intelligence-Driven Analysis of Environmental, Social, and Governance (ESG) Disclosures and Financial Sustainability of Listed Firms in Kenya	Fredrick Olanga Wafula
8.	4:15-4:30PM	The Influence of Artificial Intelligence on MSMEs and Startups: A Systematic Review with Lessons for Sub-Saharan Africa	Cynthia Atamba, (Eng) John K Mosonik & Pius Bett
4:30-5:00PM - PANEL SESSION			

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END OF DAY ONE

Day 2: April 9, 2026

S/N O	TIME	TITLE	AUTHOR
9.	8:00-8:15 AM	Leveraging Artificial Intelligence for Risk Management in the Banking Industry: Enhancing Financial Performance through Intelligent Systems	Teclah Tuwei & Meshach K. Katam
10.	8:15-8:30 AM	The Role of Digital Transformation and Organizational Performance	Bett Samwel Kiptoo & Kaari Mercy Bii
11.	8:30-8:45 AM	Artificial Intelligence for Capital Market Regulation in Developed and Emerging Economies: A Critical Review of Literature	Michael Ochieng Obuya & Samuel O. Onyuma
12.	8:45-9:00AM	Ethical Dilemmas and Supervisory Challenges in the Use of Generative Artificial Intelligence in Postgraduate Research: A Qualitative Study of Kenyan Universities	Moses Raphael Ogola & Johnmark Obura
9:00-9:30AM - PANEL SESSION			
2:00 PM		CLOSING CEREMONY	

SUB-THEME TWO: SOCIAL TRANSFORMATION THROUGH ARTIFICIAL INTELLIGENCE - (EDUCATION)

Day 1: April 8, 2026

S/NO	TIME	TITLE	AUTHOR
1.	2:00-2:15PM	Gradient Boosting–Neural Network Hybrids for Early Detection of Dropout Risk in Online Learning Environments	Stanley Munga, James Mwikya & Victor Mageto
2.	2:15-2:30PM	Generative AI and Knowledge Creation: Transformative Opportunities and Ethical Dilemmas in Selected Universities, Kenya	Jane Chepng'eno Sang & Ednah Milgo
3.	2:30-2:45PM	AI Adoption, Digital Readiness, and Inclusive Education Outcomes in higher Institutions of Learning: Evidence from Moi University Using Hayes' PROCESS Model 4	Jane Chepngeno Sang & Emily C. Sitienei

4.	2:45-3:00PM	Harnessing Artificial Intelligence and Total Quality Management to Bridge Educational Inequality: A Strategic Framework for Sub-Saharan Africa."- Kenya.	Peris Cherotich Kerich
3:00-3:30PM - PANEL SESSION			
5.	3:30-3:45PM	Assessing the Potential of AI and Digital Learning Tools in Expanding Educational Opportunities for Marginalized Groups	Philip Bii, Nelly Mutai & Peter Mwai
6.	3:45-4:00PM	The Impact of AI on Curriculum Design and Educational Pedagogy	Philip Bii, Nelly Mutai & Peter Mwai
7.	4:00-4:15PM	Refugee Youth Access to Higher Education in Kenya: Mapping of the Literature and Synthesis of the Evidence	Tiberius Barasa
8.	4:15-4:30PM	Application of Artificial Intelligence in Mental Health Education in Primary and Junior Secondary Schools in Nyamira County	Michael Keari Omwenga Sakina Moraa Mogaka
4:30-5:00PM - PANEL SESSION			
END OF DAY ONE			

Day 2: April 9, 2026

9.	8:00-8:15 AM	Benefits and challenges of AI Chatbots Application in Higher Education.	Proscovior Vunyiwa & Kennedy Otiso
10.	8:15-8:30 AM	The Role of Artificial Intelligence in Teachers' Emotional Intelligence and Job Performance in Kenya	Nicholas Langat
11.	8:30-8:45 AM	Integration Of AI in Inclusive Education: A Systematic Review	Proscovior Vunyiwa & Kennedy Otiso
12.	8:45-9:00 AM	Influence of artificial intelligence on key entities in the education system as perceived by university students	Nebert Kevogo
9:00-9.30AM- PANEL SESSION			
13.	9:30-9:45AM	Readiness of higher institutions of learning in Kenya for the adoption and utilization of Artificial Intelligence: A Literature Review	Ouma Omito

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14.	9:45-10:00AM	Learning English in Higher Institutions in the Face of AI: Opportunities and Challenges: The Case of Bomet University College.	John Wayong'o
15.	10:00-10:15 AM	Integrating AI in School Management and its Effect on Core Competencies Attainment among Learners in Junior Schools in Bomet County, Kenya.	Gideon Kiprotich Ngeno
16.	10:15-10:30 AM	The Impact of Artificial Intelligence on Teacher Education in Kenyan Universities: A Critical Review	Polycarp Muchesia Ishenyi
10:30-11:00AM- PANEL SESSION			
11:00-11:30AM – HEALTH BREAK			
17.	11:30-11:45 AM	The Rising Interest in AI and Education: Opportunities and Risks to Future Teaching and Learning	John M. Momanyi, Robert J. Masinde & Winnie C. Chelangat
18.	11:45-12:00 NOON	Leveraging Artificial Intelligence in Management Planning and its	Lillian Kagendo William, Tony Okwach & Richard Sigilai
19.	12:00-12:15 PM	Generative AI in Geography Assessment: Transforming Geography Assessment in Higher Education Systems with AI in Sub-Sahara Africa	Fredrick Kayusi
20.	12:15-12:30 PM	The Influence of AI on Higher Education in Kenya: A Study on Student Adoption, Key Drivers, and Challenges	Salome Chepkorir
12.30-1.00 PM: PANEL SESSION			
1:00 -2:00 PM HEALTH BREAK			
2:00 PM		CLOSING CEREMONY	

SUB-THEME TWO: SOCIAL TRANSFORMATION THROUGH ARTIFICIAL INTELLIGENCE - (SOCIAL SCIENCE)

Day 1: April 8, 2026

S/NO	TIME	TITLE	AUTHOR
1.	2:00-2:15PM	AI and Historical Knowledge Production	Some Josephine Chemutai
2.	2:15-2:30PM	An investigation of the Future of Artificial intelligence as a Transformative Technology: Unlocking the opportunities for Sustainable Development	Winnie Chebet - social
3.	2:30-2:45PM	AI Companions and Psychological Risks of Overdependence Among University Students	Waweru Muriithi & Peter Muchemi
4.	2:45-3:00PM	Application of Artificial Intelligence in Primary and Junior Secondary School to Support Students' Mental Health and Well-Being in Kisii County, Kenya.	Mweti Jocelyn kathure, Michael Keari Omwenga & Andrew Furaha Charo
3:00-3:30PM - PANEL SESSION			
5.	3:30-3:45PM	The Relevance of Artificial Intelligence in Societal Transformation and Inclusion: A Historical Purview	Joyce Chepkwony
6.	3:45-4:00PM	Psychological Issues associated with Artificial Intelligence (AI) among University Students in their Pursuit of Academic Success. A Review	Mettoh Jephchirchir Hellen
7.	4:00-4:15PM	Akiliunde (AI) Na Ufunzaji Katika Karne Ya 21: Mfumo Wa Cbe Nchini Kenya	Florence M. Anyonje
8.	4:15-4:30PM	Impact of Generalized Anxiety Disorder on Academic Performance and Experiences among Kenyan Undergraduate Students	Lucy Wangechi Ngundo, Anthony Gathambiri Waiganjo & Liane M. Ngugi
4:30-5:00PM - PANEL SESSION			
END OF DAY ONE			

Day 2: April 9, 2026

9.	8:00-8:15 AM	Nafasi ya Akili Bandia(AI) katika kuboresha ujifunzaji wa Lugha ya Kiswahili katika shule za Kenya.	Kirui Simon Kipko ech
10.	8:15-8:30 AM	Who does AI serve? Rethinking Artificial Intelligence through African Feminist Intersectionality	Anthony Waiganjo & Nancy Barasa
11.	8:30-8:45 AM	AI- Powered Generation: Redefining the Grief Process among the Luo Community of Western Kenya and Its Implication in Mental Health Management	Caroline Akoth Onywany & Mohamed Mraja
12.	8:45-9:00 AM	Social Media Influence on Thinking and Behaviour among the Youth in Kenya.	Kesui, Hellen C & Muchemi, Peter
13.	9:00-9:15AM	Faith in the Age of Artificial Intelligence: Cultural and Religious Implications for African Societies	Rebecca Jepkemei Lagat (PhD)
9:15-9:45AM- PANEL SESSION			
11:00-11:30AM – HEALTH BREAK			
2:00PM		CLOSING CEREMONY	

SUB-THEME THREE: GENERAL AND CROSS CUTTING ISSUES**Day 1: April 8, 2026**

S/NO	TIME	TITLE	AUTHOR
1.	2:00-2:15PM	Factors associated with the Use of Artificial Intelligence for Quality Healthcare Delivery in Burundi	Elysee Nibitanga, Alexander M Mbeke & Fabrice Irakoze
2.	2:15-2:30PM	The Role of Artificial Intelligence in Shaping Environmental Science and Environmental Physics: Equations, Simulations, and Emerging Frontiers	Joseph K. Maritim
3.	2:30-2:45PM	Ethical Implications of Artificial Intelligence and Machine Learning in Academic Libraries in Kenya	Lucy Sang
4.	2:45-3:00PM	Coping Strategies and Food Insecurity Among Marachi Smallholder Farmers in Butula Sub-County	Gladys Nangila Hopillo, Precious Joan Wapukha & Charity Iruma Irungu

3:00 - 3:30 PM PANEL DISCUSSION			
5.	3:30–3:45PM	AI-Integrated with Digital Holographic Microscopy for Real- time Monitoring of Antibiotic Susceptibility.	Titus Gikuni, Kihara, Jack kihiko & Ahzar Mohamed
6.	3:45-4:00PM	A Model for AI Dataset Inclusivity for Africa	Odero, F. A.
7.	4:00-4:15PM	Machine Learning Integrated Optical Sensor and Microcontroller System to Detect Heavy Metals.	Esther Wang'ombe, Titus Gikuni, Jack kihiko, Stephen Kinyua, Agrey Mukoya & Julius Kirui
8.	4:15-4:30PM	Influencing Information Seeking Behavior Among the Students of Bomet University with an Artificially Intelligent Conversational Agent	Kipngetich Ngeno Mathew
4:30-5:00PM - PANEL SESSION			
END OF DAY ONE			

Day 2: April 9, 2026

9.	8:00-8:15 AM	Harnessing Artificial Intelligence for Climate-Smart Environmental Monitoring and Agricultural Decision Support in Kenya's Highlands	Timothy Kiprop and Richard Rotich
10.	8:15-8:30AM	Application of Artificial Intelligence on Ambulance Transportation Network for Health Care System in the Remote Areas	Simon Shitsinzi
8:30 – 9:00 PM PANEL DISCUSSION			
2:00 PM		CLOSING CEREMONY	

Artificial Intelligence in Competency-Based Education in Kenya: Opportunities, Challenges, and Policy Pathways

David Muchangi Mugo, PhD

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Abstract

Artificial intelligence (AI) is rapidly transforming education worldwide, offering opportunities for personalized learning, automated assessment and efficient school management. Kenya, currently undergoing a major curriculum reform through the Competency-Based Education (CBE), is witnessing growing interest in AI adoption across primary, secondary and tertiary education. However, the deployment of AI tools in Kenya is marked by uneven readiness, limited infrastructure, data governance challenges and equity concerns. This paper examines the influence of AI in Kenya's education sector by analyzing policy frameworks, teacher readiness and early AI applications. Using a qualitative thematic review of policy documents, empirical studies and practitioner reports, the study identifies significant opportunities to enhance CBE competencies, reduce teacher workload and support inclusive education. Yet, risks such as student data misuse, algorithmic bias, digital divides and low teacher preparedness threaten sustainable implementation. The findings highlight that, despite Kenya having a progressive legal framework through the Data Protection Act (2019), sector-specific guidance by the Office of the Data Protection Commissioner (ODPC), and a National Artificial Intelligence Strategy (2025–2030), implementation and enforcement remain weak. Recommendations include strengthening teacher professional development, aligning AI tools with CBE goals, mandating data protection impact assessments and investing in local language datasets. By adopting a holistic governance framework, Kenya can harness AI for equitable and ethical education transformation.

Keywords: Artificial intelligence; education technology; Competency-Based Education; teacher readiness; data governance; personalized learning

Gradient Boosting–Neural Network Hybrids for Early Detection of Dropout Risk in Online Learning Environments

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Abstract

The accurate prediction of learner dropout in e-learning is essential in order to improve student retention and increase the efficiency of online education. This study aimed to develop an ensemble-based machine learning model for the prediction early learner attrition in Kenyan online learning environments. Achieving a high accuracy of learner attrition prediction in e-learning is relevant to enhancing learner retention and success of online learning. The purpose of this research was to develop an ensemble machine learning model to predict learners at risk of discontinuing their online education. The research objectives included Analyzing existing studies and identify significant factors that influence learner attrition in online learning environments, developing an ensemble model integrating XGBoost, Neural Networks, Decision Trees, and Random Forests, and validating the model's performance through empirical evaluation. Secondary data from the Learning Management Systems (LMS) of Mount Kenya University, Daystar University, Zetech University, KCA University, Dedan Kimathi University and Kirinyaga University were used. This data comprised learner demographics, academic records, and enrolment patterns. Accuracy, precision, recall, F1-score, AUC-ROC metrics were used to evaluate the performance of the model. The overall model achieved accuracy of 97.2%, outperforming individual models: Decision Trees (95.87%), Random Forests (91.01%), Gradient Boosting (96.91%) and Neural Networks (96.66%). These findings illustrated the model's strong capacity to make accurate early identification of at-risk learners hence facilitating timely interventions. The study results provide insights for universities and policymakers to enhance student retention and improve the delivery of online education reducing dropout rates through data-informed decision-making.

Keywords: Learner attrition, E-learning, engagement metrics, Machine learning, Ensemble model.

Generative AI and Knowledge Creation: Transformative Opportunities and Ethical Dilemmas in Selected Universities, Kenya

Dr. Jane Chepng'eno Sang (Corresponding Author) — *Open University of Kenya* Email: jsang@ouk.ac.ke and Dr. Ednah Milgo — Email: emilgo@ouk.ac.ke Abstract

Abstract

The rapid emergence of Generative Artificial Intelligence (Generative AI) has disrupted knowledge creation processes in higher education globally, offering transformative opportunities while raising significant ethical dilemmas. This study, guided by Hayes' PROCESS Model 59, examined four objectives: assessing the direct effect of Generative AI use on knowledge creation in selected Kenyan universities; testing the mediating role of academic integrity; investigating the moderating role of institutional policy frameworks; and evaluating the conditional indirect effects of Generative AI on knowledge creation at different levels of institutional policy strength. Using a mixed-methods approach with data from 312 faculty and postgraduate students across five universities, the findings revealed that Generative AI significantly enhanced efficiency in research, academic writing, and interdisciplinary innovation ($\beta = .42, p < .01$), while academic integrity partially mediated this relationship through challenges such as plagiarism, authorship disputes, and over-reliance on AI (indirect effect $\beta = -.18, p < .05$). Strong institutional policies were shown to amplify positive outcomes and mitigate ethical risks (index of moderated mediation = .12, 95% CI [.04, .23]). Overall, the results highlight the dual role of Generative AI as both an enabler and disruptor of knowledge creation, with the study offering timely insights to guide universities and policymakers in fostering innovation while safeguarding academic integrity and institutional credibility.

Keywords: Generative Artificial Intelligence, Knowledge Creation, Academic Integrity, Institutional Policy, Higher Education, Hayes PROCESS Model 59

Artificial Intelligence Adoption, Digital Readiness, and Inclusive Education Outcomes in Kenya: A Case of Moi University

Dr. Jane Chepng'eno Sang (Corresponding Author) — *Open University of Kenya* Email: jsang@ouk.ac.ke and Prof. Emily Sitienei — Email: emibensi@gmail.com

Abstract

The rapid integration of Artificial Intelligence (AI) in higher education presents both transformative opportunities and emerging challenges for achieving equity and access in Kenya. This study investigates the mediating role of digital readiness in the relationship between AI adoption and inclusive education outcomes within Kenyan higher learning institutions. Guided by an explanatory research design and Hayes' PROCESS Model 4, the study employed a cross-sectional survey targeting both academic staff and students at Moi University, with a total population of approximately 22,000 (20,000 students and 2,000 staff). Using stratified random sampling, a representative sample of 378 respondents was determined through Cochran's formula at a 95% confidence level and a 5% margin of error. Findings revealed that AI adoption is positively correlated with both inclusive education outcomes ($r = .46, p < .01$) and digital readiness ($r = .51, p < .01$), while digital readiness itself strongly predicts inclusivity ($r = .49, p < .01$). Mediation analysis confirmed that digital readiness accounted for 38% of the total effect of AI adoption on inclusivity (indirect effect $\beta = .16, CI [.09, .24]$), while the direct effect of AI adoption remained significant ($\beta = .26, p < .01$). The study concludes that AI adoption significantly promotes inclusivity in higher education; however, its effectiveness is contingent upon institutional digital preparedness. Enhancing digital readiness through policy alignment, investment in ICT infrastructure, and digital literacy capacity-building for staff and students is vital for equitable access and sustainable digital transformation in Kenyan universities. This research enriches the discourse on AI-driven inclusive education and provides empirical insights to guide evidence-based policy and strategic interventions in the African higher education context.

Keywords: Artificial Intelligence, Inclusive Education, Digital Readiness, Higher Education, Kenya, Hayes PROCESS Model 4.

Harnessing Artificial Intelligence and Total Quality Management to Bridge Educational Inequality: A Strategic Framework for Sub-Saharan Africa-Kenya.

Peris Cherotich Kerich, periskerich@gmail.com. A student Bomet University,

Abstract

Educational inequality remains a pressing issue across Sub-Saharan Africa, particularly in rural and marginalized communities where access to quality learning resources is limited. This study explores the synergistic potential of Artificial Intelligence (AI) and Total Quality Management (TQM) in addressing these disparities within the Kenyan education system. While AI offers transformative tools—such as personalized learning platforms, automated assessments, and intelligent tutoring systems—its implementation often lacks strategic oversight and quality assurance. TQM, a proven framework for continuous improvement and stakeholder engagement, provides a structured approach to enhance the effectiveness, equity, and sustainability of AI integration in education. Using a mixed-methods research design, the study investigates current AI applications in selected Kenyan schools, evaluates their impact on learning outcomes, and analyzes stakeholder perceptions. It also identifies key barriers to aligning AI deployment with TQM standards, including infrastructure limitations, data quality issues, and ethical concerns. The findings culminate in a strategic framework that combines visionary leadership, inclusive stakeholder engagement, robust infrastructure, and ethical governance to guide the responsible and impactful integration of AI and TQM in education. This research contributes to academic discourse, informs policy development, and offers a replicable model for other Sub-Saharan regions seeking to harness technology for educational equity and excellence.

Factors Associated with the Use of Artificial Intelligence for Quality Healthcare Delivery in Burundi

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Abstract

Artificial Intelligence (AI) holds immense potential to transform healthcare delivery in Burundi by enhancing disease diagnosis, treatment, and health system management. However, the effectiveness of AI adoption depends on the robustness of **Data Request and Information Utilization (DRIU)** mechanisms that underpin evidence-based decision-making. This study examines the association between DRIU factors including structured feedback, training, reporting mechanisms, and meeting frequency, and their implications for AI readiness and quality healthcare delivery in Burundi's public health facilities. A **cross-sectional mixed-methods design** was employed using data from 168 healthcare workers in Kiganda Health District. Regression analysis revealed that feedback on complaints ($p = 0.015$), reporting mechanisms ($p = 0.013$), data collection methods ($p = 0.026$), training ($p = 0.022$), and meeting frequency ($p = 0.047$) significantly predicted effective data use. These findings indicate that functional DRIU systems enhance institutional capacity to generate, analyze, and apply health data, creating a strong foundation for AI integration. Despite this potential, barriers such as limited infrastructure, low digital literacy, weak data governance, and restricted internet connectivity continue to constrain equitable adoption of AI-driven tools. Strengthening policy frameworks, investing in human resource capacity, and improving digital infrastructure are therefore essential for fostering AI-enabled, equitable, and sustainable healthcare transformation in Burundi. The study concludes that leveraging AI alongside robust DRIU mechanisms can catalyze evidence-based decision-making, improve health outcomes, and accelerate progress toward resilient and data-driven healthcare systems.

Keywords: Artificial Intelligence (AI), Data Request and Information Utilization (DRIU), Quality Healthcare Delivery, Health Systems, Health Information Systems, Enabling Factors.

Ethical Implications of Artificial Intelligence and Machine Learning in Academic Libraries in Kenya

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ABSTRACT

Use of artificial intelligence (AI) and machine learning (ML) in academic libraries is gaining popularity with the promise of enhancing efficiency and delivery of services. Job loss caused by automation, discrimination and bias, privacy and security, and the absence of human contact when delivering services are some of the serious ethical issues and problems when using these AI technologies. The main objective to investigate the ethical consequences of AI and ML with focus on user experience, data-informed decision-making, library ethics and library effectiveness. The study adopted convergent research design and mixed-method research approach (MMR) in the analysis of the application of AI innovations by academic libraries. Stratified random and convenience sampling was applied. Questionnaires and interviews were conducted among 207 selected participants who were students and library staff from two sampled Kenyan academic libraries, and in addition document content analysis were reviewed. The collected data was processed by descriptive and thematic statistical analysis using SPSS version 27. The findings indicated, 85% of respondents to the research agreed that AI makes their library experience better, indicating a robust positive relationship between user satisfaction and AI use in academic libraries and 88% had strong opinion AI improvement in academic library services. However, only 41% of the participants were confident in ethical data processes, demonstrating the need for transparency and training in integrating AI, while 79% agreed in AI training. The negative coefficient ($\beta = -0.27$) suggests that a higher awareness of privacy hazards is linked to a lower level of user confidence in AI systems. More application of AI then further improves the level of operational efficiency in library services, as indicated by a coefficient of 0.53. The study recommends increasing user trust and supporting responsible handling of data by using strong ethical standards and emphasizing openness of AI systems.

Keywords: Artificial intelligence (AI), Technologies, Universities, Library, Ethics

SOCIAL TRANSFORMATION THROUGH AI:AI AND HISTORICAL KNOWLEDGE PRODUCTION

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ABSTRACT

Artificial Intelligence (AI) is fundamentally transforming how historical knowledge is produced, preserved and shared with profound implications on culture, identity and social transformation. AI enables large-scale digitization of data, intelligent archiving and immerse historical reconstructions, enabling communities to reclaim suppressed or marginalized histories. However, this transformation also presents challenges, including algorithmic bias and potential erasure and marginalization of diverse narratives. This study explore how generative AI is changing the way historians perceive, write and disseminate historical knowledge and to explore the threats and consequences of scientists augmenting history with AI. Data collection was done through document analysis of datasets on historical contexts from interactions with AI tools such as ChatGPT-4o, Meta AI and interviews with historians interacting with AI in historical research. The study makes use of the Social Construction of Technology and Cultural Memory Theory to mediate the relationship between technology, culture and history offering a comprehensive approach to examining both the opportunities and challenges AI introduces in historical knowledge production. Key findings indicate that AI has introduced new ways of collecting, preserving and interpreting historical data redefining how societies shape their cultural heritage. Machine learning algorithms, natural language processing and computer vision are increasingly being used to digitize artefacts, reconstruct historical sites, analyze large sets of data and even generate narratives about the past. However, the use of these technologies also raises significant concerns. AI systems are often developed within limited cultural frameworks, predominantly influenced by Western values creating the risks of cultural homogenization. Furthermore, algorithmic bias may perpetuate historical inequalities, erasing marginalized voices in how history is recorded, preserved and remembered. The study suggests the need for more rigorous regulations through development of inclusive, context-sensitive technological frameworks that supports cultural diversity, historical justice while mitigating against marginalization.

Keywords: Artificial Intelligence, Historical Knowledge, Social Transformation, Cultural Heritage, Marginalization

Assessing the Potential of AI and Digital Learning Tools in Expanding Educational Opportunities for Marginalized Groups

Prof. Philip Bii, Dr. Nelly Mutai and Peter Mwai – BOMET UNIVERSITY

Abstract

Access to quality education remains a significant challenge for marginalized groups, including those in rural areas, low-income communities, and individuals with disabilities. These groups often face barriers such as limited infrastructure, socio-economic disparities, and geographic isolation, which impede their ability to access educational opportunities. Digital learning tools and Artificial Intelligence (AI) have the potential to address these barriers by offering personalized, accessible, and flexible learning experiences. However, the extent to which these tools can expand educational opportunities for marginalized groups has yet to be fully assessed. This study aims to explore the potential of AI and digital learning tools in bridging the education gap for marginalized groups, focusing on the challenges, opportunities, and effectiveness of these technologies. The purpose of this study is to assess how AI and digital learning tools can be leveraged to enhance educational accessibility and outcomes for marginalized groups. Specifically, the research will investigate how these technologies can be tailored to address the unique needs of learners in underserved communities. The study will also evaluate the effectiveness of existing AI-driven educational tools in these contexts. The study will adopt a mixed-methods research design, combining qualitative and quantitative data collection. Surveys and interviews will be conducted with educators, policymakers, and learners from marginalized communities to gather insights into the effectiveness of digital learning tools and AI in enhancing educational opportunities. Theoretical frameworks guiding the study will include the Social Capital Theory, which emphasizes the role of social networks in education, and the Capability Approach, which focuses on expanding the freedoms and opportunities available to individuals. The target population for this research will include students, educators, and administrators from marginalized communities in both rural and urban settings. Simple random sampling will be employed to select participants, and the data will be analyzed using both descriptive and inferential statistics to draw meaningful conclusions about the role of AI in improving education for these groups.

Keywords: marginalized groups, digital learning tools, AI, accessibility, personalized learning, rural areas, underserved communities, learning outcomes.

The Impact of AI on Curriculum Design and Educational Pedagogy

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Abstract

Curriculum design and educational pedagogy are critical elements in shaping effective learning experiences for students. However, traditional approaches to education often fail to fully address the diverse needs of learners, especially in the context of rapid technological advancements. Artificial Intelligence (AI) presents an opportunity to revolutionize curriculum design and pedagogy by offering personalized, adaptive, and data-driven learning experiences. Despite the promise of AI, its impact on curriculum development and educational teaching practices remains underexplored. This study aims to assess how AI can influence and enhance curriculum design and educational pedagogy, focusing on the opportunities, challenges, and potential improvements it brings to teaching and learning processes. The purpose of this research is to investigate the integration of AI in curriculum development, how AI can shape instructional methodologies, and its impact on both educators and learners. The study will also examine the effectiveness of AI-powered tools in fostering personalized learning and improving pedagogical approaches. A mixed-methods research design will be used, incorporating both qualitative and quantitative data collection methods. Surveys and interviews will be conducted with educators, curriculum developers, and students to gather insights into how AI influences teaching practices and curriculum design. Theoretical frameworks guiding this study include Constructivist Learning Theory, which emphasizes learner-centered approaches, and Technological Pedagogical Content Knowledge (TPACK) framework, which integrates technology, pedagogy, and content knowledge. The target population will consist of educators, instructional designers, and students across various educational settings. Data will be analyzed through both descriptive and inferential statistics, aiming to provide a comprehensive understanding of AI's role in transforming curriculum design and pedagogy.

Keywords: AI, curriculum design, educational pedagogy, personalized learning, teaching practices, instructional methodologies, technology integration, learning outcomes.

Influence of Valuation of Assets and Liabilities on Quality of Financial Reporting in Public Universities in Kenya: The Moderating Role of University Size

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Abstract

Institutions need to report their financial status regularly over a prescribed period so as to enable the stakeholders be aware of their performance. According to IPSASB, a key component for quality financial reporting is the strict adherence to the objective and the specific qualitative characteristics of financial reporting information, which will lead to stakeholder confidence. This is because the quality of any financial report is of high concern to both the final users and the society since it has an effect on the economic decisions that could have a direct impact to the society. This has led some institutions to use creative accounting. Quality of the financial reports was measured in terms of the type of audit opinion by the Office of the Auditor General. The objective of this study was to determine effect of revenues recognition as well as to determine the moderating effect of firm size on the relationship between revenues recognition and the quality of financial reporting in public universities in Kenya. The study was guided by information asymmetry theory. The study adopted the positivist research philosophy while the research design was causal research design. Population of this study was 36 public universities in Kenya. The study target population was 866 respondents where stratified random sampling technique was used resulting in a study sample of 274 respondents was drawn using Yamane formula. Data was collected using questionnaires and interview schedule. Secondary data was collected in regard to type of opinion and size of the university using approved budgets. Data was analyzed using descriptive statistics including mean, frequency, percentages and standard deviation. Inferential statistics consisting of correlation analysis and linear regression analysis. Data was presented using tables, charts and graphs. Regression showed that creative accounting in valuation of assets and liabilities had a significant negative effect on quality of financial reporting in public universities in Kenya. Hierarchical regression results showed firm size had a significant moderating effect on the relationship between valuation of assets and liabilities and the quality of financial reporting. The study concluded that valuation of assets and liabilities has a significant negative effect on the quality of financial reporting and university size plays significant moderating effect on this relationship. The study recommends stricter adherence to International Public Sector Accounting Standards (IPSAS) and International Financial Reporting Standards (IFRS) across universities to reduce subjectivity in valuation practices. Smaller institutions should be supported with resources, staff training, and stronger internal controls to enhance reporting quality, while larger universities should adopt advanced technologies to manage complex transactions and reduce manipulation risks.

Keywords: Valuation of assets and liabilities, Quality of Financial Reporting, Public Universities, University size, Creative Accounting Techniques

Assessment of the Development of Artificial Intelligence Capabilities in Accounting and Finance Curriculum: A study of Bomet University, Kenya

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Abstract

With the launch of ChatGPT in 2022, Generative Artificial Intelligence (GenAI) has had a profound effect on learning outcomes in higher education. Accounting and finance education and profession is one area prone to be negatively impacted by technological advancement, particularly in Africa. Previous research has focused on institutions and less on disciplinary teaching areas, particularly accounting and finance. Based on this, in pursuit of the need to adopt the accounting and finance education in universities to intelligent accounting talents, this study focuses on the analysis of the problems existing in the current accounting and finance practice teaching in the context of artificial intelligence from the perspective of practical teaching reform. The study also explores the new direction of accounting and finance teaching reform from the aspects of teaching content, teaching environment, teaching staff and teaching evaluation system. Guided by the Technology Adaption Model (TAM) Theory and focusing on Bomet Univesity Collage, Kenya, the study employs a qualitative methodology and literature review to assess current practice, opportunities and challenges in teaching and learning in accounting and finance. Given the widely acknowledged transformative potential of artificial intelligence, this study is timely and significant for students educators, policy makers, and researchers in harnessing capabilities of education for national development.

Keywords: Artifical Intelligence; Accounting and Finance; transformative education Technology Adaption Model (TAM) Theory; Opportunities; Challenges

Digital Financial Services and Credit Access in Kenya: Evidence from FinAccess Household Survey Data

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Abstract

Despite Kenya's global reputation as a pioneer in mobile money innovations, large segments of the population still face barriers in accessing and effectively using digital financial services. While digital products such as M-Pesa, Fuliza overdrafts, Hustler Fund loans, loan apps, and mobile banking credit have expanded financial access, concerns remain about financial exclusion, and inequalities in access to credit. The purpose of this study was to determine the correlates of digital financial services and credit access in Kenya guided by two objectives: to examine the relationship between mobile money usage and household access to digital credit in Kenya, and to analyze the influence of digital loan products on influence household borrowing patterns in Kenya. The research employed a quantitative methodology using FinAccess Household Survey data. The analysis of data was conducted utilizing the Statistical Package for Social Sciences, employing both descriptive and inferential statistics. Correlation analysis results revealed that all digital lending channels demonstrated robust and statistically significant positive relationships with credit availability ($p = 0.000$), with the Hustler Fund loan ($r = 0.837$) and mobile carrier loans ($r = 0.806$) exhibiting the strongest links. Regression analysis indicated that 45.8% of the variance in credit access is accounted for by the four digital lending variables ($R^2 = 0.458$, $F = 5884.561$, $p = 0.000$), with digital loans ($\beta = 0.571$, $p = 0.000$) having the most significant effect, succeeded by Hustler Fund, mobile provider, and mobile banking loans. The study concludes that Kenya's digital finance ecosystem significantly enhances household credit opportunities, while advising policymakers and financial institutions to bolster digital credit infrastructure, promote financial literacy, and guarantee equitable, affordable, and transparent lending practices to encourage inclusive financial growth.

Keywords: Digitization, Digital credit, Digital Financial Services, Credit access, Household Credit Access

Who does AI serve? Rethinking Artificial Intelligence through African Feminist Intersectionality"
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 & Dr. Nancy Barasa, Bomet University, School of Arts & Social sciences, Bomet University

ABSTRACT

Artificial Intelligence (AI) is frequently celebrated as a universal force of progress—objective, data-driven, and poised to transform Africa and entire globe. However, beneath this seductive narrative lies a critical question that is rarely asked. **Who is AI really serving?** And perhaps more urgently: **Who is it leaving behind?** This work interrogates the myth of AI neutrality by rethinking the design, deployment, and discourse of artificial intelligence through the lens of **African feminist intersectionality**. This work, anchored in a framework that understands identity as shaped by the entwined forces of gender, race, class, geography, and colonial history, African feminist thought offers a powerful vantage point from which to critique the global AI agenda. In centering the lived experiences of African women and other historically marginalized communities, this work depicts how technologies of AI mirrors and even magnify structural gendered inequalities embedded in data, institutions, and global power relations. From biased facial recognition systems to extractive data economies and exclusionary development agendas, the paper explores how artificial intelligence is not only replicating existing oppressions, but also extending them into the future of digital that are being imagined without the voices of those marginalized women that it affects. It draws from critical technology studies, decolonial theory, and African feminist scholarship to challenge the assumptions of universality and progress that underpin dominant AI narratives. Rather than rejecting AI outright, this work calls for a radical reimagining: one where technology is rooted in justice, designed with accountability, and shaped by the voices, visions, and knowledges of African communities—especially women and gender-diverse people. It proposes a transformative agenda for AI that moves beyond “inclusion” toward **decolonization, empowerment, and redistribution**. This paper ultimately, asks a critical and fundamental question that AI engineers, scholars technologists, policymakers, can no more afford to overlook: **Whose future is being programmed—and who gets to decide?**

Key Words: African Women, Artificial intelligence, Exclusion, Feminist intersectionality, marginalization, Power, Intelligence.

Application of Artificial Intelligence in Mental Health Education in Primary and Junior Secondary Schools in Nyamira County

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ABSTRACT

The unexpected growth in students' psychological needs, the need to enhance the screening rate for behavioral issues, the fact that students are guarded and lack of initiative have emphasized the barriers facing school mental health services. The purpose of the study is to examine the accessibility and quality of mental health services through high technologies and new cognitive models, with the aim of improving the screening and support of students' psychological needs in primary and junior secondary schools in Nyamira County, Kenya. A mixed-methodologies design that incorporates both quantitative and qualitative approaches was used. The study population was students in primary and junior secondary schools in the Nyamira County, Kenya. Stratified random sampling was used sample 500 students. Data was collected using structured questionnaires, interviews and focus group discussions. Quantitative analysis involved using statistical packages such as SPSS version 27 to perform descriptive and inferential statistics. The results indicated an increase in the rates of mental health screening and detection among students following the implementation of AI-facilitated methods, with screening participation rising from 26% to 77% of students detected with depression, anxiety, and behavior problems being high. Depression detection increased from 29% to 56%, anxiety and stress detection levels rose from 37% to 69% and 33% to 71%, respectively, illustrating the effectiveness of technology in addressing students' mental health needs. The study recommends that schools be compelled to actively integrate AI-based mental health screening tools to enhance early identification and intervention of students with psychological problems.

Keywords: psychological needs, behavioral issues, mental health, screening

The Use of Artificial Intelligence in Climate Modeling and Emerging AI Tools for Climate Adaptation, Mitigation, and Resilience

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Abstract

Artificial intelligence (AI) has become an increasingly important tool in climate science, offering the capacity to analyze large datasets, improve predictive skill, and support climate adaptation, mitigation, and resilience. Traditional climate models, while robust, face computational and temporal limitations that restrict their resolution and accuracy. AI approaches, including deep learning, generative modeling, and reinforcement learning, have shown significant promise in improving model calibration, down-scaling, and forecasting extreme events. This paper presents a comprehensive analysis of AI applications in climate modeling, reviews the emerging tools that enhance adaptation and mitigation strategies, and runs simulations to compare AI-enhanced forecasting against baseline climate models. The results demonstrate improved forecast skill, calibration, and economic efficiency when AI-based methods are applied. Findings suggest that integrating AI into climate science can provide trans-formative pathways for both scientific discovery and practical climate resilience planning.

Keywords: artificial intelligence, climate modeling, climate resilience, mitigation, adaptation, machine learning

Transportation Network for Health Care System in the remote areas.

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Abstract

Artificial intelligence has been a benefiting change in various sectors it is strengthening transport network company (TNC) to promote business, they have a potential applications for the vehicle to deliver transport service majorly embracing support for human interactions, Transportation network company referred to ride-sharing app based on demand ride services example the uber-style, has increased globally, emerging issues to tackling sustainability of urban mobility with the advantage of reliability and convenience. The accessibility to transportation for health care services example the need of ambulances to transverse the large distances between residences and health centers in the remote settings remains a challenge globally, cases of emergencies resulting from accidents, maternal health problems can be transferred to health facilities easier compared to normal tradition ambulance operations. Study solved the question from the main objective which was the application of artificial intelligence on ambulance transportation network for health care systems on ambulances as solution to health care sustainability. The study evaluate application of the idea of artificial intelligence transportation network company like uber-Style on ambulances to move patients to the nearby health care facilities during emergency preventing serious cases like death. Survey data collection method was adopted utilizing both qualitative and quantitative data collection in getting opinions and answers to the main objective, the area of study was the remote areas of Kakamega town; Majengo and Makaburini remote areas in kakamega, kakamega county of western Kenya, study defines research goal which is an application of AI on ambulances transportation network to promote healthcare services, it designed questionnaire, selected a sample size, administer the survey, collect and analyze data then offer conclusion.

Key words: Artificial intelligence, Ambulance transportation network, Heath care systems.

Refugee Youth Access to Higher Education in Kenya: Mapping of The Literature and Synthesis of The Evidence

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Abstract

Higher education is the gateway to economic self-reliance for many youths from vulnerable backgrounds. Refugees are a segment of society that is not only vulnerable but also excluded largely from mainstream development activities in host countries such as Kenya. Thus, for the refugee youth, access to higher education is the only sustainable rehabilitation and empowerment that can guarantee a bright future. Initially access to higher education was not recognized as a basic right for youth in disadvantaged environments. However, the Sustainable Development Goals do consider access to education from basic and higher levels a fundamental right for every child and youth. Despite this recognition, many youths do not enjoy universal access to higher education. While there is much on provision of humanitarian aid namely; food, shelter and clothing, there is less focus on higher education as it is considered a secondary priority. This has excluded over one hundred thousand eligible youth refugees from accessing higher education. Studies on refugees have always centered on provision of humanitarian aid, repatriation, resettlement and security while neglecting access to higher education. The overall research question is how can the refugee youth access to higher education be enhanced particularly, in the context of refugee youth in Kenya? This research is informed by the human rights-based approach (HRBA). It brings together the evidence on the refugee youth access to higher education and interrogates common themes, practices and policies on refugee youth higher education and associated reforms to tackle marginalization of refugee youth. It analyses the evidence on government policies, financial support, and social support. Ten peer-reviewed articles mostly from Kenya published between 2018 and 2025 will be selected and analysed into four organisational levels: government, university, pre-university education, and student. In addition, relevant grey literature on refugee youth higher education will also be analysed. This research will not only offer insights into specific factors that support or hinder refugee youth access to higher education, but it will also strengthen the voice of refugee youth in championing relevant policy and legal frameworks, and pedagogical approaches in higher education.

Akiliunde (Ai) na Ufunzaji Katika Karne Ya 21: Mfumo wa CBE Nchini Kenya

Dkt Florence M. Anyonje - Kitivo cha Sanaa na Maswala ya Sayansi Jamii Chuo cha Bomet

IKISIRI

Mbinu za ufunzaji katika karne ya 21 zinamlenga mwanafunzi zaidi kuliko awali ambapo mwalimu ndiye pekee aliyekuwa na ujuzi na maarifa. Teknolojia za kisasa zinatumiwa kufunza kwa sababu kila uchao kuna uvumbuzi mpya unaorahisisha utendakazi katika sekta tofauti ikiwemo elimu. Mwanafunzi wa kisasa ana ujuzi wa kutumia teknolojia kupata maarifa, kutafiti, kuvumbua na kujiamulia mambo hata namna anavyotaka kusoma. Utafiti huu unalenga kutathmini matumizi ya teknolojia ya Akiliunde (AI) katika kufundisha kwenye mfumo wa CBE nchini Kenya. Teknolojia ya Akiliunde imeathiri kwa kiasi kikubwa utendakazi hata mle darasani. Kwa kurejelea tafiti ambazo zimefanywa utafiti huu unahakiki namna AI imetumiwa kufunza ikichukuliwa kuwa tayari mfumo wa CBE umeshika kasi nchini Kenya. Mfumo wa CBE unasisitiza nafasi ya mwanafunzi katika ujifunzaji. Anapotagusana na teknolojia za kisasa kama AI mwanafunzi anapata nafasi ya kutafiti, kujifunza, kupata maarifa na umilisi ambao unamsaidia kukidhi mahitaji yake tofauti. Kwa kurejelea majarida ya mtandaoni, machapisho, mawasilisho katika makongamano, ripoti na sera za elimu nchini Kenya ni wazi kuwa AI inatumiwa katika mchakato wa kufunza. Kuna programu ambazo walimu pamoja na wanafunzi wanatumia kama vile; ChatGPT, app za kuchanganua data, kuandaa mafunzo kama maazimio ya kazi, maandalizi ya vipindi, kuandaa tathmini n ahata kumtolea mwanafunzi mwelekeo kuhusu ujifunzaji wake. Wanafunzi wana ruhusa ya kutafiti kwenye mtandao dhana, hoja, ufafanuzi na kushiriki ujifunzaji na wenzao kwenye sehemu tofauti. Kuna picha na video za walimu wa mtandaoni ambazo darasa au mwanafunzi anaweza kuzitumia binafsi. Utafiti huu unanua kutoa mwelekeo wa matumizi ya AI katika mchakato wa kufunza ili mbinu za ufunzaji zikidhi mahitaji ya karne ya 21.

Istilahi muhimu: 1. Akiliunde Teknolojia

INTEGRATION OF AI IN INCLUSIVE EDUCATION: A SYSTEMATIC REVIEW

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ABSTRACT

In recent years, technological advances have played a very important role in our society, as well as in different educational contexts, including Education for Sustainable Development. Artificial intelligence (AI) and new technologies are having a pervasive impact on modern societies and communities. AI technologies, such as adaptive learning systems, natural language processing, and AI-driven assessment tools, offer substantial benefits by personalizing learning experiences and addressing individual needs. However, challenges such as accessibility, ethical challenges and teacher training need to be addressed to ensure the equitable and effective implementation of AI in inclusive education. This review explores the research trends of AI integration in education, application and challenges. PRISMA guidelines were used to source for articles from different databases. The findings revealed an increase in research in AI in inclusive education from 2019 to 2023. The application areas include Personalised Learning Tools such as text-to-speech, Adaptive Learning Platforms such as Knewton's adaptive learning technology and Assistive Technologies such as Texthelp Read & Write. This study underscores the necessity for policies and strategies that ensure the ethical and sustainable utilization of AI in inclusive environments.

Key words: Artificial Intelligence; Higher Education; Chatbots; Inclusive *Education*

Benefits and Challenges of AI Chatbots Application in Higher Education.

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Abstract

The integration of Artificial Intelligence (AI) has led to the growing adoption of Chatbot systems within the education sector, particularly in Higher Education (HE). These AI-powered tools are increasingly utilized to enhance learning experiences and streamline administrative services. Chatbots offer the potential for fast, personalized interactions that benefit both students and institutional staff. This paper explores the benefits and challenges associated with implementing AI Chatbots in higher education. It provides a thorough review of existing literature, highlighting previous research, advantages, and obstacles encountered during the deployment of Chatbot technologies in academic environments.

Key Words: *Artificial Intelligence, Chatbots, Higher Education, Benefits, Challenges.*

An investigation of the Future of Artificial intelligence as a Transformative Technology: Unlocking the opportunities for Sustainable Development

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Abstract

Artificial Intelligence (AI) is rapidly evolving from a disruptive tool into a transformative technology, poised to fundamentally reshape global systems and drive progress toward the United Nations Sustainable Development Goals (SDGs). This qualitative study investigated the future trajectory of AI, specifically examining its potential to unlock opportunities for sustainable development. Through a systematic document review of academic literature, industry white papers, and major policy frameworks from the past three years, this research analyzed the practical applications and projected pathways of AI development. The study was guided by four objectives: (1) to identify and categorize the most significant AI-driven innovations impacting environmental sustainability, social equity, and economic inclusion; (2) to analyze the evolving discourse on ethical AI governance and its critical role in ensuring equitable outcomes; (3) to assess the emerging skills gap and the future of work in an AI augmented economy; and (4) to delineate the primary barriers—technological, regulatory, and infrastructural—to the widespread adoption of AI for sustainable purposes. The findings indicated that while AI presented unparalleled opportunities in areas like climate modeling, precision agriculture, and personalized education, its benefits were not automatic. The future was found to hinge on the development of robust, inclusive governance models that prioritized transparency, equity, and global cooperation. This study concluded that strategically steering AI development was imperative to harness its transformative potential as a foundational technology for a sustainable and equitable future.

The Role of Artificial Intelligence in Teachers' Emotional Intelligence and Job Performance in Kenya

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Abstract

Teachers' emotional intelligence (EI) has become a global concern as it plays a fundamental role in the teaching and learning process and directly influences job performance. However, many teachers face challenges such as burnout, anxiety, and declining mental health, which undermine their well-being and professional effectiveness. This review synthesizes empirical evidence on how EI competencies, supported by Artificial Intelligence (AI)-driven tools, enhance teacher performance in contemporary classrooms. The study explores the potential of integrating AI into teachers' EI assessment, monitoring, and training. Emerging AI technologies that include chatbots, gamification, and wearable device are identified as transformative pathways for developing fundamental EI components: self-awareness, empathy, self-regulation, and motivation. A contemporary systematic review was conducted using PRISMA guidelines, drawing on peer-reviewed studies published between 2015 -2025 from Scopus, Web of Science, and ERIC. Forty-two studies met the inclusion criteria. Findings indicate that AI technologies provide anonymous, empathetic, and accessible support systems that enable real-time monitoring of teachers' emotional states. These tools foster stigma-free interventions that enhance job productivity and well-being. The study proposes a conceptual framework for embedding AI into teacher wellness programs and highlights ethical considerations regarding privacy, trust, and contextual adaptation. Practical insights are offered for the Ministry of Education and technology developers to operationalize AI within teacher performance appraisal systems (TPAD). Overall, the integration of EI and AI presents a proactive approach to strengthening teacher resilience, emotional well-being, and professional performance in Kenya.

Keywords: Emotional Intelligence, Artificial Intelligence, Teacher Performance, TPAD, Kenya

Household Characteristics, Financial Behavior, and Food Insecurity in Kenya: Evidence from the 2024 FinAccess Survey

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Abstract

Food security continues to be a significant concern in Kenya, as numerous households are compelled to decrease meal consumption. The relationship among household characteristics, financial behavior, and food security outcomes is inadequately comprehended, hindering focused actions to enhance nutritional and economic welfare. This study investigated the effect of household characteristics and financial practices; savings and expenditure plan, on food security in Kenya. Grounded in Household Production Model and Capability Approach, this study employed a quantitative methodology utilizing secondary data from FinAccess Household Survey. Statistical Package for Social Sciences was used to analyze data applying descriptive statistics and inferential statistics: correlation and regression analysis. Study results revealed that residence households tended to be larger ($r = -0.162$, $p < 0.001$) and had more children ($r = -0.195$, $p < 0.001$). Expenditure decision-making was highly centralized, with major and daily expense decision-makers strongly correlated ($r = 0.891$, $p < 0.001$). Saving behavior correlated positively with structured spending plans ($r = 0.312$, $p < 0.001$) and weakly negatively with food insecurity ($r = -0.024$, $p < 0.001$), highlighting the role of financial discipline in mitigating vulnerability. Regression results showed that household attributes and financial practices jointly influenced food insecurity ($R^2 = 0.014$, $p < 0.001$). Saving behavior had the strongest negative effect ($\beta = -0.122$, $p < 0.001$), while urban residence increased food insecurity ($\beta = 0.059$, $p = 0.001$). Household size and number of children exhibited negative effects, suggesting adaptive strategies such as income pooling and labor sharing. Decision-making roles were not significant predictors, emphasizing that effective resource management outweighs who controls expenditures. This study concludes that saving and budgeting significantly enhance household food security in Kenya. It recommends promoting financial literacy, inclusive decision-making, and accessible savings mechanisms to strengthen resilience.

Keywords: Household, Characteristics, Financial Behavior, Savings, Expenditure Planning, Decision Making, Food Security

Coping Strategies and Food Insecurity Among Marachi Smallholder Farmers in Butula Sub-County **Gladys Nangila Hopillo¹, Dr. Precious Joan Wapukha ² & Prof Charity Iruma Irungu³**

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Abstract

Food insecurity persistently affects rural communities worldwide, with smallholder farmers in Africa especially susceptible to unpredictable rainfall, inadequate agricultural resources, and economic disruptions hence the need for coping strategies. The efficacy of coping strategies to alleviate food insecurity is frequently influenced by household socioeconomic status. This study sought to determine the mediating role of socioeconomic status in the relationship between coping strategies and food insecurity among the Marachi Community smallholder farmers from Butula Subcounty, Busia County. This study was anchored on Symbolic Interaction Theory and the Capability Approach. This study used mixed methods approach collecting data using questionnaire, key informant interviews and focus group discussions. Quantitative data was analyzed using Statistical Package for Social Sciences using both descriptive and inferential statistics. While, qualitative data was analyzed thematically. Study results revealed a significant positive correlation between coping strategies and food insecurity among Marachi smallholder farmers in Butula Sub-County ($r = 0.972$, $p < 0.01$). Regression analysis results indicated that coping techniques was a strong predictor of food insecurity ($R^2 = 0.945$, $B = 1.389$, $p < 0.001$). Similarly, qualitative study results revealed that coping strategies including meal reduction, prioritization of children's needs, pursuit of supplementary income, borrowing, and consumption of inferior food effectively addressed urgent food shortages but were inadequate in substantially alleviating overall food insecurity. Thus the conclusion that that households coping strategies significantly influence food insecurity among Marachi smallholder farmers. Resultantly, this study recommended that policymakers should prioritize training in crop diversification, affordable finance facilitation, and strengthening community support structures to improve the efficacy of coping techniques and mitigate the long-term effects of food insecurity.

Keywords: Coping Strategies, Smallholder Farmers, Food Insecurity, Marachi Community

AI Companions and Psychological Risks of Overdependence among University Students

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Abstract

In Kenya qualifying to join a university is a significant milestone for the youth. It is a major social status transformation. University life is characterized by transitions, identity exploration and social integration. In the African context, many students complete their primary and high school education while still in close contact and support from family members or at least close supervision from a senior member of the society. However, at the university level many students, especially those studying away from their families may experience social difficulties and loneliness resulting in a pervasive challenge. In recent years, AI companions ranging from mental health chatbots to social interaction platforms have gained traction as accessible tools for support. While these technologies offer immediate comfort, their long-term implications raise questions about human-AI relational dynamics, particularly regarding overdependence and psychological well-being. This reflection paper examines the psychological risks of overreliance on AI companions among university students. It explores how AI-mediated relationships affect emotional resilience, interpersonal skills and social integration and considers how university students can responsibly engage with these technologies.

Key Words: AI, AI Companions, Psychological Risks, Overdependence

Influence of artificial intelligence on key entities in the education system as perceived by university students

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Abstract

Evolution of Information and Communication Technology (ICT) has culminated in artificial intelligence (AI), which is pervading many sectors of life. The permeation of AI into the education sector has led to mixed feelings about how it is likely to impact on education of children. The purpose of this study was to explore how AI is influencing the education system as perceived by university students in Kenya. The objectives were to explore how AI is influencing schools and classrooms as well as learning and teaching processes. The study was guided by systems theory as initiated by Ludwig von Bertalanffy in the year 1925. Research design was exploratory sequential within the mixed methods approach. Research population was 5647 individuals. Sample size was 139 individuals. Sampling was by simple random sampling and purposive sampling. Data collection instruments were questionnaire, interview schedule and focus group discussion guide. Reliability of the questionnaire was ascertained by Cronbach's alpha and the reliability coefficient was 0.83. Qualitative data was analysed thematically while quantitative data was analysed by descriptive statistics. The results indicate that AI has reduced school and class attendance since learners have an alternative in AI. Furthermore, although AI can increase the efficiency of learning, learners over rely on it, hence impacting negatively on their memory and this could be the reason why AI is highly associated with unethical behavior such as cheating in exams and assignments. Moreover, AI will make teaching more efficient and effective since it can help teachers to accomplish some tasks that would have otherwise been tedious and time consuming. However, the reliance on the teacher will reduce since the learner can consult AI for answers to questions. This study recommends that learners should be taught how to use AI responsibly so as to develop survival skills. Teachers should also device authentic evaluation strategies whose results truly reflect the ability of the learners. Policies should be devised on how to integrate AI within the education system so as to produce men and women who have relevant skills to survive in the current AI driven society.

Key Words: Artificial intelligence, education system, key entities, perceive, university students

Readiness of higher institutions of learning in Kenya for the adoption and utilization of Artificial Intelligence: A Literature Review

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Abstract

With the introduction of Artificial Intelligence (AI) in all sectors of the economy in the world, higher institutions of learning face a fundamental shift in their operations. These institutions have no option but to adjust and remain relevant by joining the world in the irreversible technological bandwagon of change using AI to support in the efficient management of their affairs. This study reviewed relevant journals to establish the level of readiness of higher learning institutions for the adoption and utilization of AI in their day to day operations. The following research questions guided the review: What skill set do instructors and students require for effective use of AI for education purposes? Are there adequate institutional resources to support the adoption and utilization of AI? Which institutional policies are in place to guide the utilization of AI? The study adopted Preferred Reporting Items for Review and Meta Analysis (PRISMA) the 68 articles reviewed resulted into a sample size of 23 refereed journals that accurately captured the issues under study. Google scholar search engine using appropriate research questions on the area of study was used to generate the 68 articles that were reviewed. The findings were organized into three main themes that formed the research questions of the study. The major findings of the study showed that some elements of AI were being utilized in all institutions of higher learning that were studied and indeed AI improved the efficiency of work in those institutions, however, there were no evidence of capacity building among the staff and students on the utilization of AI. The study noted that higher institutions of learning were equipped with necessary information systems but lacked the necessary AI integration applications. The reviewed literature acknowledged the need for a robust AI infrastructure and AI policy to streamline the utilization of AI within institutions of higher learning. The study showed the availability of appropriate Communication, Information and Technology (ICT) infrastructure which were not integrated with the right AI application software did not support AI adoption and utilization. The findings revealed that some higher learning institutions had developed AI policies but failed to operationalize them fully. It was concluded that the level of AI adoption and utilization was still low and higher institutions of learning needed to invest in capacity building to improve efficiency and promote the development of core competencies among the staff and students.

Keywords: Artificial Intelligence, Higher institutions of learning, policy, Capacity, Infrastructure, Software

The Rising Interest in AI and Education: Opportunities and Risks to Future Teaching and Learning

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Abstract

Artificial intelligence (AI) is racing fast, providing opportunities to expand capabilities to augment human intelligence. The rapid advancement of Artificial Intelligence (AI) is transforming various sectors and education is no exception. AI is playing a significant role in both general and higher education, by influencing academic development by offering opportunities and challenges. Since the adoption of Competence Based Education (CBE) in the Kenyan Schools. AI is challenging the traditional approaches to teaching and learning. In this review paper the AI systems available and tools for quality learning will be discussed. The AI systems that educators can use for instructing will be presented. AI presents both exciting opportunities and substantial risks that demand careful consideration. AI will introduce new responsibilities for the instructors to be able to guide the learners in the ethical and responsible use of technology. Unfortunately, AI may not be able to inspire curiosity and shape values, discipline and social skills which are crucial components of CBE. The future educator will use AI platforms to carry out assessments which should be able to flag learners who have challenges to allow for timely interventions. This approach is proactive and has emphasis on mastery of competencies. However, AI holds immense potential to reshape the future of education by offering personalized learning experiences. Careful attention to ethical considerations, data privacy and balancing technology with human interaction is paramount to realize the full benefits of AI in education and ensure a positive and equitable learning environment for all. A balanced approach is essential to ensure equitable, effective and responsible learning experiences in AI-enhanced educational environments.

Key words: artificial intelligence in education; competency based education; ethical considerations; personalized learning; teaching and learning

Ethical Dilemmas and Supervisory Challenges in the Use of Generative Artificial Intelligence in Postgraduate Research: A Qualitative Study of Kenyan Universities

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Abstract

The use of generative artificial intelligence (AI) tools is increasingly common in postgraduate research, offering benefits such as improved writing support and idea generation. However, in Kenyan universities, this trend presents significant ethical and supervisory challenges because of a lack of clear policies and guidance on the use of technology tools in writing. This matter is further complicated by the fact that Universities have their own way of regulating research. This qualitative study examines how postgraduate students use AI tools and explores the implications for academic integrity, supervision, and institutional policy. Data was collected through interviews, focus group discussions, and document analysis across three universities. Findings reveal frequent AI use among students, limited awareness of ethical boundaries, and a lack of clear institutional guidelines. Supervisors reported difficulty detecting AI-generated content and expressed concern over their evolving roles, for which they are largely unprepared. The study concludes that without proper policies and training, AI use may undermine research quality. Recommendations include the development of university-wide AI guidelines, supervisor and student training programs, and investment in AI detection tools. This research contributes to policy discourse on ethical AI integration in higher education.

Key Words: Generative Artificial Intelligence, Postgraduate Research, Academic Integrity, Supervisory Challenges

Integrating AI in school management and its effect on core competencies attainment among learners in junior schools in Bomet county, Kenya.

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Abstract

The integration of Artificial Intelligence (AI) into school management has the potential to strengthen the Competency-Based Curriculum (CBC) by improving decision-making, resource allocation, teacher development, curriculum delivery, and school climate. However, in Bomet County, limited AI adoption and low digital readiness threaten competency attainment. The Ministry of Education (2024) reports that only 35% of junior schools have functional digital labs, over 60% lack reliable internet, and fewer than 30% of teachers feel confident using digital tools. Broader national indicators also show weak ICT capacity, with limited county-level connectivity initiatives. These constraints expose systemic barriers to AI-driven school management. This study examines the effect of integrating AI in school management on learners' core competencies in Bomet junior schools. It focuses on four areas: AI in resource allocation, curriculum management, teacher professional development, and school climate. Anchored in the Technology Acceptance Model (TAM) and Systems Theory (ST), and adopting a pragmatist paradigm, the study uses a convergent-parallel mixed-methods design. The target population includes 479 head teachers, 1,389 teachers, 5 Sub-County Directors of Education (SCDEs), and 48,311 learners. A sample of 329 respondents is derived using Yamane's formula, with SCDEs included by saturation and learners purposively selected for focus groups. Data will be gathered through questionnaires, interviews, focus groups, and document reviews. Validity will be ensured through expert review and triangulation, while reliability will be tested using the Intraclass Correlation Coefficient (ICC). Quantitative data will be analysed in SPSS (descriptive and inferential statistics, including regression at $\alpha=.05$), and qualitative data thematically in NVivo. The study is expected to reveal systemic and operational barriers to AI adoption while highlighting opportunities where AI can enhance critical thinking, problem-solving, and digital literacy. Findings will provide evidence-based recommendations for head teachers, county officials, and policymakers to guide sustainable AI integration in CBC implementation.

Artificial Intelligence in Finance and Trade: Implications for Airline Sales Strategies and Route Performance in Eldoret City, Kenya

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Abstract

Artificial intelligence (AI) is reshaping global finance and international trade by driving innovations in credit scoring, algorithmic trading, fraud detection, hedging, and supply chain optimization. These capabilities are increasingly relevant to the aviation sector, where commercial performance depends on precise forecasting, risk management, and agile pricing strategies. This paper investigates the intersection between AI adoption in finance and trade and its impact on airline performance, focusing on carriers serving Eldoret International Airport (EDL), a critical economic hub in Kenya's Rift Valley region. Methodologically, the study employs a systematic literature review of peer-reviewed sources, industry reports, and case studies, combined with secondary market data from airline schedules, online travel agencies, and public financial disclosures. The analysis highlights how AI-enabled treasury tools lower currency-hedging costs, AI-driven dynamic pricing improves yield management, and digital payment integration enhances conversion rates in markets dominated by mobile money. The paper further identifies risks, including model opacity, vendor dependency, and regulatory fragmentation, and recommends robust explainability frameworks, local payment acceptance (e.g., M-Pesa), SME-oriented credit underwriting using AI, and integration of predictive analytics for demand forecasting. The findings suggest that combining AI-enabled financial solutions with targeted sales strategies can improve load factors, yields, and ancillary revenues, thereby strengthening air connectivity and trade facilitation in regional markets such as Eldoret. The paper concludes with policy recommendations for regulators and actionable strategies for airline managers to responsibly leverage AI for sustained route profitability.

Keywords: Artificial intelligence, finance, trade, airline sales strategy, Eldoret International Airport, dynamic pricing, revenue management, FX hedging, mobile payments, SME credit scoring

The Impact of Artificial Intelligence on Teacher Education in Kenyan Universities: A Critical Review

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Abstract

This review paper has examined the transformative role of artificial intelligence (AI) in training programmes for teacher education within universities in Kenya. Artificial intelligence in education has advanced globally. Despite this advancement, there exists research gaps with regards to AI implementation and even its effectiveness in teacher education programmes in Kenya. The purpose of this review is to analyze the status of AI integration in teacher education in Kenyan universities, identify AI integration implementation challenges, and suggest way forward. Systematic literature analysis of peer-reviewed publications from 2018 to 2025 was adopted. Findings revealed limited though growing AI integration in teacher education programmes in Kenyan Universities. Further revealed that there was potential for AI integration to enhance pedagogical practices. This critical review contributes insights valuable for University management in developing AI-enhanced teacher education programmes.

Ai-Integrated with Digital Holographic Microscopy for Real- Time Monitoring of Antibiotic Susceptibility.

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Abstract

Advances in artificial intelligence (AI) and medical imaging have made digital holographic microscopy (DHM) an important tool for extracting detailed medical information. However, conventional imaging methods struggle to interpret the complex data produced by DHM. This work explores the integration of AI with DHM for bacteria culturing and image analysis to improve diagnostic accuracy and treatment decisions. Collected DHM data are processed through image analysis and AI to classify colonies and determine measurable thresholds. DHM images are continuously analyzed until measurable changes occur, which are then detected, quantified, and reported. Specifically, AI algorithms automatically extract, quantify, and track in real time the morphological and optical changes in *E. coli* bacteria—such as variations in cell size, shape, elongation, refractive index, and growth dynamics—that indicate antibiotic susceptibility. Knowledge of *E. coli* colony development and related microbial diseases supports temporal and spatial identification of infections. Combined with predictive medical models, this provides clinicians with a powerful decision-making tool for managing *E. coli*- related diseases. Findings demonstrate that AI-integrated DHM, based on optical sensors, enhances the accuracy, speed, and information content of bacterial growth analysis. Compared with conventional imaging, this method delivers richer data and more reliable diagnostic predictions.

Keywords: Optical sensor, Artificial intelligence, Digital holographic microscopy technology, accuracy and application.

Artificial Intelligence-Driven Analysis of Environmental, Social, and Governance (Esg) Disclosures And Financial Sustainability of Listed Firms In Kenya

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Abstract:

The intersection of Environmental, Social, and Governance (ESG) practices with financial sustainability has become a focal point of corporate accountability, particularly in emerging markets such as Kenya. This study explores how ESG disclosures influence the financial sustainability of firms listed on the Nairobi Securities Exchange (NSE), while incorporating Artificial Intelligence (AI) to enhance the measurement and analysis of disclosure quality. Using natural language processing (NLP) and machine learning algorithms, ESG disclosure scores were constructed from annual reports, sustainability statements, and regulatory filings between 2015 and 2024. AI-enabled content analysis allowed for deeper insights into disclosure tone, consistency, and materiality beyond traditional manual scoring. Financial sustainability was assessed using multi-dimensional indicators, including profitability persistence, cash-flow adequacy, and solvency ratios. The study was guided by stewardship, stakeholder, and institutional theories. The study relied on secondary data of 51 listed firms in the Nairobi Securities Exchange which was obtained through thematic content analysis. Descriptive statistics and Panel data econometric techniques were employed, supplemented with predictive AI models to test the robustness of associations. The findings reveal a positive relationship between ESG disclosure quality and financial sustainability, with governance and social dimensions exerting stronger predictive effects than environmental disclosure. AI-based models demonstrated higher accuracy in predicting firm-level financial resilience compared to conventional approaches. Furthermore, sectoral variations suggest that resource-intensive firms benefit most from transparent environmental reporting, while service-oriented firms gain from strong social and governance disclosures. The study demonstrates that AI can significantly enrich ESG research by improving disclosure measurement, enhancing predictive power, and providing actionable insights for investors, regulators, and managers. For Kenyan listed firms, adopting AI-supported ESG reporting frameworks not only strengthens compliance and stakeholder trust but also contributes to long-term financial sustainability. The paper calls for integrating AI tools into sustainability reporting standards and for further exploration of how technology can bridge the ESG-finance nexus in emerging economies Keywords: Artificial Intelligence, ESG Disclosures, Sustainability Reporting, Financial Sustainability.

Application of Artificial Intelligence in Primary and Junior Secondary School to Support Students' Mental Health and Well-Being in Kisii County, Kenya.

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Abstract

The connection between education and artificial intelligence (AI) seems to point towards the potential to change traditional learning and support platforms. This investigation is based on the awareness and implications of AI technology in primary and junior secondary school education as a tool to develop student mental health and well-being. The purpose of the study was to explore the use of artificial intelligence in primary and junior secondary school education as a means of supporting student mental health and well-being amongst schools in Kisii County, Kenya. A descriptive case study research design using a quantitative research approach, including surveys and interviews was used to explore the impact of AI in addressing mental health amongst primary and junior secondary education students. The study used purposeful sampling approaches to identify and gather a sample 605 participants that experienced challenges with mental health. The study revealed substantial mental health difficulties for students in Kisii County, with 37% of students exhibiting indicators of depressive symptoms, anxiety (30.7%) and stress (20.7%), however only 11.6% of students had no mental health issues. Logistic regression analysis showed that the perceived effectiveness of the AI interventions was a significant factor in whether students exhibited any positive mental health. It appeared that older students rated the interventions more favorably, although the procedures by which individuals were aware of and familiar with AI at the start of interventions, varied among participants. The study recommends effectively implement AI-powered mental health interventions for students, it is important to promote awareness and education, adapt tools to age and gender, integrate AI in curricula, develop extensive support networks, monitor and evaluate their effectiveness, and engage stakeholders in partnership.

Keywords: Artificial intelligence (AI), mental health, well-being, education, technology

Faith in the Age of Artificial Intelligence: Cultural and Religious Implications for African Societies

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Abstract

The intersection of Artificial Intelligence (AI) and religion presents new opportunities and challenges for African societies. From AI-assisted preaching and digital scripture interpretation to ethical debates about human-machine interactions in spirituality, faith communities are increasingly confronted with the cultural implications of technological advancement. This paper explores the impact of AI on Christianity, Islam, and African Traditional Religions (ATR) within the African context. Using a qualitative methodology, the study reviews current academic sources, case studies, and theological perspectives on technology. Key issues identified include questions of spiritual authenticity, authority of AI-mediated religious practices, ethical dilemmas of data use in faith-based institutions, and the risk of eroding sacred traditions. The discussion highlights both harmonies and tensions, showing that while AI can enhance access to religious resources and foster intercultural dialogue, it also threatens to commodify spirituality. Findings suggest that theological reflections rooted in African cultural values are essential for guiding responsible integration of AI in religious spaces. The paper concludes by recommending dialogue between technologists, theologians, and cultural leaders to ensure that AI complements rather than displaces faith traditions.

Keywords: Artificial Intelligence, Religion, African Traditional Religions, Christianity, Islam, Cultural Practices, Ethics.

The Relevance of Artificial Intelligence in Societal Transformation and Inclusion: A Historical Purview

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Abstract

Artificial intelligence (AI) has enabled transformative possibilities in numerous aspects of human life and social interactions. The pace of use and adoption of AI has gained momentum more so in the contemporary era of rapid technological advancement. AI and its tools have been gradually developing and getting better with the passage of time. This therefore, necessitates a historical examination to understand its developments, successes and challenges, which are significant for social inclusion. Critiques, have however, emerged on the adoption of AI since its inception in the Graeco-Roman Era to the contemporary times. These shortcomings have been attributed to algorithmic biases, privacy concerns, accountability issues as well as implications for equity and inclusion. AI is a general-purpose tool and is endeavoured to transform numerous socio-economic, politico-economic and socio-political aspects of human engagements. They include, but not limited to criminal justice, education, finance, health, science, governance, security as well as transport and communication systems. AI is therefore, envisioned to enhance efficiency in decision-making processes, critical thinking in instances of conflicts among various groups of humanity, subsequently, save costs and foster better resource allocation and utilization. By historically examining the development of AI, unique insights into human behaviour, social revolution as well as more ethical reasoning and decision-making are made. This enhances the drawing of parallels between past and present and foresee potential future challenges by formulating reasoned decisions, which are significant for inclusive human interactions. The methodology adopted for this study is historical, which examines past relationships of technology and society, significant to foster critical skills to challenges and complexities of AI. Hence, through the examination of historical precedents, assumptions are assessed and information is critically evaluated for its ethical implications in society. Additionally, experimentation, surveys as well as mixed methods to automate tasks, find patterns and derive insights will be adopted for this study. AI system analysis will also be used to understand the limits and capabilities of this tool. Hence, computational ethnography and multi-modal research, which leverages on AI to analyse complex digital behaviours and integrate diverse data types will be handy.

Key words: artificial intelligence, ethical considerations, history, humanity, social inclusion, Technological advancements, tools

Leveraging Artificial Intelligence in Management Planning and its Influence on Quality of Education in Junior Schools in Bomet County, Kenya

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Abstract

The integration of Artificial Intelligence (AI) into education management is increasingly recognized as a transformative approach for enhancing accountability, efficiency, and quality in schools. In Kenya, the implementation of Competency-Based Education (CBE) has redefined the structure of basic education through the establishment of Junior Secondary Schools (JSS), substantially expanding the managerial responsibilities of headteachers. Despite government investments in ICT infrastructure and in-service training, challenges persist in management planning, which threatens the realization of equitable and quality education. This study seeks to examine how leveraging AI in school management planning influences the quality of education in junior secondary schools within Bomet County. The study will be anchored in **Artificial Intelligence Theory**, which highlights the role of machine intelligence in augmenting human decision-making and efficiency, and **Systems Theory**, which views schools as interdependent systems where changes in management practices influence overall performance, the study positions AI as a catalyst for strengthening school leadership and institutional effectiveness. The research is guided by the pragmatism paradigm and employs a concurrent triangulation design, specifically the convergence model (Guetterman et al., 2019), to integrate both quantitative and qualitative insights. The study's objective will be to find out the influence of leveraging AI in management planning on the quality of education. The target population will comprise 541 headteachers, 541 Board of Management (BoM) chairpersons, 541 Parents' Association (PA) representatives, class teachers of Grades Seven, Eight, and Nine, class secretaries, and five sub-county directors of education in Bomet County. Using Yamane's formula, a sample of 321 respondents—including 107 headteachers, 107 BoM chairs, and 107 PA representatives—will be selected, while all sub-county directors will be included through saturation sampling. Data will be collected through questionnaires, interviews, focus groups with learners, and document analysis. Reliability of quantitative instruments will be tested using Cronbach's alpha, while qualitative credibility will be established through member checking, audit trails, and triangulation. Quantitative data will be analyzed using SPSS version 30 through multiple regression and chi-square tests, while qualitative responses will be coded and analyzed thematically with NVivo software. The findings are expected to provide empirical insights into the effectiveness of AI-enhanced management planning practices, highlight the mediating challenges of infrastructure, digital literacy, and policy support, and generate recommendations for policy reforms and capacity-building initiatives. Ultimately, this study will contribute to strengthening school leadership and promoting quality education in alignment with Kenya's ICT in Education Policy and Sustainable Development Goal 4, which advocates for inclusive and equitable quality education.

The Influence of Artificial Intelligence on MSMEs and Startups: A Systematic Review with Lessons for Sub-Saharan Africa

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Abstract

Nascent entrepreneurs operate in environments characterized by high uncertainty, resource scarcity, and fragile ecosystems. Artificial intelligence (AI) is increasingly positioned as a transformative enabler, with the potential to enhance opportunity recognition, reduce costs, accelerate product development, and expand market reach. Yet, for Sub-Saharan Africa (SSA), and Kenya in particular, structural constraints such as limited financing, high informality, and mobile-first digital infrastructures create unique adoption pathways that remain underexplored.

This systematic review aims to synthesize global evidence on the influence of AI in early-stage entrepreneurship and to derive context-specific lessons for MSMEs and start-ups in SSA.

The review will systematically search peer-reviewed and grey literature across databases including Scopus, Web of Science, IEEE Xplore, ABI/INFORM, and regional sources (e.g., AfDB, national digital economy reports). Eligible studies will include entrepreneurs at early stages (≤ 3 years) using AI modalities such as machine learning, natural language processing, generative AI, predictive analytics, and computer vision. Screening and quality appraisal will follow PRISMA guidelines. Data extraction will capture AI applications, mechanisms, outcomes, risks, and their relevance to SSA. Synthesis will combine narrative, thematic, and, where feasible, meta-analytic approaches to generate a logic model of AI's influence.

The review will (1) map how AI affects entrepreneurial processes and outcomes globally, (2) highlight risks and ethical challenges, and (3) distill lessons for SSA entrepreneurs. Anticipated insights include AI as a resource multiplier under capital and talent constraints, leveraging mobile-first ecosystems to leapfrog, AI's role in addressing fragmented markets, and the importance of capacity-building in digital literacy.

By bridging global insights with SSA realities, this review will inform scholars, policymakers, and practitioners on how AI can enhance resilience, innovation, and growth for early and nascent entrepreneurs in resource-constrained ecosystems.

Harnessing Artificial Intelligence for Climate-Smart Environmental Monitoring and Agricultural Decision Support in Kenya's Highlands

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Abstract

Agricultural productivity and ecosystem stability in Kericho and Bomet counties in Kenya are increasingly threatened by climate variability, deforestation, soil erosion, and unsustainable land-use practices. These challenges undermine agriculture-based livelihoods and water catchment integrity, yet conventional monitoring and forecasting systems often lack the spatial precision and timeliness required for proactive decision-making. Emerging applications of Artificial Intelligence (AI) offer a transformative opportunity to strengthen climate resilience and sustainable development planning in these highland ecosystems. This study integrates two complementary AI-driven approaches. First, building on insights from a case study on the Four Corners Fire in Cascade, Idaho, high-resolution PlanetScope imagery was analysed using Support Vector Machine (SVM) classification to quantify changes in canopy cover and surface vegetation. While the original study focused on post-fire impacts, the same method can be adapted locally to monitor deforestation, detect vegetation degradation, and assess the effectiveness of soil and water conservation measures in Kericho and Bomet. Second, the study proposes the use of deep learning models such as Long Short-Term Memory (LSTM) neural networks, trained on multi-year meteorological data, satellite rainfall indices, and real-time Internet of Things (IoT) sensor feeds, to generate localized short-term and seasonal rainfall forecasts. These forecasts could guide farmer decisions on planting, irrigation, and fertilizer use, while informing county-level early warning systems and climate-smart infrastructure planning.

By combining land cover monitoring with localized rainfall prediction, this AI-enabled framework can support data-driven environmental governance, enhance agricultural productivity, and build climate resilience in Kenya's highlands. I acknowledge the contributions of Justin Fairbanks and Austin Wall as co-researchers in the original Four Corners Fire study from which part of these methodological insights were derived.

The Influence of AI on Higher Education in Kenya: A Study on Student Adoption, Drivers and Challenges

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Abstract

This paper reviews existing literature on the adoption, key drivers and challenges of Artificial Intelligence (AI) by students in Kenyan higher education institutions. The study was anchored on the Unified Theory of Acceptance and Use of Technology (UTAUT), which posits that performance expectancy, effort expectancy, social influence and facilitating conditions predict technology adoption. A scoping review was carried out following the PRISMA-ScR framework. Relevant studies published between 2010 and 2025 were identified through an extensive search of major academic databases. The retrieved literature was analyzed through thematic synthesis. Findings indicate that the primary drivers of student AI adoption are the perceived enhancement of academic performance and the promise of personalized learning experiences. However, significant challenges include inadequate digital infrastructure, limited AI literacy among students and faculty, and a lack of clear institutional policies on AI use. Ethical concerns, particularly regarding data privacy and the potential for academic dishonesty, also emerged as major deterrents. In conclusion, while Kenyan students demonstrate a strong willingness to embrace AI, the adoption rate is hampered by systemic and institutional barriers. The paper recommends that Kenyan universities invest in robust digital infrastructure, develop comprehensive AI literacy programs, and establish clear ethical guidelines to facilitate responsible and equitable AI integration. These interventions are key for unlocking AI's potential to enhance learning outcomes and prepare students for the future workforce.

Keywords: Artificial Intelligence, Higher Education, Kenya, Student Adoption, Drivers, Challenges, UTAUT, Digital Divide

Psychological Issues Associated with Artificial Intelligence (AI) among University Students in their Pursuit of Academic Success. A Review

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Abstract

Artificial intelligence can be viewed as cognitively human-like technologies behaving in human-like ways. It is also regarded as reason-capable technologies acting rationally. Artificial Intelligence has revolutionized the field of education immensely with varied views from the consumers. As students engage AI in their daily academic pursuit, it has come with untold effects on their mental health. Although AI increase opportunities for individualized learning which is paramount in academic success, it has also impacted negatively on the students' psychological well being. The review found out that the students' use of AI has culminated into mental health issues such as digital fatigue, technostress, depression, anxiety, stress, loneliness, frustrations, boredom, worry, fear, sleep and eating disorders. The study recommended that there is need to focus on an AI blended transformative system that not only support the student academic success but also focus on the well being of the students' mental health.

Keywords: Artificial Intelligence, Psychological issues, Academic Success, University Students, Mental Health, digital fatigue, technostress.

Influencing Information Seeking Behavior among the Students of Bomet University with an Artificially Intelligent Conversational Agent

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Abstract

Past literature indicated that information-seeking activity is characterized as the amount of all activities typically performed by higher education students to gather, use, and process any type of information required to accomplish their studies. It is the way students go about searching for information which involves purposeful information seeking as a result of the need to register for a programme, amount of scholarship/helb/house-hold amount, register unit, register for a semester, access class timetable, download exam, access academic transcripts, portal/email login password all of which can be classified as simple and routine and accounts for 80% of request for information made by students. Perhaps the countless types of information as well as numerous support services in different schools or departments to be available in a single platform needs special application to assist students to meet their needs. The increase of web-based information accessible via the Internet and the development in website and related digital technology will enable students in get access to information they require at the comfort of their rooms. Bomet University (BUC) currently has a population of over 7000 students who require support service from the limited number of staff who are also on their day-to-day basis engaged on other operations of the university. Help unavailable when needed is one of the major reasons for service delivery failure, which in turn leads to user dissatisfaction. As a result, support staff are no longer available for high level and proactive support activity because their time are mainly occupied by attending these simple and routine enquiries. The AI agent will provide information, guidance and reports so as to enhance students' ability to manage their time and concentrate on their academic goals as well as improve service delivery by the university. Data was collected from schools, finance and ICT and was used to build a knowledge base for the AI agent. The proposed innovation will be deployed and accessed through smart phone or university website.

Machine Learning Integrated Optical Sensor and Microcontroller System to Detect Heavy Metals

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Abstract

Heavy metal contamination in water poses serious environmental and health risks, demanding rapid and cost effective detection methods. This study developed an optical sensor system for detecting lead (Pb^{2+}), copper (Cu^{2+}), and iron (Fe^{3+}) ions using a TCS3200 color sensor integrated with an Arduino Uno microcontroller. The device measured RGB light intensities from reagent induced color changes dithizone for Pb^{2+} , ammonia for Cu^{2+} , and 1,10-phenanthroline for Fe^{3+} . RGB data were processed in Python using supervised learning algorithms: Random Forest (RF) and Artificial Neural Network (ANN). The RF model achieved $R^2 = 0.97$, MAE = 0.05 ppm, and 95% accuracy, while the ANN achieved $R^2 = 0.95$, MAE = 0.06 ppm, and 93% accuracy. Compared to conventional Atomic Absorption Spectroscopy (AAS) and Inductively Coupled Plasma (ICP) methods, which are accurate but costly and laboratory based, the proposed system is portable, inexpensive, and delivers rapid results (10 seconds per sample). Unlike previous optical sensing approaches relying on manual calibration, this system integrates machine learning to enhance precision and adaptability. The results demonstrate that combining optical sensors with machine learning provides an efficient, scalable solution for real time monitoring of heavy metals in water.

Keywords: Machine learning, optical sensor, TCS3200, Arduino Uno, heavy metals, Random Forest

Nafasi ya Akili Unde (AI) Katika Kuboresha Ujifunzaji na Ufundishaji wa Lugha ya Kiswahili Katika Shule Nchini Kenya.

KIRUI SIMON KIPKOECH - CHUO KISHIRIKISHI CHA BOMET

IKISIRI

Ujumuishaji wa Akili Unde (AI) katika shule za Kenya unabadilisha namna ya kujifunza lugha ya Kiswahili kwa kutoa uzoefu wa kibinafsi, kuboresha ufasaha, na kuziba pengo la rasilimali. Zana zinazoendeshwa na AI hutoa nyenzo za kuvutia, mrejesho wa papo hapo, na vifaa vilivyobinafsishwa vinavyokidhi mitindo mbalimbali ya kujifunza. Hata hivyo, utekelezaji wa mafanikio unahitaji mafunzo kwa walimu, uboreshaji wa miundombinu ya kidijitali, na msaada wa sera ili kuhakikisha upatikanaji wa haki na ujumuishaji wa ufanisi. Kwa kutumia uwezo wa AI, Kenya inaweza kuimarisha elimu ya lugha ya Kiswahili, kukuza utambulisho wa kitamaduni na mshikamano wa kitaifa. Wasilisho hili litachunguza zana za AI zinazotumika katika ujifunzaji na ufundishaji wa Kiswahili, jinsi zana hizi zinavyochangia katika katika uelewa wa sarufi, fasihi, tafsiri, na mawasiliano katika lugha ya Kiswahili. Isitoshe, utafiti huu utatoa mapendekezo au mikakati inayoweza kutumika kuimarisha matumizi ya AI katika somo la Kiswahili kwa kuzingatia malengo ya CBC na Ruwaza ya Kenya 2030. Utafiti huu utaongozwa na nadharia ya Piaget (1971) unaoshikilia kuwa akili ya mtoto hukua kulingana na mtagusano wake na mazingira.

Leveraging Artificial Intelligence for Risk Management in the Banking Industry: Enhancing Financial Performance through Intelligent Systems

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Abstract

The global banking industry faces an evolving landscape of risk characterized by rapid digitization, growing regulatory demands, and increasingly sophisticated fraud and market behaviors. In this context, artificial intelligence (AI) is emerging as a transformative force in modern risk management practices. This paper presents a comprehensive review of existing academic and industry literature to explore how AI technologies—particularly machine learning, deep learning, and natural language processing—are being deployed to manage risk in the banking sector. The analysis highlights AI's potential to improve credit risk evaluation, fraud detection, market forecasting, and compliance monitoring, thereby contributing to more informed decision-making and enhanced financial performance. At the same time, the review identifies significant challenges related to model transparency, data quality, and regulatory compliance. Synthesizing the reviewed evidence, the paper offers a conceptual model linking AI-enhanced risk management with financial performance and outlines future research directions for both scholars and practitioners.

Keywords: Artificial Intelligence, Risk Management, Banking, Financial Performance, Machine Learning, Fraud Detection, Credit Risk, Compliance

A Mathematical Model for Evaluating AI Priority Factors for Kenya

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Abstract

The United States recently unveiled its National Artificial Intelligence (AI) Legislative Framework. Overwhelming evidence from the literature points to an increasing use of AI across all sectors of African society, and this trend will continue well into the future. Moreover, there are indications of AI use in governance across African countries, including Kenya. However, recent studies on global technological advancements have highlighted Africa's limited role in AI datasets, and by extension, AI technology itself. This situation poses potential risks, including bias and exclusion. To mitigate these risks under technological uncertainties, the African Union adopted a Landmark Continental AI Strategy in 2024. This paper hypothesizes that the lack of a scientific decision model to evaluate AI priority factors for Africa may negatively impact the acceptability and adoption of this vital technology. As such, the study proposes a mathematical model to assist decision-makers in managing the use of AI within their territorial boundaries to improve service delivery to the citizens.

Keywords: AI dataset, continental AI strategy, mathematical model

AI- Powered Generation: Redefining the Grief Process among the Luo Community of Western Kenya and Its Implication in Mental Health Management

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Abstract

Grief is both a universal and culturally specific phenomenon. Among the Nilotic Luo community of Western Kenya, the process is marked by rituals, oral traditions and social-cultural collectivism that have historically played a central role in navigating loss. However, with the emergence of technological advances, grief expression and processing is also reshaping. This paper examines how digital technologies such as virtual memorials, grief Chabot, generative storytelling and audio-preservation tools intersects with Luo cultural mourning practices, and the implications for culturally-sensitive mental health management. The study uses literature review of existing ethnographic accounts of Luo funeral rites and contemporary studies of digital mourning. It highlights possible benefits, challenges and cultural considerations in redefining grief within a cultural context deeply embedded in traditional heritage. The paper aims at exploring the possibility of designing culturally-sensitive AI grief interventions. Key concern is the impact of such interventions on socio-mental wellbeing of the society, taking the Luo community of Kenya as case of study.

Key words: AI, digital technologies, funeral rites, grief, Luo, mourning, virtual memories.

The Role of Digital Transformation and Organizational Performance

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Abstract

Digital transformation, driven by Artificial Intelligence (AI) and other emerging technologies, has become a cornerstone for achieving sustainable organizational performance and economic transformation. In Kenya, both public and private sector institutions are increasingly embracing digital tools to enhance efficiency, responsiveness, and competitiveness in a rapidly evolving business landscape. This paper examines the role of digital transformation in improving organizational performance through enhanced customer experience, operational efficiency, and strategic adaptability. Anchored on a synthesis of recent empirical and theoretical literature, the study highlights how AI-powered innovations such as data analytics, automation, and machine learning enable organizations to streamline operations, optimize decision-making, and improve service delivery. Findings reveal that while organizations in developed economies have leveraged AI-driven digital transformation to achieve superior performance and sustainable growth, many developing countries, including Kenya, still grapple with challenges such as limited digital infrastructure, resource constraints, and resistance to technological change. The paper underscores the need for strategic investment in AI-driven digital initiatives, capacity building, and supportive policy frameworks to unlock the full potential of digital transformation for economic and organizational advancement.

Keywords: Artificial Intelligence, Digital Transformation, Operational Efficiency, Customer Experience, Organizational Performance, Economic Transformation, Kenya.

Generative AI in Geography Assessment: Transforming Geography Assessment in Higher Education Systems with AI in Sub-Sahara Africa

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Abstract

This study explores the evolving role of generative artificial intelligence (AI) and its growing influence, particularly within the education sector. While current applications often focus on automating essay writing or generating quiz content, the potential of generative AI extends far beyond these uses. With the ability to produce text, speech, images, and even videos from simple prompts, generative AI can support a wide range of educational functions—from summarizing knowledge and giving instructions to enhancing communication about complex topics. The technology's accessibility continues to expand, with a variety of tools and platforms now offering advanced language, image, and video generation capabilities. Many of these systems operate through chatbots and dialogue interfaces that respond dynamically to user inputs. Although generative AI models may share foundational principles, they often specialize in different tasks based on their architecture and training data. The main aim of this informative research is to clarify the institution's perspective on the planned use of Generative Artificial Intelligence (GenAI) in the assessment of university geography students, and the expectations regarding the responsibilities of academic staff and students. Data was collected through interviews conducted with geography teachers at tertiary institutions provided relevant learning opportunities to the learners. The findings reveal Chatbot training which the generative AI is the same; showing has a bearing significant on the geography assessment. Therefore, results suggest an acceptable performance generative AI for an inter-rater reliability value based on a significance level as a post-hoc test to enable the model to generalize well to other regions but the generative AI does not capture the student's response well, hence lacking feedback response to the instructor or lecturer. According to the scatter plot, R^2 linear = .235 indicates that generative AI influences 24% of geography assessment variation, whereas other factors influence 76%. According to the linear regression equation, geography assessment rises by 0.42 for every unit increase in generative AI. The statistical significance of the relationship between geographical assessment and generative AI ($r=.240$, $P>0.05$) indicates that students' geography assessment (negative self-efficacy) increases with generative AI rise, (positive attitude). Therefore, it's advisable to minimize the use of generative AI in assessing students. The study articulates the comprehensive rationale for the overall assessment strategy - including a clear explanation of the general objectives for adopting GenAI tools at the course level, and the methods of expecting them to be addressed at the subject level. To guarantee the transparency of GenAI technology's anticipated use in a new setting, it is critical to ensure that there is a shared understanding between academics, administration, and students. Consequently, a step forward is taken, and it anticipates feedback from the stakeholders to build a more robust framework.

Keywords: Generative AI; Education; Personalization; Creativity; Gamification; Chatbot; Learning technology; Educational innovation; AI in education; Content generation

Artificial Intelligence for Capital Market Regulation in Developed and Emerging Economies: A Critical Review of Literature

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Abstract

The study sought to examine artificial intelligence for capital market regulation in developed and emerging economies with a focus on use, risks and governance frameworks. The study was underpinned by the Unified Theory of Acceptance and Use of Technology, Public Interest Theory of Regulation and Efficient Market Hypothesis. The study critically examined empirical studies, regulatory reports, working papers and technical reports to achieve the research objectives. The study established that the utilisation of Artificial Intelligence in the regulation of capital markets has revolutionised supervisory roles by improving regulators' abilities to identify, forecast, and address financial misconduct, systemic risks, money laundering detection, and financial reporting, among other applications. However, such use is accompanied by various risks and challenges such as data quality, model, operational, ethical and systemic risks. In an effort to subdue the risks, various strategies have been proposed, such as risk-based regulation, strong model governance, transparency and auditability, management of third-party risks, data governance, and accountability through human oversight. Moreover, the study established that market authorities in developed and emerging economies differ significantly in terms of AI used, risks faced and government frameworks adopted. Advanced economies encounter challenges such as legal defensibility, model correlation, and concentration risk, while emerging economies face obstacles like data scarcity, budget constraints, and a shortage of skilled personnel. The study recommends that policymakers and regulators should enhance data governance, institutionalise AI model risk management, collaborate across jurisdictions in AI regulations and invest in supervisory technology (SupTech) infrastructure and AI literacy to enhance regulatory capacity. Despite the increasing body of evidence, future research should create open-access datasets, and assess ethical and interpretability frameworks in AI-assisted supervision. Further, it is crucial to foster collaborative, interdisciplinary research promote the development of context-sensitive AI governance models that are appropriate for diverse institutional capacities and developmental contexts.

Keywords: Artificial Intelligence, Capital Market Regulation, Supervisory Technology, Market Surveillance, Systemic Risk, Emerging Economies, Machine Learning, Governance Frameworks.

Social Media Influence on Thinking and Behaviour among the Youth in Kenya.

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Abstract

The influence of social media on the cognitive patterns and behavioral tendencies of youth in Kenya presents a dual-edged impact, fostering both constructive and detrimental outcomes. While social media platforms have enhanced communication, creativity, and access to information, there is growing concern regarding their role in promoting antisocial behavior and distorted thinking patterns among young people. This study seeks to examine the influence of social media on the thinking and behavior of Kenyan youth. Specifically, the objectives are: To identify the types of social media most influential among youth; to determine how these platforms affect cognitive and behavioral development; to assess the overall impact, both positive and negative of social media on youth; and to propose evidence-based recommendations for mitigating adverse effects while enhancing positive outcomes. The research will adopt a qualitative desk-based methodology, relying on secondary data sourced from existing scholarly publications, reports, and digital repositories. The study will be grounded in the Social Cognitive Theory, which emphasizes observational learning and modeling, and the Uses and Gratifications Theory, which explores the motivations behind media usage and the satisfaction it provides. These frameworks will guide the analysis of how social media content and interactions influence youth behavior and mental frameworks. Findings from this study will illuminate the multifaceted effects of social media, particularly its potential to contribute to harmful behavioral patterns such as cyber bullying, addiction, and identity distortion. Recommendations will include the development of digital literacy initiatives aimed at promoting responsible use of social media among youth, as well as policy formulations to regulate content authenticity and platform accountability. Ultimately, the study aims to inform stakeholders, educators, policymakers, guardians, and youth advocates on strategies to harness the trans-formative potential of social media while curbing its risks.

Learning English in higher institutions in the face of AI: Opportunities and Challenges: The Case of Bomet University College. Artificial Intelligence in Education

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Abstract

Learning through discovery is an educational approach where students learn by actively exploring, asking questions, and solving problems themselves, rather than being directly told information. Learning through discovery offers benefits such as improved knowledge retention, deeper understanding, and the development of critical thinking, problem-solving, and creativity. It fosters intrinsic motivation and autonomy, leading to more meaningful learning and the development of valuable life-long learning skills. This active, self-directed approach encourages curiosity and builds confidence in learners by allowing them to construct their own knowledge and take ownership of their learning process. This method of learning emphasizes student autonomy, hands-on experiences, and the construction of personal understanding, leading to increased engagement, better retention, and the development of critical thinking and problem-solving skills. Teachers act as guides, providing resources and asking open-ended questions to facilitate the learning process. In Kenya, the Competency Education is replacing the previous 8:4:4 Curriculum. The rationale for this shift, among others, is that CBE encourages critical thinking, creativity and problem solving. Today, many students in institutions of higher learning have turned to artificial intelligence (AI) to carry out their tasks. Right from assignments to revising for exams, this is the order of things. Many institutions of higher learning in Kenya boast of stable and sufficient internet making it easy for learners to install and use Chat Generative Pre-Trained Transformer (ChatGPT), which was developed by Open AI Company. This is a chatbot technology that can process our natural human language and generate a response. That means that learners only need to feed the ChatGPT with a question and the answers are generated. This study investigates the opportunities and challenges of teaching and learning in English using AI among students specializing in English and literature at Bomet University College. The study is anchored on Zone of Proximal Development (ZPD) theory, introduced by Lev Vygotsky in his 1978 work, which emphasizes the difference between what a learner can achieve independently and what they can achieve with the guidance of a more knowledgeable person, like a teacher or peer. Learning is most effective within the ZPD, where support is provided to help a learner develop skills that are currently beyond their independent capabilities, a concept also known as scaffolding. He underscores the role of language in cognitive development. The study will adopt descriptive survey research design to get learners' views on learning English using AI. The target population will be 300 students taking English and literature at BUC. Stratified sampling will be used to group the students in categories ie second, third and fourth year where simple random sampling will be used to 100 students from each year of study. Data will be collected using focus group discussions, interviews and questionnaires. The collected data will be analyzed descriptively using measures of central tendencies; median, mode and mean. The data collected will be analyzed using inferential statistics. The study will offer insights on opportunities and challenges of using AI in learning English language. This will form the basis for recommendation for program review and modes of assessment for learners at institutions of higher learning.

Impact of Generalized Anxiety Disorder on Academic Performance and Experiences among Kenyan Undergraduate Students

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Abstract

Generalized Anxiety Disorder (GAD) is a common mental health condition with significant effects on academic performance; however, there is limited empirical evidence on its impact among undergraduate students in Kenya. This study explored the effect of GAD on academic performance and student experiences at Bomet University, based on cognitive-behavioral theory. A mixed- methods approach was used, combining quantitative data from the Generalized Anxiety Disorder 7-item (GAD-7) scale and structured questionnaires with qualitative data from semi-structured interviews. A total of 463 valid responses were analyzed. Participants were categorized into Minimal (57.6%), Mild (25.3%), Moderate (11.9%), and Severe (5.2%) levels of GAD, with a mean GAD-7 score of 4.73 (SD = 5.06). The internal consistency of academic-related variables was acceptable (Cronbach's $\alpha = 0.719$). Spearman's correlation analysis revealed strong positive associations between GAD and reduced concentration ($\rho = 0.573$, $p < .001$) and increased academic stress ($\rho = 0.554$, $p < .001$). Moderate associations were observed between GAD and impaired concentration ($\rho = 0.460$, $p < .001$), while weaker associations were found with reduced confidence in academic goals ($\rho = 0.255$, $p < .001$). Qualitative findings further highlighted themes of self-doubt, perfectionism, and academic avoidance. The findings demonstrate that GAD significantly affects both academic performance and students' academic experiences. This study contributes to the limited body of literature on student mental health in Kenya. It underscores the need for institution- and policy-level interventions to strengthen mental health support systems for undergraduate students, with implications for similar contexts in Sub-Saharan Africa.

Keywords: Generalized Anxiety Disorder, academic performance, academic experiences, university students, Kenya

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