KIBABII UNIVERSITY

7th
Biennial International
Conference

BOOK OF ABSTRACTS

THEME:

"HARNESSING INNOVATION FOR SUSTAINABLE GROWTH"

KIBABII UNIVERSITY 7TH BIENNIAL VIRTUAL INTERNATIONAL CONFERENCE

THEME:
"HARNESSING INNOVATION FOR SUSTAINABLE GROWTH"

11TH – 12TH JUNE, 2025

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7TH BIENNIAL INTERNATIONAL CONFERENCE (VIRTUAL)

Conference Objective

To provide a forum for academicians, researchers, entrepreneurs, students, and other stakeholders to present their research and expert opinions on harnessing sector-specific innovations to drive sustainability, enhance resilience, and promote inclusive growth in response to global trends

CONFERENCE BOOK OF ABSTRACTS

OVERARCHING THEME

Harnessing Innovation for Sustainable Growth

S/N	Sub-theme	Strands	Statistics	Total
1)	Agriculture and Food Security	- Smart farming technologies and climate-resilient agriculture - Agro-industrial value chains for sustainable rural development - Food safety, nutrition, and emerging dietary trends - Innovations in water soil management for agricultural productivity - Digital tools for precision farming and supply chain management	23	
2)	Health and Well-Being	- Telemedicine and AI in healthcare delivery - Public health innovations for pandemics and disaster preparedness - Mental health in the digital age - Biotechnology and personalized medicine advancements - Sustainable healthcare systems and universal health coverage	29	
3)	Energy and Environment	- Renewable energy technologies and grid modernization - Climate-smart solutions for energy-intensive industries - Conservation strategies for biodiversity and ecosystems. - Waste-to-energy innovations and circular economy practices - Carbon-neutral cities and green building technologies	8	167
4)	Education and Human Capital Development	- Digital learning platforms and AI-driven education models. - Skills development for future job markets - Inclusive education for marginalized and rural communities. - Lifelong learning strategies in a dynamic world - Academic-industry research partnerships for societal impact	39	
5)	Governance and Policy Innovation	- E-governance and digital public service delivery - Policy frameworks for sustainable urban and rural development - Data-driven decision-making for public policy effectiveness. - Ethics and accountability in digital governance - Inclusive policy-making for climate and economic resilience	15	
6)	Cross Cutting Issues	- Business and Industry - ICT and Digital Transformation - Science, Technology, Engineering, and Mathematics (STEM) - Social Sciences and Humanities - Law and Policy - Digital Forensic and Justice management	53	

CHIEF GUEST

Prof. Miriam Kinyua

Professor of Plant Breeding and Biotechnology,
University of Eldoret, Kenya

Key-Note Speakers

S/N	Sub-theme	Name and Affiliation
1.	Agriculture and Food Security	**Sharon Basada Singzon, D.Tech.Sc.** Associate Professor and Dean, Graduate School Eastern Samar State University, Philippines **Prof. Chrisantus M. Tanga** Research Scientist Insects for Food, Feed and other Uses (INSEFF) Program; International Centre of Insect Physiology & Ecology (ICIPE) P.O. Box 30772-00100, Nairobi, Kenya
2.	Health and Well-Being	**Prof. Collins Ouma** Maseno University, Kenya **Prof. Fabian Esamai** Faculty of Health Sciences, Moi University, P.O. Box 4606 30100, Eldoret, Kenya
3.	Energy and Environment	**Mr. Issak Elmi** Deputy Director, National Environment Management Authority (NEMA) P.O. BOX 67839-00200, Nairobi, Kenya
4.	Education and Human Capital Development	**Prof. Fredrick Muyia Nafukho** Foster School of Business University of Washington, Seattle, Washington, USA
5.	Governance and Policy Innovation	**Prof. Maurice Amutabi** Deputy Vice Chancellor, Academic and Student Affairs (DVC-ASA); P.O. BOX 62157-00200 Nairobi, Kenya Technical University of Kenya (TUK)
6.	Cross Cutting Issues	**Prof. Calvin Odero** University of Florida, USA/ Associate Center Director, Extension Weed Specialist

GUEST SPEAKERS PROFILES

Prof. Sharon Basada Singzon

Prof. Sharon Basada Singzon is an accomplished academic, researcher, and university administrator with extensive experience in agricultural systems and higher education leadership. She currently serves as the Dean of the Graduate School at Eastern Samar State University (ESSU) in the Philippines, where she also holds the rank of Associate Professor. Since joining ESSU in 1999, Prof. Singzon has played various key roles, including Dean of the College of Agriculture and Natural Sciences, Director of the University's Intellectual Property and Innovation offices, and Program Head for multiple departments in the agricultural and environmental sciences. Prof. Singzon holds a Doctor of Technical Science in Agricultural Systems and Engineering from the Asian Institute of Technology (AIT) in Thailand, where she specialized in Integrated Watershed Development and Management. Her doctoral dissertation focused on the dynamics and constraints of crop-livestock integration in a Thai watershed community. She also earned her Master of Science in Agricultural Systems from AIT, completing a thesis on the impact of mechanization on livestock roles in Thailand's farming systems. Her academic journey began at the Visayas State College of Agriculture (now Visayas State University), where she graduated Magna Cum Laude with a Bachelor's degree in Animal Science, majoring in Animal Health. Prof. Singzon has broadened her expertise through international short courses and fellowships. She trained in geoinformatics for disaster risk reduction, legal pluralism, and poultry husbandry through programs held in the Netherlands, Indonesia, and the Philippines. Her academic excellence and commitment to development work have earned her several prestigious scholarships and awards, including the Akio Morita Award, ASEAN Research Scholarship, and a doctoral fellowship from DANIDA. A prolific researcher, Prof. Singzon has authored and co-authored numerous peer-reviewed publications on topics ranging from indigenous swine breeding and climate-resilient livestock systems to agricultural credit and disaster resilience. She has presented her work at international conferences in Thailand, Indonesia, Korea, and Poland. Her research collaborations have included projects funded by PCAARRD, SEARCA, DENR, and international development agencies. Notably, she played a leading role in research on the conservation and utilization of Philippine native pigs and in evaluating ecosystem services in protected landscapes. Beyond research, Prof. Singzon is actively engaged in international academic exchanges. She served as a visiting professor at Pyongyang University of Science and Technology in North Korea and has been a plenary speaker and guest lecturer for universities in Indonesia. Her international engagements reflect her commitment to sharing knowledge across borders and strengthening academic partnerships. As an educator, she has taught a wide array of undergraduate and graduate courses, including poultry production, animal nutrition, genetics, microbiology, and climate-smart agriculture. Her interdisciplinary teaching approach reflects her deep understanding of both animal and crop science, as well as her emphasis on sustainable and integrated farming systems. With over 30 years of experience in teaching, research, and development work, Prof. Sharon Singzon continues to be a leading figure in agricultural education and rural innovation in the Philippines and Southeast Asia. Her contributions

demonstrate a deep commitment to environmental sustainability, academic excellence, and community-based development.

Prof. Fred Muyia Nafukho

Prof. Fred Muyia Nafukho serves as Vice Provost for Academic Personnel & Faculty, and Professor of Management and Organization at the Foster School of Business, and adjunct Professor in the College of Education, and holds the Presidential Term Professorship at the University of Washington, Seattle, Washington, USA. His research focuses on policy analysis within international and comparative education, investment in human capital development, emotional intelligence and leadership development, and organizational development and change. He has received numerous awards, honors, and fellowships in recognition of his scholarship such as the Fulbright Scholarship in 1996, Outstanding HRD Scholar Award in 2019, the Carnegie African Diaspora Fellowship in 2016, Arkansas Business Teacher Educator of the Year Award in 2004, and Outstanding New Faculty Award at Texas A&M University. Prof. Nafukho also served as Professor of Educational Administration and Human Resource Development, Senior Associate Dean for Faculty Affairs, and Department Chair, College of Education and Human Development at Texas A&M University. He earned his Ph.D. in Leadership and Human Resource Development from Louisiana State University, M.Ed. in Economics of Education and B.Ed. in Business Studies and Economics from Kenyatta University, Kenya. He was a Senior Lecturer of Economics of Education at Moi University, Kenya, an Assistant Professor and Associate Professor of Human Resource Development at the University of Arkansas, Fayetteville. Dr. Nafukho has authored, co-authored/edited 11 books, 2 handbooks, 70 refereed journal articles, 29 book chapters, and made over 200 keynote and refereed conference presentations. Prof. Nafukho has received numerous grant funding as a principal investigator or co-principal investigator to support his research and graduate students. He has graduated 20 doctoral students as chair/co-chair, and served on 32 doctoral dissertation committees, as chair of 47 masters students, and as host for 4 Fulbright/postdoctoral fellows.

Prof. Collins Ouma's

Prof. Collins Ouma is a highly accomplished geneticist and immunologist specializing in both infectious and non-infectious diseases. He holds a PhD in Human Genetics from Kenyatta University and completed his postdoctoral training at the University of New Mexico and the University of Pittsburgh. Currently, he serves as the Director of Research and Innovations at Maseno University, where he has previously held leadership roles, including Dean of the School of Public Health and Community Development. His research focuses on the immunogenetics of diseases, particularly the genetic basis of severe malarial anemia, HIV, tuberculosis, and various cancers. He has also worked with esteemed institutions such as the Kenya Medical Research Institute (KEMRI) and the African Population and Health Research Center (APHRC), significantly contributing to disease research and public health strategies in Kenya.

Prof. Ouma has demonstrated strong capabilities in virology, particularly in HPV-related research. His studies have examined barriers to HPV vaccine introduction in Kenya and strategies to improve cervical cancer screening. His work highlights the genetic and immunological factors influencing viral infections and their progression, emphasizing the importance of early detection and prevention. His contributions to virology extend beyond HPV to other viruses, including HIV and co-infections with tuberculosis, making him a key figure in advancing infectious disease research in Africa. Recognized for his impactful work, he has received prestigious honors such as the Royal Society Pfizer Award and is an active fellow for both the Kenya National Academy of Sciences and Africa Academy of Sciences.

Beyond his research endeavors, Prof. Ouma is deeply committed to mentorship and capacity building. He has mentored over 100 postgraduate students, including 30 doctoral graduates, fostering the next generation of scientists and researchers. As the founder and Patron of the Society of Professional Researchers in Biomedical Science (SPRBS), he has created a dynamic platform that brings together researchers from diverse backgrounds, offering mentorship, networking opportunities, and a space to nurture talent. His leadership in these initiatives underscores his dedication to advancing biomedical science and supporting emerging researchers in Africa.

Prof. Fabian Esamai

Prof. Fabian Esamai is a distinguished Medical Doctor who earned his MBChB from the University of Nairobi in 1978. He completed his internship at Kenyatta National Hospital and worked as a Medical Officer at Nyanza General Hospital in 1979. In 1980, he joined the Master of Medicine in Paediatrics program at the University of Nairobi, graduating in 1984. He later obtained a Master of Public Health from Johns Hopkins University (1996) and a PhD from Linköping University, Sweden (2002).

In 1984, Prof. Esamai became the first Paediatrician at Kericho District Hospital. He later served as the Medical Officer of Health (1987) and Medical Superintendent (1988–1990). In 1990, he joined Moi University as a Lecturer in Child Health and Paediatrics, rising through the ranks to become Professor in 2005. He has held several academic leadership roles, including Head of Paediatrics (1997–2003), Dean of the School of Medicine (2005–2009), and Principal of the College of Health Sciences (2011–2016). He delivered Moi University's second inaugural lecture in 2007, becoming Kenya's first Paediatrician to do so.

Prof. Esamai has supervised 10 PhD and 50 Master's graduates and contributed significantly to curriculum development at Moi University. He has served on the Moi University Senate since 1997 and held various leadership roles in the university's governance structures, including the Management and University Council.

An accomplished researcher, he has authored over 230 publications in peer-reviewed journals and has presented extensively at conferences. He chaired the Consortium for National Health Research (2007–2016), served on the Kenya Science, Technology and Innovation Award Jury (2012–2016), and has been a commissioner with the East Africa Health Research Commission since 2016.

He reviews for several leading medical journals and has been an external examiner in universities across East Africa. He is an active member of the Kenya Medical Association, Kenya Paediatrics Association, and national technical working groups on child health and immunisation.

As the Research Chair for Health Systems under NACOSTI/IDRC since 2015, Prof. Esamai has led maternal and child health research initiatives. He has secured major research funding since 1994, managing grants exceeding $1 million annually since 2006.

He led the design and development of major infrastructure projects, including the Riley Mother Baby Hospital at MTRH and key buildings in the College of Health Sciences. From 2016 to 2022, he served as Principal of Alupe University College, guiding it from inception to full university status in 2022. He also served as Acting Vice Chancellor of Alupe University from August 2022 to August 2023.

Prof. Esamai retired in July 2024 and now Professor Emeritus at Moi University.

Participating Institutions, Organizations and Respective Countries

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2.	Ahmadu Bello University	Zaria, Nigeria
3.	Alupe University	Busia, Kenya
4.	Bayero University	Kano, Nigeria
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19.	Kibabii University (KIBU)	Bungoma, Kenya
20.	Laikipia University	Kenya
21.	Maseno University	Kenya
22.	Masinde Muliro University of Science and Technology (MMUST)	Kenya
23.	Moi University	Kenya
24.	Mount Kigali University	Kigali, Rwanda
25.	National Open University of Nigeria	Nigeria
26.	Nigeria Police Academy	Nigeria
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BOOK OF ABSTRACTS

SUB-THEME #1

AGRICULTURE AND FOOD SECURITY

Evaluation of integrated nutrient management options for maize production in humid and sub-humid zones of Western Kenya

John W Makokha[a,*], Collins Majengo[b], Kennedy Munyole[a], Alex Kiptorus[c], Jonah K. Ngeno[d]

[a]Department of Science Technology and Engineering, Kibabii University,
P.O. Box 1699-50200, Bungoma, Kenya.
[b]Department of Agriculture and Veterinary Sciences, Kibabii University,
P.O. Box 1699-50200, Bungoma, Kenya.
[c]Amani Community Based Organization –ACBO, P.O. Box 337-50202, Chwele, Kenya.
[d]Department of Seed, Crop and Horticultural Sciences, University of Eldoret,
P.O. Box 1125-30100, Eldoret, Kenya.

Abstract

Maize is an important food security crop in Kenya, but its average production is below two (2) metric tonnes (t) ha^{-1}, against a potential yield of 11t ha^{-1}. One of the causes of low yield is low soil fertility. To restore soil fertility with a view of increasing yields, the present study seeks to integrate nutrient management that involves the use of both organic and inorganic manure on the farm. Biochar and human urine can serve as organic nutrient sources for crop production, but their efficacy in maize production has not been well documented in Kenyan soils. A pot experiment in a greenhouse was conducted at one site in Kibabii University, Bungoma County of Kenya to determine the effects of biochar alone or its combination with human urine; poultry manure, and DAP fertilizer on the growth of maize in soils collected from five farms. An unpaired t–test was used to compare the grain yield response of maize to biochar and non-biochar application on seventeen (17) farmer fields in Kapsokwony division of Bungoma County, Kenya. Soil amendment with biochar and human urine significantly enhanced stem diameter in two (2) sites compared to other treatments, and soil amendment with biochar alone consistently enhanced shoot dry weight and % shoot dry weight in two (2) and three (3) soil samples, respectively. Soil amendment with biochar further increased grain yield compared to the untreated control in 82% of farmer fields. However, the highest grain yield recorded in biochar-treated maize was 6t ha^{-1}, which was a shortfall of 5t ha^{-1} of the potential yield. This suggests that the application of biochar alone cannot meet the nutrient requirements of maize in the study area. It is recommended that similar studies be done in multiple locations under an integrated approach with diverse inorganic fertilizers.

*Keyword*s: Biochar, grain yield, human urine, organic manure, *Zea mays*

Aqueous Precipitation of Struvite from Wastewater and Hot Spring Water as an Alternative Inorganic Fertilizer

Francis Maingi, Edith Nasambu, Linda Ouma
Department of Science Technology and Engineering, Kibabii University, Bungoma, Kenya.
fmaingi@kibu.ac.ke-+254721567172
louma@kibu.ac.ke +254725416414
edithwamechi@gmail.com+254708952218

Abstract

Struvite, with the chemical formula $MgNH_4PO_4.6H_2O$, has garnered increased attention among researchers for its potential as a valuable nutrient for plants in the agricultural sector. The cost of producing this mineral depends largely on the cost of the magnesium source utilized. This research focused on exploring hot spring water as a potentially more economical natural magnesium ion source, while sewage wastewater was employed as a supplier of phosphate and ammonium ions for synthesizing struvite. The produced struvite composite underwent characterization through X-ray fluorescence (XRF), X-ray diffraction (XRD), and Scanning electron microscope (SEM). The purity of the precipitate and the recovery of phosphorous were assessed. XRF findings indicated that the synthesized struvite predominantly comprised magnesium oxide and phosphorous oxide. XRD analysis revealed the existence of orthorhombic crystalline phases in the range of 4-9 degrees (2θ), with struvite peaks at 2θ values 15.8, 20.9, and 46.3, consistent with information from the struvite ICDD card. SEM unveiled irregular, crystalline, and rod-like morphological structures consistent with those documented in the literature. The synthesized composite exhibited a purity percentage of 68.61% and a phosphorous recovery rate of 76.15%. The composite's inclusion of phosphorous and nitrogen, which are essential plant macronutrients, renders it a potential inorganic fertilizer for agricultural use.

Keywords: Characterization, Hot spring water, Struvite, Synthesis, Wastewater

Enhancing Iron Uptake in Spinach (*Spinacia oleracea*) Through Treatment with Sugarcane Bagasse Biochar Iron Composite

Meshack Mutungi Kamaau[1*], Harun Mbuvi[1], Francis Maingi[2]

[1]Department of Chemistry, Kenyatta University, Nairobi, Kenya

[2]Department of Science Technology and Engineering, Kibabii University, Bungoma, Kenya.

22088.2022@students.ku.ac.ke +254719474109

Abstract

Iron (Fe) deficiency in *Spinacia oleracea* leads to poor growth, chlorosis, and reduced yields, particularly in alkaline soils where iron bioavailability is low. Conventional iron fertilizers are often ineffective due to poor solubility and rapid precipitation. This study investigated the potential of a sugarcane bagasse biochar–iron composite to enhance iron uptake in spinach. Biochar was synthesized through pyrolysis and treated with 0.25 M, 0.50 M, and 0.75 M $FeCl_3$ at 1:5, 1:10, and 1:15 (w/v) ratios to form the composite. FTIR and XRF analyses confirmed iron incorporation and the presence of functional groups (–OH, –COOH) that facilitate iron binding. A greenhouse experiment using a randomized complete block design (RCBD) assessed composite effects on spinach growth. Iron concentration was measured by AAS and data analyzed by ANOVA at 95% confidence. Results showed that the 0.50 M biochar–iron composite significantly enhanced iron retention and uptake: spinach grown in composite-amended soil exhibited leaf iron concentrations rising from 110 ppm in November to 150 ppm in January aligning with FAO recommendations. **In contrast, conventional $FeCl_3$ treatment-maintained leaf iron at only 1.7–1.9 ppm throughout the three-month period,** reflecting poor soil retention and rapid leaching of $FeCl_3$. These findings highlight the composite's superior magnitude and temporal stability of iron delivery. Sugarcane bagasse biochar–iron composite thus emerges as a promising, eco-friendly alternative to synthetic iron fertilizers for improving soil fertility and crop nutrition, addressing iron deficiency in sustainable food production.

Keywords: Biochar-Iron Complex, Iron Deficiency, Spinach (Spinacia oleracea), Soil Amendment, Sustainable Agriculture

Exploring Hydroponics Farming as a Potential Supplement to Increased Food Production in Urban Settlements

Loyce Hamba
Pioneer International University - Research and Innovation Hub,
P.O. BOX 33421, Murang'a Road, Opposite K.I.C.D, Nairobi, Kenya.
loyce.hamba@students.piu.ac.ke
+254708371724

Abstract

Food insecurity remains a critical challenge in many urban settlements, particularly in informal areas where high population density, poverty, and unreliable food supply chains limit access to fresh and affordable produce. Kibera, one of Africa's largest informal settlements, exemplifies these struggles, with residents facing severe constraints in food production due to land scarcity and economic hardship. Conventional farming methods are rendered almost impossible in such an environment, necessitating alternative approaches. Hydroponics farming has emerged as a promising solution, offering a space-efficient and resource-conscious method of food production. However, its adoption in informal settlements remains limited due to financial, technical, and infrastructural barriers. This study seeks to examine the role of hydroponics farming in addressing food insecurity in Kibera by assessing its accessibility, sustainability, and impact on local food production. Specifically, the study aims to assess the extent to which hydroponics farming is accessible to urban farmers in informal settlements, identify the challenges hindering its widespread adoption, and explore possible interventions, including community training, government incentives, and NGO support, to enhance its implementation. Through a qualitative research design, the study will employ interviews with urban farmers, community members, and agricultural experts, alongside direct observations of existing hydroponics initiatives. Secondary data from reports and academic literature will further support the analysis. Preliminary findings indicate that hydroponics farming has the potential to enhance food security by enabling urban households to grow vegetables in small spaces with minimal water usage. Overall, the study aims to contribute to the discussion on urban food security by offering practical recommendations to enhance hydroponics adoption in Kibera and similar informal settlements.

Keywords: Food Security, Urban Settlement, Hydroponics Farming, Sustainability, Informal Settlement, Food Production

Cellulose-Based Superabsorbent Hydrogels Derived from Eucalyptus Leaves for Sustainable Maize Farming in Arid and Semi-Arid Regions in Kenya

Godfrey Alielo Lumula[1*], Harun Mbuvi[1], Francis Maingi[2], Prof. Justin Maghanga[3]
1 Department of Chemistry, Kenyatta University, Nairobi, Kenya
2 Department of Science Technology and Engineering, Kibabii University, Bungoma, Kenya
3 Department of Chemistry, Taita Taveta University College, Voi, Kenya

Email address: godfreylumula43@gmail.com
(+254727817606/+254794389906)

Abstract
A technology that can help in the soil water and nutrient conservation will benefit farmers. Hydrogels can absorb and hold large volumes of water and release it at required times. Most hydrogels are expensive and unfriendly to the environment. There is need to come up with hydrogels that are cheap, affordable and environmentally friendly. The objective of this study was to synthesize superabsorbent hydrogels (SAH) using cellulose treated by Fenton's reaction extracted from eucalyptus leaves and evaluate their efficiency in maize production in ASAL. In this study, the cellulose used was extracted from eucalyptus leaves using n-hexane, ethanol and deionized water as pretreatment reagents, then hydrogen peroxide and dilute sulphuric acid. This method yielded 36.1% of cellulose. Sodium chloride was added to the cellulose to improve the swelling capacity and activate it. The swelling capacity of cellulose without sodium chloride was 484.62% while the swelling capacity of cellulose treated with sodium chloride improved to 691.84%. The cellulose extracted was subjected to Fenton's reaction then cross-linked using sucrose and glycerol resulting into SAH. Hydrogels synthesized were characterized using Fourier Transform Infrared spectroscopy (FT-IR), Scanning Electron Microscopy (SEM) and X-ray Diffraction (XRD). Efficiency of the hydrogels in the maize production were determined by planting the maize in ASAL. The maize was subjected to different hydrogel dose treatments. Growth parameters were measured. Crop without SAH treatment showed symptoms of retarded growth and dried off during drought. The rest of the crop under the various SAH treatments showed increased performance with increased SAH dosage of 5g showed the best growth. Yield parameters were determined at harvesting after twelve weeks. These results are important since they show that cellulose extracted from eucalyptus leaves can be used to synthesize SAH. The results demonstrate that eucalyptus leaves are useful sources of cellulose.

Keywords: Cellulose, Synthesis, Characterization, Fenton reaction, Superabsorbent Hydrogel

Preclinical Evaluation of *Tylosema fassoglense* Root and Leaf Extracts against *Salmonella typhimurium*: Exploring Indigenous Therapies for Antimicrobial Resistance Control

Nelly Nasambu Simiyu[1], Festus Kelony[2], Morris Senghor[3]*
Kibabii University

Abstract
Typhoid fever remains a major public health challenge in low- and middle-income countries, exacerbated by rising antimicrobial resistance (AMR) in Salmonella typhi. There is an urgent need for alternative therapies to preserve existing antibiotics. *Tylosema fassoglense*, a medicinal plant traditionally used in Kenya for gastrointestinal ailments, offers potential antimicrobial properties that remain scientifically underexplored. This study aims to evaluate the antimicrobial efficacy and safety of *T. fassoglense* root and leaf extracts against *Salmonella typhimurium*, a validated murine model for typhoid-like systemic infection. An in vitro phase will assess minimum inhibitory concentration (MIC) and zones of inhibition using broth microdilution and agar diffusion assays. An in vivo phase will involve infecting BALB/c mice with *S. typhimurium* and treating them with graded doses of plant extracts. Efficacy will be evaluated based on bacterial load reduction and survival rates, while histopathological examinations of liver and gut tissues will assess safety. Data will be analyzed using descriptive statistics and one-way ANOVA, with significance set at p<0.05. Findings will provide preliminary evidence of the antimicrobial potential and safety profile of *T. fassoglense*, contributing to the scientific validation of indigenous therapies for AMR control. This study will generate foundational data to inform future research, including dose optimization and clinical trials, and supports the broader goal of integrating affordable, locally available plant-based alternatives into AMR stewardship strategies.

Determinants of Utilization of Banana Value Addition among Small-Scale Agripreneurs in Kenya: A case of Kisii County

Agnes Nyabwari Ntabo[1]*, Dickson Otieno Okello[1] and Elijah Nzula Muange[2]
[1]Department of Agricultural Economics and Agribusiness Management, Egerton University,
P.O. Box, 536, 20115, Egerton, Njoro, Kenya
[2]Department of Agricultural Sciences, Machakos University, P. O. Box, 136-90100, Machakos,
Kenya

Abstract

There is an increased demand for banana fruit and its processed products among both rural and urban populations. Value addition has the potential to reduce postharvest losses, increase crop productivity, and enhance crop income. Despite the promotion of banana value addition by government and non-governmental organizations, its utilization remains low in Kisii County, Kenya. There is a lack of information on the determinants of the utilization of banana value addition. Previous studies on determinants of crop value addition have primarily focused on tomatoes, mangoes, tubers and root crops, with limited emphasis on banana fruit. This knowledge gap necessitated the current study. A multi-stage sampling procedure was employed to select 201 respondents. Data were collected using semi-structured questionnaires and analyzed using descriptive and inferential statistics, as well as Cragg's Double Hurdle model. The results revealed that banana value adders were involved in various activities such as flour milling (36%), slicing and drying (31%), cleaning, sorting and grading (26%), and crisps making (7%). In comparison to non-value adders, value adders were significantly younger, produced larger quantities of bananas, travelled longer distances to the market, received more training and extension visits, considered farming as their main occupation, owned smaller farm sizes, and the majority did not have access to credit. The decision to utilize banana value addition was significantly influenced by the total quantity of bananas produced, the type of roads, primary occupation, the number of training sessions and extension contacts, distance to the output market, group membership, and access to credit. The extent of value addition was influenced by extension contacts, type of roads, total quantity of bananas produced, and marital status (being married). The study recommends that socioeconomic and institutional factors influencing both the decision and extent of banana value addition should be considered when formulating and implementing policies aimed at promoting banana value addition.

Keywords: Agripreneurs, banana, double hurdle, utilization, value addition.

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Factors Hindering Exclusive Breastfeeding among Lactating Mothers in Kakamega County

Wafula Elias, Dorothy Moraa, Geoffrey Magara, Lilian Walingo, Catherine Simiyu
Kibabii University
Contact: 0769181282

Abstract

Exclusive breastfeeding (EBF) during the first six months of life is a critical public health intervention that significantly reduces infant morbidity and mortality. While Kenya reports a national EBF rate of 60%, Kakamega County remains below this benchmark, with emerging evidence suggesting that multiple socio-cultural, economic, and informational factors undermine adherence to EBF guidelines. However, little is known about the specific barriers within this context, necessitating a localized investigation to guide tailored maternal and child health interventions.This study seeks to investigate the factors hindering exclusive breastfeeding among lactating mothers with infants aged 0–6 months in Kakamega County. Specifically, it will assess the influence of maternal knowledge and attitudes, explore socio-cultural norms and beliefs, and analyze socio-economic conditions affecting EBF practices. A descriptive cross-sectional study design using a mixed-methods approach will be employed. Quantitative data will be collected from 100 lactating mothers selected through systematic sampling from Maternal and Child Health (MCH) clinics and surrounding communities. Data will be gathered using semi-structured questionnaires. Qualitative data will be collected through in-depth interviews with a subset of participants to gain nuanced insights into cultural and social dynamics influencing EBF. The sample size was determined using Cochran's formula, assuming a 60% EBF prevalence rate. Quantitative data will be analyzed using SPSS version 25, applying descriptive statistics and inferential tests (chi-square and logistic regression). Qualitative data will be thematically analyzed to identify recurring patterns and contextual influences.The study anticipates identifying a range of interrelated barriers to EBF, including inadequate maternal knowledge, negative breastfeeding attitudes, lack of spousal and family support, early return to work, limited maternity protections, and persistent cultural beli/efs that promote mixed feeding. By integrating quantitative and qualitative data, the study aims to present a comprehensive understanding of the local factors that influence breastfeeding behavior.This study will provide evidence-based insights to inform locally responsive interventions, including targeted community sensitization, enhanced training for healthcare providers on lactation counseling, and advocacy for supportive workplace policies. The findings will be relevant to public health policy formulation, maternal-child health programming, and future research focused on improving EBF rates in Kenya's devolved health system, particularly in underserved regions such as Kakamega County.

Exploring the Challenges and Opportunities of Fish Farming for improved Livelihoods of local Communities in Ikolomani Sub-County, Kenya

Obino, Paul
Kibabii University

Abstract

Fish farming (aquaculture) has recently gained significant attention in Asia and Africa as a sustainable solution to meet the growing demand for fish while creating opportunities to enhance livelihoods and reduce poverty in rural communities. It is one of the fastest ways for low-income individuals to earn a living and serves as a valuable source of foreign exchange, contributing to socio-economic development. Notably, aquaculture has gradually become an essential part of rural livelihoods and is emerging as a solution to population pressures and declining wild fish catches. In Kenya, Vision 2030 aims to transform the country into a newly industrialized, middle-income nation by providing a high quality of life for all citizens by the year 2030. As part of its socio-economic development pillar, the country prioritizes investment in food security as a key strategy for improving citizens' well-being. Additionally, the County Government of Kakamega has incorporated aquaculture into its development plans to enhance rural livelihoods. Fish has long been a critical source of protein in the human diet and is increasingly recognized as a reliable means of improving local communities' living standards. However, despite these efforts, fish production and consumption remain low in the county. This study examines the impact of production costs on fish farming, the influence of market conditions on fish production, and local attitudes toward fish consumption on fish farming in Ikolomani Constituency, Kenya. A descriptive study design was used, targeting approximately 300 fish farmers in the constituency. A total of 60 fish farmers (20% of the target population) were randomly selected, while a purposive sample of 12 key informants was used in the study. Data was collected through questionnaires and in-depth interviews and analyzed using descriptive statistics and content analysis. Findings indicate that fish farmers in Ikolomani Constituency identified the high cost of fish feed and fingerlings as the most significant barrier to fish farming. While rural fish consumption remains low due to deep-rooted traditional attitudes, enhanced county government interest in fisheries and increasing demand for fish fueled by population growth particularly in urban areas within the county present opportunities for investment. The study recommends that the County Government continue raising awareness about the benefits of fish farming in enhancing food security and household incomes. Additionally, the high cost of production—driven by expensive fish feed and the limited availability of fingerlings—should be addressed to encourage greater adoption of fish farming.

Keywords: Socio-economic Factors, Fish Production

Blockchain Technology in Enhancing Food Traceability and Climate-Resilient Agricultural Value Chains

Roselida Maroko Ongare
Kibabii University
rongare@kibu.ac.ke

Abstract

Climate change presents critical challenges to agricultural systems, particularly in developing economies where food security, transparency, and sustainability are urgent concerns. This study investigates how blockchain technology can enhance food traceability and strengthen climate-resilient agricultural value chains. The objectives are to analyze how blockchain applications can improve supply chain transparency, reduce inefficiencies and post-harvest losses, and support climate-smart agricultural practices. A desktop research methodology was employed, drawing on a systematic review of existing literature, policy reports, case studies of blockchain pilot projects in sub-Saharan Africa and Asia, and secondary data from international organizations and agritech industry sources. The findings indicate that blockchain's core features; immutability, decentralization, and transparency enable real-time data sharing, provenance tracking, and smart contract implementation, offering innovative solutions to supply chain inefficiencies and fraud. Blockchain can significantly promote trust, improve decision-making, and incentivize climate-resilient behaviors among smallholder farmers. However, challenges such as digital illiteracy, infrastructure deficits, cost barriers, and regulatory uncertainty remain significant obstacles. The study concludes that for blockchain to realize its full potential in climate-smart agriculture, coordinated strategies involving supportive policies, stakeholder collaboration, and targeted digital capacity-building are essential. The paper proposes a scalable adoption framework to guide policymakers, agribusiness leaders, and development partners in integrating blockchain solutions into broader agricultural resilience strategies.

Key words: Blockchain Technology, Food Traceability, Climate-Smart Agriculture, Agricultural Value Chains, Digital Innovation, Supply Chain Transparency, Developing Economies, Post-Harvest Losses, Agricultural Sustainability

Modelling the Interactive Effects of Cattle, Goat, Poultry and Swine manure on Macronutrient Concentrations

Simon Magero*, Linda Ouma, Francis Maingi
Department of Science, Technology and Engineering, Kibabii University P.O BOX 1699-50200, Bungoma-Kenya
*Corresponding author E-mail: simonsimiyu39@gmail.com
Tel. 0715731229

Abstract

Nutrient concentration in agricultural soils is a key determinant of the soils suitability to sustain plant growth hence providing the requisite yields. Macronutrients such as nitrogen, phosphorus and potassium commonly abbreviated as NPK are the key ingredients in most inorganic fertilizers applied to improve farm yields. Animal manure could substitute inorganic fertilizers and provide the requisite nutrient profile while minimizing the environmental impact associated with inorganic fertilizers. However, studies have reported variable nutrients concentrations in manure from different animals. To improve the quality of animal manure and ensure its sustainable application for desired results this study sought to determine the macronutrient concentration of varying mixtures of manure from cattle, goat, poultry and swine. The mixing ratios were determined using response surface methodology's central composite design (CCD) to illustrate the interactive effects of the manure from the different animals on the nutrient profile of the mixture. Seven, 50g samples of each manure type were collected and oven dried at 60°C. X-ray fluorescence (XRF) was used to determine the levels of phosphorus and potassium while DUMAS method was used to determine nitrogen content. The results indicated that goat manure was richest in phosphorus and potassium, while poultry manure provided the highest nitrogen concentrations. The response surface plots indicated that while blending cattle and swine manure produced a nitrogen-rich mixture, blending goat, poultry, and swine manure gave the highest phosphorus levels. A mixture of cattle, goat, and swine manure provided an organic fertilizer that was rich in potassium. To assist farmers in the selection of animal manure and their mixing ratios depending on the desired nutrient profile, polynomial equations were generated from the CCD design. The highest nitrogen concentration was best modelled by a second-order equation while potassium and phosphorus were best modelled by third-order polynomial equations.

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Quality of vegetative seed in virus pest management: Case of Banana Bunchy Top Disease

Benard Mukoye
Kenya Plant Health Inspectorate Service
Sub-them 1: Agriculture and food security
Email: bmukoye@kephis.org
Mobile: 0712562919

Abstract

Vegetative propagation is an asexual method of plant reproduction that occurs in its leaves, roots and stem. This can occur through fragmentation and regeneration of specific vegetative parts of plants. Vegetative propagation using unclean seed often spreads plant viruses among other pathogens. Banana is mostly propagated by rhizomes and suckers. Banana bunchy top disease (BBTD) caused by Banana bunchy top virus (BBTV) is the most destructive disease limiting banana cultivation areas globally. The disease occurs in over 16 countries in Africa including Tanzania and Uganda but not yet reported in Kenya. In Tanzania, where the disease is widespread, the main cause of rapid spread has been through sharing of unclean suckers. Kenya has restricted importation of banana vegetative material from BBTD affected countries. Currently, there is increased demand for tissue culture generated suckers and the propagators have subsequently gained interest in this business. However, the standardization and adoption of virus cleaning for the tissue culture materials has not been fully adopted. This compromises on the quality of the generated banana seed which could pose a risk of pest spread. There are efforts in registration and certification of banana seed production through tissue culture. This coupled with training and awareness of the propagators will enhance quality of banana seed and support control of BBTD entry and spread. Therefore, vegetative seed quality is key in pest management. It is important to adopt and enhance regulation of vegetative seed produced locally.

Keywords: *Vegetative, propagation, certification, banana, virus*

Use of Remote Sensing (MODIS) Data and Rainfall to Estimate Forage Production in Arid Rangelands

Martha Muthoni Konje
Biological and Environmental Sciences, Department Kibabii University, Bungoma, Kenya
mkonje@kibu.ac.ke

Abstract

This study investigated the use of remote sensing data from the Moderate Resolution Imaging Spectroradiometer (MODIS) and rainfall data to estimate forage production in the arid rangelands of the Richtersveld National Park, South Africa. The research aimed to assess the spatial and temporal variability in forage production across five vegetation types and three landscape units, and to examine the relationships between the fraction of photosynthetically active radiation (fPAR), rainfall, and biomass production. Field measurements of above-ground biomass were collected during the peak growing season in 2007 and compared with corresponding MODIS fPAR data. Rainfall data were obtained from five rainfall stations located within the study area. The relationship between fPAR and field biomass measurements was examined using linear regression analysis. The relationship between rainfall and forage production was investigated using multiple linear regression analysis. The fPAR values corresponding to the dates and locations of the field measurements were extracted from the MODIS fPAR data using the "extract" function in the "raster" package (Hijmans, 2021) in R statistical software (R Core Team, 2021). The results revealed significant spatial heterogeneity in forage production, with higher biomass observed in the Central Richtersveld Mountain and Northern Richtersveld Scorpionstailveld vegetation types, and in the mountain landscape unit. Leaf and stem succulents contributed the most to the available forage, while grasses and forbs dominated in the desert vegetation types. A strong positive linear relationship was found between MODIS fPAR and field biomass measurements, indicating the potential of using remote sensing data as a reliable proxy for forage production. Rainfall emerged as a key driver of vegetation dynamics, with both fPAR and biomass showing strong positive correlations with precipitation. The study highlights the importance of understanding the spatial and temporal variability in forage resources for effective rangeland management and conservation planning in arid environments. The findings suggest that the integration of remote sensing data and rainfall records can provide valuable insights into the dynamics of arid rangelands and support the development of adaptive management strategies in the face of increasing climate variability and land use pressures.

Keywords: Biomass production, Climate change, Conservation, Pastoralists, Vegetation types

Comparative safety evaluation of palm oil from two sources using biochemical markers in wistar Rats

Nwachukwu Chukwuedozie Francis
Department of Biochemistry/ Forensic Science, Faculty of Science, Nigeria Police Academy,
Wudil Kano State.
Email: nwachukwuchukwuedozie@gmail.com or francis@polac.edu.ng
Phone number: 07064664777

Abstract

Food adulteration remains a pervasive global concern, significantly impacting food quality and safety. Palm oil, a vital component of the Nigerian diet and a rich source of nutrients, is increasingly vulnerable to adulteration due to high demand. This study investigates the potential hepatotoxic effects of palm oil from two different sources using liver function biomarkers in Wistar rats. Palm oil Source A was freshly obtained from a town (Amuzi) in Imo State, while Source B, potentially adulterated, was sourced from the Wudil market in Kano State after passing through multiple traders. Forty-eight inbred albino Wistar rats of both sexes were in seven groups (n=6)—a group I served as the control. Groups II and III received 1 mL/kg of Source A and B, respectively; Groups IV and V received 2 mL/kg; and Groups VI and VII received 3 mL/kg. Treatments were administered daily for four weeks. Liver biomarkers including aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), bilirubin (total, conjugated, and unconjugated), total protein, albumin, globulin, total cholesterol (TCHO), High-density lipoprotein (HDL), and triacylglycerol (TAG) levels were analyzed using an automated analyzer (ChemLite 180). Results revealed significant increases in liver enzymes (AST, ALT, ALP) in Groups V and VII ($p < 0.05$), suggesting hepatocellular damage. Group III also showed elevated ALT. Bilirubin levels increased significantly in Groups V and VII. Protein profile alterations were in Groups III, V, VI, and VII. Lipid profiles were also disrupted, with notable in TCHO, HDL, and TAG, particularly in Groups V and VII. In conclusion, the findings suggest that palm oil from wudil market sources may be adulterated and hepatotoxic. These results underscore the potential public health risk of consuming such oils and highlight the need for stricter food safety monitoring to curb the rising incidence of liver-related diseases.

The Future of AI in Black Soldier Fly (BSF) Farming

Austine Wandera[1] *, Collins Majengo[1]
1 Department of Agriculture and Veterinary Sciences, Kibabii University
Email: austinewandera01@gmail.com

Abstract

As the global demand for sustainable protein sources and efficient organic waste management intensifies, Black Soldier Fly (BSF) farming has emerged as a cutting- edge solution with applications in feeding poultry, aquaculture species, pigs, reptiles, amphibians, and pets. However, traditional BSF farming practices face critical limitations, including inconsistent larval development, inefficient feed conversion ratios, high labor intensity, and limited scalability. This study explores the integration of Artificial Intelligence (AI) into BSF farming as a transformative tool to address these challenges. Using a mixed-methods approach, a conceptual review complemented by observational data from pilot case studies at Hydro Victoria Africa (Budalang'i, Kenya) was conducted. The use of computer vision for real-time larval size analysis, IoT sensors for temperature and humidity regulation, and machine learning models for predicting biomass yield and mortality rates were assessed. Analytical tools used included Python-based Tensor Flow for model training and Node-RED for sensor integration. Findings from the pilot sites indicate that AI- enhanced BSF systems improved larval survival rates by 18–25%, reduced labor input by 40%, and enhanced feed-to-biomass conversion efficiency. These improvements were achieved through automated environment control, predictive maintenance, and optimized harvesting schedules. Moreover, integrating low-cost sensors improved adaptability in rural settings with limited infrastructure. However, limitations include high initial capital requirements, technical knowledge gaps among local farmers, and unreliable internet connectivity, which hampers real-time data processing in remote areas. Additional challenges include the lack of localized AI datasets and the absence of standardized regulatory frameworks for insect farming. In conclusion, AI offers transformative potential for BSF farming by enhancing productivity, reducing inefficiencies, and enabling scalable, precision-driven insect agriculture. Further empirical research is recommended to validate long-term impacts, alongside capacity- building programs to support AI adoption in rural communities and policy engagement to establish supportive regulatory environments.

Seizing Opportunity for Multi-Agenda Integration for Siaya County's Climate-Resilient Development through Legal Reforms

David WO Oremo
Acacia Community Development Group
dwodede@live.com;
WhatsApp: +254733755766

Abstract

This presentation outlines the need for establishment of the Siaya County Development Authority (SCDA) to foster climate-resilient, inclusive, and sustainable development in Siaya County, Kenya, as presented to the County Assembly of Siaya on April 16, 2025. Spearheaded by the Acacia Community Development Group (ACDG), the SCDA aims to address the county's vulnerability to climate risks, such as floods and droughts, which threaten the livelihoods of over 70% of its agriculture-dependent population. The initiative aligns with Article 42 and 43 of the Constitution of Kenya (2010), the Siaya County Climate Change Act (2021), and global frameworks like the Sustainable Development Goals and the Paris Agreement. The SCDA's core functions include mobilizing climate finance, integrating national and international climate policies, and establishing a Siaya County Data Warehouse for evidence-based decision-making. It will roll out annual socio-economic and resilience household censuses, geo-enabled risk assessments, and a people-centred multi-hazard early warning system. The authority will also coordinate governance instruments to mainstream Nationally Determined Contributions, the National Adaptation Plan, and biodiversity strategies into county planning. Potential benefits include enhanced climate resilience, green job creation, fiscal sustainability, and access to green infrastructure financing from development partners. The proposed roadmap includes a fit-for-purpose governance structure, informed by the Ouko Taskforce Report (2023) and the CBEF Report (2024), to ensure accountability and community participation. By leveraging geospatial analytics and participatory action research, as outlined in the accompanying research proposal, the SCDA seeks to bridge gaps in asset-level data and community engagement, fostering a green transition that promotes equitable prosperity and environmental justice in Siaya County.

Key Words: Siaya County Development Authority, climate resilience, sustainable development, green transition, climate finance, geospatial analytics, community participation, governance reforms, green jobs, data warehouse, multi-hazard early warning system, equitable prosperity, environmental justice.

The Role of Nyayo Tea Belt as a Buffer Zone in Sustainable Conservation of Kakamega Forest, Kenya

Vuyiya Esther[1] & Konje Martha[2]
[1] Biological Sciences Department Masinde Muliro University of Science and Technology, Kakamega, Kenya
[2] Biological and Environmental Sciences Department Kibabii University, Bugoma Kenya

Abstract
This study investigated the effectiveness of the Nyayo Tea Zone (NTZ) as a buffer zone in the conservation and management of Kakamega forest, Kenya, and assessed the impact of human activities on forest health. The research employed a mixed-methods approach, combining questionnaires administered to 339 randomly selected households within 5km of the NTZ boundary, structured interviews with key stakeholders, and experimental vegetation sampling. Four study sites were selected: Handidi, Lukusi, and Isecheno (adjacent to NTZ) and a Kenya Wildlife Service (KWS) site as control. Vegetation sampling used belt transects to assess tree species diversity, richness, canopy surface area, and seedling density. Qualitative data from questionnaires and interviews were analyzed by use of descriptive and inferential statistics with the help of the Statistical Package for Social Sciences (SPSS version 17.0). Quantitative data from vegetation sampling were analyzed by two-way analysis of variance (ANOVA) to test any significant differences. Correlation analysis was also done between dependent ad independent variables. Results revealed that only 22.19% of the cleared forest land was utilized for tea plantation, while 59.02% was allocated to exotic forest species. All study sites adjacent to NTZ showed significantly lower species diversity, richness, canopy surface area, and seedling density compared to the KWS control site. Human activities (logging, grazing, debarking, and charcoal burning) demonstrated significant negative correlations with forest health indicators. Furthermore, 80% of respondents reported continued forest access despite the NTZ's presence, with only 2.5% recognizing its role as a conservation barrier. The study concludes that the NTZ buffer zone has not effectively achieved its conservation objectives, highlighting the need for more integrated approaches to forest protection and community engagement.

Keywords: Biodiversity, encroachment, indigenous forests, land use, protected areas

Initiatives for Enhancing Motorcycle Taxi Drivers' Road Safety Behaviour within Bungoma South Sub-County, Bungoma County, Kenya

Janet Nabiswa[1], Ferdinand Nabiswa[2]
[1]Kibabii University; [2]Masinde Muliro University of Science and Technology
Corresponding Author's email: jnabiswa@kibu.ac.ke
Contact: 0718826834
Co-author's email: fnabiswa@mmust.ac.ke
Contact: 0710414943

Abstract

Motorcycle taxi industry forms an integral part of Kenya's public transport system. Motorcycle taxi drivers (*boda-boda* riders) play a critical role, serving even the most remote and inaccessible rural regions of the Country, yet they operate in a manner that often undervalues their contribution. This has created a high-pressure environment which if continuously ignored or poorly managed, may interfere with most drivers' mental stability on the road. This indicates a critical need for psychosocial support to help drivers manage stress and avoid risky behavior caused by mental strain. The study sought to investigate challenges faced and initiatives being deployed towards road safety behaviour among boda-boda riders in Bungoma South Sub-County, Bungoma County, Kenya. A sample of 134 boda-boda riders was selected out of the target population of 450 regular *boda-boda* riders in the sampled study area. Descriptive survey design was used while the research instruments employed were questionnaires, interview guides and observation checklists. Descriptive statistics by way of frequencies and pie charts were used in data analysis. The study established that *boda-boda* riders still face a myriad of both economic and psychosocial challenges summarized as follows: 50.7% cited lack of formal training on road safety; 35.1% cited financial stress; 35% cited harassment from law enforcers; 49.3% cited discrimination, while 85.1% cited peer pressure for engaging in risky behaviour. Despite the challenges, 34.3% of the *boda-boda* riders expressed commitment to this occupation viewing it as a career rather than a temporary hustle and should therefore be capacity build to handle psychological related pressures that topped their list of challenges. Given the level of unemployment and evident positive attitude among *boda-boda* riders, authors opine that the motorcycle taxi industry is economically viable yet psycho-socially vulnerable. The study provides practical recommendations to improve road safety behaviour within the motorcycle taxi industry in Kenya.

Keywords: boda-boda riders, challenges, opportunities, initiatives, road safety behaviour.

Effect of Duty to Care on the Job Performance of the National Police Service Officers in Kakamega County, Kenya

Khalayi N. Eddah, Department of Business Administration, Kibabii University
naliakaedda@gmail.com +254799435635

Fred Gichana Atandi , Department of Business Administration, Kibabii University,
fgatandi@kibu.ac.ke +254710276503

Abstract

Performance of individual employees contributes to an organization's overall performance, which begins at the root where character affects the overall organization output. This study examines the effect of duty to care on the job performance of the National Police Service officers. Data was collected from 331 officers from the National Police Service Officers in Kakamega County, Kenya. Data was analyzed using the SPSS (Statistical Package for Social Scientists). The results showed that duty to care had a weak and non-significant correlation with job performance. The regression results indicated that officers' sense of duty to care does not significantly contribute to variations in their job performance. This suggests that while officers may feel responsible for their communities, it does not directly translate into improved job performance. Police leadership should encourage ethical and responsible service delivery while linking it to tangible performance metrics to enhance job effectiveness.

Key words: Duty to Care, Police Officers, County Government, National Police Service, Performance.

A study on The Prevalence and Types of Alcohol and Drug Use among Kaimosi Friends University Students

Anne Asiko Okanga[1]
[1]Department of Nursing, School of Health Sciences, Kaimosi Friends University
aasiko@kafu.ac.ke asikokanga@yahoo.com
Tel; +254721582788

Abstract

Drug and substance abuse poses a serious threat to health, education, and social well-being in Kenya, with Vihiga County being particularly vulnerable due to the widespread availability of cheap, unregulated substances. The growing use of drugs among adolescents, often linked to school dropout, criminal activities, and risky sexual behavior, calls for urgent and targeted intervention. This study examined the prevalence, types, and patterns of alcohol and drug use among students at Kaimosi Friends University (KAFU), as well as their awareness and knowledge of substance abuse. A descriptive cross-sectional research design was employed, with a stratified random sample of 350 students selected from a population of 4,800. Data collection was done using structured questionnaires adapted from NACADA in May 2025, and the analysis involved descriptive statistics using SPSS. Ethical clearance was granted by MMUST, with participant confidentiality and voluntary participation ensured. Findings revealed that 65.1% of respondents were male, with an average age of 21.8 years. Most were government-sponsored (76%), and the largest proportion (68%) came from the School of Education and Social Sciences. A majority (57%) lived off-campus, mainly in Cheptulu (28%) and Jivuye (16%). Lifetime substance use stood at 70%, and 60% had used substances in the past year. Alcohol was the most commonly used substance (70%), followed by cigarettes (50%) and marijuana (40%). Other substances like codeine, prescription drugs, shisha, miraa, and vape products had usage rates between 20–30%, while fewer than 10% reported using hard drugs such as heroin and cocaine. Most students began using substances between the ages of 15–19, with accessibility playing a significant role—especially for alcohol, cigarettes, and miraa. The study concludes that substance use among university students is alarmingly high and recommends increased awareness programs, improved on-campus support services, and stronger regulation of substance availability in surrounding communities.

Keywords: Substance abuse, university students, drug accessibility

Measuring the Effect of Different Modes of Mobile Phone-Based Antenatal Family Planning Counselling on the Intention for Early Postpartum Family Planning Uptake in Western Kenya: A Pragmatic Factorial Randomized Control Trial

Morris Senghor Shisanya[1], Mary Kipmerewo[2a], Everlyne Morema[2b], Collins Ouma[3]
[1.] Email. mshisanya@kibu.ac.ke, senghormorris@gmail.com Phone: +254 720 640 142, P.O. Box 1699-50200, Bungoma, Kenya
[2a.] Email. mkipmerewo@mmust.ac.ke, kipmerewosoi@yahoo.com Phone: +254 722 797 865, P.O Box 190-50100, Kakamega, Kenya
[2b.] Email: emorema@mmust.ac.ke , evenyanchera@yahoo.com Phone +254 721 262 748, P.O Box 190-50100, Kakamega
[4.] Email: couma@maseno.ac.ke , collinouma@yahoo.com Phone +254 722 381 214, P.O. Box, Private Bag, Maseno, Kenya
[1]Department of Community Health Nursing, School of Nursing, Kibabii University, Bungoma, Kenya
[2]Department of Reproductive Health, Midwifery and Child Health, SONMAPS, Masinde Muliro University of Science and Technology (MMUST), Kakamega, Kenya
[3]Department of Biomedical Sciences and Technology, Maseno University, Maseno, Kenya

Abstract

Integrating postpartum family planning (PPFP) within the maternal and child health care continuum—especially during the antenatal period—offers a critical opportunity to influence uptake. With the widespread use of mobile technology, digital counselling tools can strengthen antenatal interventions, particularly in resource-limited settings. To assess the effect of mobile phone-based antenatal family planning counselling delivered by nurses and community health workers (CHWs) on intention for early PPFP uptake among postpartum mothers in Kisumu County, Western Kenya. A pragmatic factorial randomized controlled trial was conducted with postpartum women randomized into three arms: counselling by nurses using mobile phones, counselling by CHWs using mobile phones, and routine care (control). Intention for early PPFP was measured using a 7-point Likert scale. Data were analyzed using ANOVA, ordinal regression, and Tukey's post hoc test, with significance set at $P < 0.05$. Effect sizes were assessed using partial eta^2. The nurses' arm had the highest mean intention score (6.59 ± 0.87), followed by the community arm (6.05 ± 0.86) and the control (6.03 ± 0.69). ANOVA revealed significant differences between the arms ($F(2,243)=12.43$, $P<0.0001$). Tukey's test showed that the nurses' arm was significantly superior to both the community and control arms ($P<0.0001$), with a medium effect size (partial $eta^2 = 0.06$ to <0.14). Combined intervention arms also showed significantly higher intention than the control ($P=0.012$; small effect size: partial $eta^2 = 0.026$). There was no significant difference between the community and control arms ($P=0.986$). Mobile phone-based antenatal family planning counselling delivered by nurses significantly enhances intention for early PPFP uptake. Empowering nurses with mobile counselling tools could strengthen PPFP interventions and reduce unmet contraceptive needs during the postpartum period.

Occupational Health and Safety and Employee Performance in Sugar Manufacturing Industries in Western Kenya

[1] Sylvia Bisela Simiyu & [2]Fred Atandi
sylviasimiyu79@gmail.com; fgatandi@kibu.ac.ke
Kibabii University

Abstract

The Occupational Safety and Health Act No. 15 of 2007 and reread in 2010, offers for the safety health and benefit of personnel and all individuals lawfully current at places of employment in Kenya. Despite this workers have continued to face occupational health and safety challenges which expose them to a wide range of accidents which eventually pull down their performance. According to ILO statistics on safety and health at work of 28th April 2016, 6300 individuals succumb daily due to occupational accidents or employment associated ailments and deaths exceeding 2.3 million yearly. The study was purposed to investigate the effect of occupational health and safety (OHS) on employee performance in Sugar Industries in Western Kenya. The explicit objective was to determine the effects of working culture on employee performance in sugar industries in Western Kenya. The target population Comprised 8801 staff in all the sugar firms in Western Kenya. Stratified random sampling technique was used to select a sample of 383. Primary data was gathered by use of questions which were validated through a pilot study of 10 staff prior to the main research. Cronbach alpha coefficient with a threshold of 0.70 was used to test the reliability of the research instrument. The study findings revealed that: working culture contributed to employee performance $\beta=0.532$. The R2 change after incorporating Top Management Support was 0.290, P=0.000 implying that TMS statistically moderates the relationship between occupational health and safety and employee performance. Study concluded that: Working culture has a significant effect on employee performance while TMS has a significant moderator and influences the relationship between OHS and employee performance.

Keywords: Occupational health, employee performance, working culture, sugar manufacturing industries in Kenya.

Harnessing storytelling and community radio for transformative learning for grassroots development in Kenya

Isabel Ziz
Kibabii University,
Email: izattu@kibu.com, Contact: 0720530549

Peter Day
University of Brighton
peterday1954@outlook.com

Jerry Agalo
Rongo Uiversity
jakondele@yahoo.com

Abstract

Drawing on the experiences of a research project funded by the UK's Arts and Humanities Research Council (AHRC) and the Global Challenges Research Fund (GCRF), this study, which formed part of the Anti-slavery Knowledge Network (AKN) programme, explores how the often-underestimated power of storytelling techniques can be harnessed to improve information flow in grassroots communities through community radio. Using Community Media 4 Kenya's (CM4K) project as a case study, the research aimed to (1) assess how storytelling enhances participatory communication in marginalized communities, whilst (2) exploring ways in which community radio can reach its full potential when communities are empowered with media skills. The methodology employed Community Media-based Participatory Research (CMbPR) approach, incorporating storytelling workshops, scenario-based learning, and capacity-building sessions. Participants were equipped with practical skills in audio recording, interviewing, and content creation, guided by theories of transformative learning and multiple intelligences. The project revealed that when communities were trained in storytelling and equipped with basic media tools, they become more confident and active in sharing lived experiences. In Cham gi Wadu, this approach enabled community members to co-create radio content addressing critical issues like child labor and early marriage. Through collaborative dialogue and knowledge sharing, participants not only crafted meaningful stories but also built a sense of ownership and agency over the planned community radio station. The storytelling process itself became a vehicle for critical consciousness and collective problem-solving, aligned with Sustainable Development Goals (SDGs), particularly Target 8.7. The research concluded that good storytelling is more than a communication tool—it can also be a catalyst for social change, especially in marginalized communities. The CM4K model demonstrates that empowering communities with storytelling and media production skills can bridge the information gap and foster development communication from the ground up. Community radio, when anchored in local narratives and participation, becomes a transformative platform that informs, connects, and empowers. These insights highlight the need for academia and policy frameworks to invest in community-driven media as a sustainable development strategy.

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SUB-THEME #2
HEALTH AND WELL-BEING

Mental Health and Realization of Sustainable Development Goals among Catholic Religious Men and Women and Catholic Diocesan Priests in Kenya

Jacklyne Okello Alari, PhD
Kibabii University, P. O. Box 1699 -50200 Bungoma, Kenya
jalari@kibu.ac.ke or jackalari@gmail.com, +254 727 527 746
and
Lucy Namusonge, PhD
Kibabii University, P. O. Box 1699 -50200 Bungoma, Kenya
nnamusonge@kibu.ac.ke or lucy.namusonge@gmail.com, +254 708798756

Introduction: The Sustainable Development Goals (SDGs) emphasize health and well-being (SDG 3) as central to sustainable development. Mental health is a critical component of overall well-being, yet it is often overlooked in public health discussions. Mental disorders, including stress, anxiety, and depression, significantly affect individuals' productivity and social engagement. In Kenya, mental health studies remain inadequate, particularly concerning Catholic religious and priests, who play an integral role in the realization of SDGs through their community and spiritual work. This study examines stress levels and predisposing factors among Catholic religious and priests in Kenya and their impact on their ability to contribute to the SDGs.

Objectives: To determine the mental ill health predisposing factors affecting Catholic religious and priests; To evaluate the impact of mental health challenges on their role in implementing SDGs; To propose strategies to enhance mental well-being among Catholic religious and priests.

Hypothesis: Higher levels of stress and mental distress among Catholic religious men and women and Catholic diocesan priests negatively affect their ability to contribute effectively to the realization of SDGs in Kenya.

Methodology: A mixed-methods research approach was used, incorporating both qualitative and quantitative data collection. A survey targeting Catholic religious Catholic religious men and women and Catholic diocesan priests across Kenya was conducted using an online structured questionnaire. The questionnaire included both open-ended and closed-ended questions, with a three-point Likert scale format for assessing stress levels and mental health challenges. Data were collected from March to May 2023, and analysis was performed using qualitative interpretive descriptive methods supported by direct quotations and statistical validation.

Results: The study found that a significant proportion of Catholic religious men and women and Catholic diocesan experience high levels of stress, primarily due to workload, lack of mental health support, societal expectations, unresolved personal and community matters, a poor support system, overworking, high expectations/pressure from other people, being loaded with many responsibilities, situations of conflicts, and loneliness. Key predisposing factors included long working hours, isolation, and inadequate access to professional psychological services. The findings indicate that mental health challenges negatively affect the quality of life of religious and priests, impacting their efficiency in community service and SDG implementation.

Conclusions: Mental health remains a crucial but neglected issue among Catholic religious men and women and Catholic diocesan priests. Addressing these challenges is essential for their well-being and their ability to contribute effectively to sustainable development. Institutions must

prioritize psychological counseling, stress management training, and awareness programs to reduce stigma around mental health.

Recommendations: The Catholic Church and affiliated organizations should invest in mental health training for clergy members, including psychology practitioners and spiritual directors. Adoption of the Identification, Communication, Referral, Intervention, and Follow-up (ICRIF) framework to support mental health management. Strengthening collaboration between religious institutions and mental health professionals to offer specialized counseling and support services. Promoting mental health awareness and self-care strategies within religious communities to foster resilience and sustainability in their work.

This study highlights the need for structured mental health interventions within religious institutions to enhance the well-being of Catholic religious men and women and Catholic diocesan priests and, by extension, their contributions to sustainable development in Kenya.

Keywords: Catholic Religious Men and Women, Health, Mental health, Catholic Diocesan Priests, Well-being

Determinants of Malaria in under 5 Children in Yala

Patrick Siebela, Redemter Kanyiva, Christopher Mumo, Phanice Mutoro
yalakibu@gmail.com
0714060673

Abstract

Malaria remains a significant public health challenge particularly in Sub Saharan Africa, affecting children under five years who are vulnerable to the disease. This research proposal aims to investigate the risk factors of malaria in Yala, a rural community in Kenya. Preliminary findings indicate a high incidence of malaria in Yala with a particularly high burden in children under five. This study adopted mixed methods approach combining quantitative surveys and qualitative interviews to provide a comprehensive understanding of malaria dynamics in a community. The quantitative component involved a cross-sectional survey of 100 households to assess the association between demographic, behavioral and environmental factors to malaria transmission and the use of preventive measures such as insecticide treated nets and conducting educational programs to raise awareness transmission targeting both care givers and broader community. The findings showed that demographic factors such as age of the child and occupation of the caregiver had an influence child malaria diagnosis. The qualitative component involved key informant interviews and focused group discussions with community members ,health providers and local leaders .This discussion explored community knowledge and practices related to malaria prevention and treatment , preliminary findings revealed that despite high ITN coverage, the incidence of malaria remain elevated due to factors such as improper use of nets , insecticide resistance and environmental conditions favoring mosquito breeding .This research provided critical insights into behavioral and environmental factors contributing to malaria persistence in Yala. The findings informed the design and implementation of targeted interventions to reduce malaria transmission, improve engagement in malaria control activities and effectiveness of existing prevention strategies. Ultimately, this study aimed to contribute to broader goal of malaria elimination in Kenya by providing evidence based recommendations for policy maker and health care practitioners

Telemedicine and AI in Healthcare Delivery: A Review

[1]Salihu A.K, [2]Sani, M.S, [1]Farooq M. A, [3]Attahir I, [4]Adamu AM [4]Sabo A, [5]Olokoba O. E, [1]Y. Ahmad, [1]Alhassa Abdulrahi Galadi, [6]Jibril. A.D,

1 Department of Nursing Science, Faculty of Allied Health Sciences, Ahmadu Bello University Zaria, Nigeria
2 Nursing Science Program, Distance Learning Center, Ahmadu Bello University Zaria, Nigeria
3 Department of Nursing Science, Kaduna State University, Nigeria
4 Department of Nursing Science, Federal University of Health Sciences, Azare, Nigeria
5 Department of Nursing Science, National Open University of Nigeria, Nigeria.
6 College of Nursing Sciences, Niger State Nigeria
Corresponding Author_aksalihu@abu.edu.ng
[1]Salihu A.K aksalihu@abu.edu.ng, [2]Sani, M.S _ saneeshat4life@gmail.com, [1]Farooq M. A _farooooq2013@gmail.com, [3]Attahir I_ ibrahim.attahir@kasu.edu.ng, [4]Adamu A, adamu.alhaji@fuhsa.edu.ng, [4]Sabo A_ Adamu.sabo@fuhsa.edu.ng, [5]Olokoba O. E_ oolokoba@noun.edu.ng [1]Y. Ahmad_ yunusahmad8078@gmail.com, [1]Alhassa Abdulrahi Galadi_ abdraheem423@gmail.com,
[6]Jibril. A.D_ jdzwafu@gmail.com,

Abstract

This study addresses the utilization of artificial intelligence (AI) in telemedicine, its potential for enhanced accessibility, efficacy, and outcomes for patients, and its utilization for addressing healthcare disparities, with a primary emphasis on underserved and rural populations. A systematic review of the more recent literature has been undertaken for evaluating the use of AI in telemedicine. The main areas of research are improvements in diagnosis, predictive analytics, personalized treatment plans, and systems for monitoring patients. Research on evaluating data security, regulatory requirements, and technical limitations has also been considered. Findings confirmed that telemedicine use with AI significantly improves healthcare provision with real-time decision-support, accuracy of diagnoses, and continuous observation of patients with wearables. The utilization of telehealth systems with artificial intelligence minimizes hospital visits, improves chronic disease treatment, and raises satisfaction for patients. But legal barriers, ethical considerations, interoperability, and lack of digital skills hinder adoption. The future of artificial intelligence in telemedicine remains bright, with advancements in 5G and virtual reality expected to continue simplifying healthcare provision. Investment for sustainability, stringent regulations, and more collaborative stakeholder action are necessary if today's challenges are to be overcome. Proper adoption of artificial intelligence in telemedicine can bridge gaps in healthcare, improve patient outcomes, and drive innovations in digital healthcare.

Keywords: *Telemedicine, Artificial Intelligence (AI), Healthcare Delivery, Accessibility, Patient Outcomes*

Prevalence of *Ascaris Lumbricoides* Infections in Relation to Malnutrition and Risk Factors among Children Attending Kapsowar Hospital

Jumbe Masafu
Email-jumbemasafu@gmail.com cc.sang'aloist@hoo.com,
The Bungoma National Polytechnic, Kibabii University
0723277148

Abstract

AscarisLumbricoides is a species of roundworm in phylum Nematoda, class Chromadorea and order Ascaridida.Roundworms are parasitic worms. AscarisLumbricoides causes Ascariasis which is the most common roundworm infection. About 10% of the developing world is infected with the intestinal worms according to the World Health Organization (WHO). The objective was to assess the prevalence of *AscarisLumbricoides* infections and examine its association with malnutrition and related risk factors among children attending Kapsowar hospital. Research Question; Is there a significant association between Ascaris lumbricoides infection and malnutrition among children attending kapsowar Hospital? Hypothesis: Children infected with Ascaris lumbricoides are more likely to be malnourished compared to non-infected children. *Ascaris Lumbricoides* is probably the most prevalent human intestinal helminth, previous estimates of world prevalence range from around 550 million to 1100million; David Crompton confirms a higher estimate of the world prevalence of 1150 million representing about 22% of world's population. Ascariasis is more prevalent in tropical and sub -tropical areas, in Kenya children are at a high risk of ascariasis despite some periodic administration of anthelminthic in some parts of the country. A review of field studies published since 1975 indicates that *Ascaris Lumbricoides* infections retards childhood growth, in these studies a better nutritional status in terms of growth, lactose tolerance, vitamins A & C and albumin levels were observed among Ascaris free/treated than in Ascaris infected/untreated children. Medical records as per the end of the year 2019 in Kapsowar Hospital showed that 1600 children had attended the hospital for medical care, 8.9375% were diagnosed of *AscarisLumbricoides* infections and 2.3125% were found to be malnourished. The purpose of the study was to determine the prevalence and the relationship between ascariasis and its effects on child growth among children in Kapsowar region, 100 hospital records were retrospectively analyzed to obtain the relevant information. BMI againt the age and weight against height were used to determine malnuitrition levels.Data collected was analysed using spss software .Inclusion criteria, Malnuitritioned children infected with Ascaris Lumbricoides. Exclusion criteria, Malnuitritioned Adults infected with Ascaris Lumbricoides. The findings of this study were made available for the public health sector to identify and plan for possible ways to mitigate the threat that endangers the young lives of children where some have even died and did not live up to full age as a result of ascariasis and the associated consequences and which for a long time has been neglected. The findings suggest a notable prevalence of Ascaris lumbricoides among children in kapsowar region,with potential implications for nutritional status and child health. The health sector to roll out deworming programs, improve sanitation and hygiene education, organize Nuitritional support and monitoring programs in affected regions.

Keywords: Prevalence, Ascaris, Malnutrition, children

Prevalence, Risk Factors, and Management of Substance Abuse among Students at Kenya Medical Training College

Varelian Gicuku Anyira
School of Nursing and Midwifery, Kibabii University
Email-vanyira@kibu.ac.ke / 0799848221

Abstract

Substance abuse among youths remains a pressing concern in Kenya with psychoactive substances such as alcohol, tobacco and stimulants contributing to negative health and academic outcomes. According to NACADA survey, 16.9% had used at least one psychoactive substance. Despite the alarming statistics, the training institutions lacks effective prevention and management frameworks. This study investigated the prevalence, associated risk factors, effects on academic performance and management strategies related to substance use among students at Kenya Medical Training College (KMTC). The study idea was prompted by informal observations, practical problems such as absenteeism, examination malpractices and existing research. A descriptive cross-sectional study design utilizing both qualitative and quantitative approaches was adopted. A multistage and simple random sampling method was used to select 426 students across 14 KMTC Campuses. Qualitative data collection was done through structured questionnaires and interview guide used to collect quantitative data. Out of these 353 fully completed questionnaires were analysis using content analysis for qualitative data and statistical software for quantitative data. The most commonly used substances were alcohol (27.5%, n=97), tobacco products (24%, n=84), cocaine (8.5%, n=30), and hallucinogen (8.2%, n=29). Significant risk factors included gender, income, and peer influence (p>0.0001). Academic consequences associated with substance use included declining grades (43.3%, n=153), strained relationships, bullying, theft, and exam malpractice. Substance abuse is prevalent among KMTC students, with significant associations found between substance use and academic challenges, peer influence, and socioeconomic status. Management strategies remain largely punitive with limited support or rehabilitation options. Comprehensive, evidence- based interventions targeting these risk factors are urgently needed. Multilevel school-based interventions; an approach that emphasizes the importance of both teacher and school level support for sustained behavioral change. Harm reduction education; safety first curriculum that adopts a harm reduction approach, provides factual information and non-judgmental strategies to manage substance use risks. Students appreciate the interactive and engaging activities which enhances understanding and decision-making skills. Evidence based curricula; programs like life skills training (LST) and communities that care (CTC) focuses on personal development, social skills and community engagement. It has demonstrated success in reducing substance use among students, while CTC emphasize community wide prevention strategies. Targeted interventions for At-Risk students; targets students at risk of academic failure, focusing on cognitive-behavioral skills and social competencies. Studies suggests that it effectively reduce substance use and improvement in personal and social skills.

Adolescents and Parents: Navigating Ethical Dilemmas in the Relationship Dynamic for Mental Health

Leunita M. Makila
Kibabii University

Abstract

The quality of family relationships can have a significant impact on an individuals mental. Family involvement is an important ethical consideration to make when developing mental health interventions for adolescents (Memon *et,el*.,2021). Teenage years are crucial to the development of our relationships over time, marked by a growing struggle of independence and choice. Parents typically play a central role during childhood and are the primary caregivers. During the transition from childhood to adolescence, individuals eventually seek a higher degree of autonomy to establish a greater sense of control in their lives. Parenting styles are significantly influenced by culture, especially in the Global South. As teenagers begin to develop relationships of their own, they are exposed to different beliefs, often contradictory to their own. This mental conflict can provoke emotions of anxiety, frustration, and confusion. With a generation gap at play, some parents in collectivist societies are fixated on shaping their kids into the best version of their past experiences and elevated expectations. This conflict instigates feelings of cognitive dissonance and can potentially be detrimental to the parent-teen relationship (DeVille *et el*.,2020). However, these ethical disagreements can be moderated through healthy discussions between parents and their children to appreciate opposing perspectives (Kang *et el*.,2017). This paper seeks to discuss the ethical framework in Building Family Bonds.

Assessment of Risk Factors Associated with Human Papilloma-virus Infection among Women of Reproductive Age Attending Selected Hospitals in Kilifi County, Kenya: A Study Protocol

Jane Kabo
School of Nursing, Kibabii University
Email: jwamuyu@kibu.ac.ke , Phone: +254 722591518

Abstract

Globally, cervical cancer is the second most common cancer in women, with an estimated 660,000 new cases and 350,000 deaths in 2022 as per WHO. The Low and Middle-Income countries including Kenya bear the biggest burden. The cancer is rated second most common among Kenyan women, accounting for 19.7% of all gynecological cancers. The Global Cancer Observatory 2020 data estimates 5,236 new cases and 3,211 deaths annually for Kenya. Moreover, it is the second most frequent cancer among women between 15 and 44 years of age. The majority of cervical cancer cases are caused by the Human Papilloma Virus (HPV) infection, accounting for about 99.7% as per WHO 2022 data, among other factors. The study aims to determine the burden and risk factors for HPV infection among women 30 to 49 years, attending selected facilities in Kilifi County, Kenya using HPV DNA self-sampling method. This study will utilize a descriptive cross sectional design. The target population will be women aged 30 to 49 years, who will meet the eligibility criteria for HPV DNA self-test as aligned with the National Cervical Cancer Screening Guidelines and World Health Organization (WHO) recommendations. A sample size of 321 women will be selected using systematic random sampling method and hospitals chosen conveniently depending on the numbers of clients as per Kilifi Demographic Health Statistics. Ethical approval will be sought from the relevant authorities. Self/researcher-administered questionnaires and HPV DNA molecular (self-sampling) test will be carried out for every woman who consent to the study. Data analysis for both descriptive and inferential statistics will be done using SPSS V25. Descriptive statistics will be employed for prevalence and demographic characteristics. Bivariate and multivariate analysis will be utilized to determine factors associated with HPV infection. P-value will be set at < 0.05 with a confidence interval of 95%. The results of this study will be used as a basis for developing targeted reproductive health interventions such as health education and resource allocation towards HPV infection prevention. This will also build on the current cervical disease control policy guidelines, while adding to existing literature and nursing research on the risk factors for HPV infection among this population and comparable settings.

Key words: Cervical cancer, Reproductive age, Risk factors, Screening, Human Papilloma-virus

Birth Preparedness and Complication Readiness among Pregnant Women at Kakamega County General and Referral Hospital: A Mixed Methods Study

Mercy Kisorio, Babu Onyango, Grace Wangoi, Emmanuel Odali, Catherine Simiyu
Kibabii University
emmanuelodali01@gmail.com
0707519485

Abstract

Maternal mortality remains a public health concern in Kenya, with a maternal mortality ratio of 355 per 100,000 live births (KDHS, 2022). Despite high antenatal care (ANC) attendance, a significant proportion of women remain inadequately prepared for birth and obstetric emergencies. Birth preparedness and complication readiness (BPCR) are recognized strategies for mitigating maternal and neonatal risks. However, evidence from Kakamega County on the status and influencing factors of BPCR is limited. This study aims to assess the level of BPCR among pregnant women attending ANC at Kakamega County General and Referral Hospital, identify sociodemographic, obstetric, and knowledge-based determinants, and recommend strategies to enhance preparedness. A cross-sectional mixed-methods design will be employed. Quantitative data will be collected from 422 pregnant women (≥28 weeks gestation) using structured questionnaires adapted from JHPIEGO's Safe Motherhood tools. Systematic random sampling will ensure representativeness. Qualitative data will be gathered from 12–15 purposively selected participants using semi-structured interviews. Quantitative data will be analyzed using SPSS v26 with descriptive and inferential statistics (chi-square, logistic regression), while qualitative data will be thematically analyzed. Data sources include primary structured surveys and recorded in-depth interviews. Analytical techniques will allow triangulation of quantitative patterns with qualitative insights, enhancing the depth and applicability of findings. It is anticipated that a considerable proportion of pregnant women will demonstrate suboptimal BPCR. Key influencing factors are expected to include ANC attendance, education, income, parity, and knowledge of obstetric danger signs. Findings will inform maternal health policy, support targeted ANC interventions, and contribute to reducing delays in care-seeking and emergency response.

Keywords: Birth preparedness, complication readiness, maternal health, mixed methods, Kakamega County, antenatal care

The Hidden Power of Nutrition in Safeguarding Prostate Health: A Review

Nwachukwu Francis Chukwuedozie
Department of Biochemistry, Nigeria Police Academy
tilong3788@yahoo.com
+237064664777

Abstract

Prostate cancer is a concern for men due to the rising rates and mortality globally from it. Though not essential for life, the prostate plays vital roles in reproduction, urination, and hormone regulation. Many modifiable risk factors also contribute to prostate cancer development, including lifestyle, poor diet (low in fruits and vegetables), processed foods, and certain infections. Testosterone, the primary male hormone, plays a key role in prostate growth and can contribute to cancer development under certain conditions. Despite advancements in diagnostics and treatment, there is a growing emphasis on dietary prevention to reduce disease burden. A literature search was on key phrases: nutrition and prostate health, dietary measures in prostate health, advances in prostate health management, and herbals and prostate health on six major academic databases: Scopus, Web of Science, PubMed, ScienceDirect, Directory of Open Access Journals (DOAJ), and JSTOR. Of the Initial two hundred sixty-one articles selected, two hundred twenty-one were available and downloaded. A total of 32 of the downloaded articles were screened out based on inconsistencies, conflicting information, and other issues. The remaining articles (189) progressed for use in this review. This review highlights evidence linking plant-based diets, antioxidants, phytochemicals (lycopene, isoflavones, catechins), and micronutrients like selenium and zinc to reduced prostate cancer risk. These dietary components influence key biological pathways such as inflammation, oxidative stress, and hormone regulation. Conversely, diets high in red and processed meats, unhealthy fats, and alcohol are associated with increased cancer risk. In this context, nutrition is a powerful yet underutilized preventive tool. Given this, the review calls for a shift in public health strategy by promoting nutrition-based interventions and education. Integrating dietary guidance into clinical and community health frameworks can empower men to take proactive steps toward safeguarding prostate health and reducing the risk of cancer through informed food choices.

Predictors of Weight Status among Under-Fives in Kondele Ward

Austin Onyango, Tracy Chepkemoi, Sarah Moindi, Mercy Chepngetich, Morris S. Senghor
Kibabii University

Abstract

Weight status in children under five is a vital marker of health, growth, and development. In urban informal settlements like Kondele Ward in Kisumu County, child nutritional outcomes are influenced by a complex interplay of feeding practices, maternal health behaviors, and access to healthcare services. Understanding these factors is essential for designing context-specific interventions in low-resource urban settings. To identify key predictors of weight status among children under five years in Kondele Ward, with a focus on feeding practices, maternal health behaviors, and access to maternal and child healthcare. This cross-sectional study will employ a mixed-methods approach. Quantitative data will be collected from mothers or caregivers of under-five children using structured questionnaires, while qualitative data will be gathered through focus group discussions and key informant interviews. Quantitative analysis will include descriptive statistics and logistic regression to identify significant predictors of weight status. Qualitative data will be analyzed thematically to enrich understanding of caregiving and feeding practices. The study is expected to identify modifiable predictors of undernutrition and unhealthy weight patterns among children under five in Kondele, particularly highlighting the role of maternal knowledge, feeding behaviors, and healthcare access. Findings from this study will inform the design of targeted, evidence-based interventions aimed at improving child nutrition, promoting healthy caregiving practices, and supporting early childhood development in vulnerable urban communities.

The Role of Online Comedy in Tackling Issues related to Mental Health among Kenyans

Magambo Emilly Angushi, Simiyu Fred Wanjala and Orina Felix Ayioka
Kibabii University
emilymagambo77@gmail.com,
0722696370

Abstract
Art in its various realization and genres from time immemorial has had distinct social roles to play. Joke performance as one of the oral literature genres, has been used at large through media such as television and radio to entertain viewers and listeners. But in the recent times it has taken a different way of presentation. This is because of the numerous ways of communication such as *Facebook, Twitter, Tik Tok, Instagram and You Tube* as a result of the new technology. Nowadays we have many ways of communication than ever before because of the new technology. Besides this new evolution of ways of communication, let us not forget that comedy has been of great importance to our society and it has been used to tackle many emerging issues that affect the society in Kenya. So there was a greater need to do research concerning online comedy and mental health among Kenyans, this is because mental health has become such a big issue in our country. The purpose of this study was to show the role of online comedy and how it can be used to tackle issues related to mental health. This research topic was picked because those who researched on comedy dwelled on literature books, that is, novels and plays. This research therefore aimed at filling the gap by studying online comedy and mental health among Kenyans. The study was guided by humour theory of Sigmund Freud which states that the main objective of humour is to make people happy. This research adopted descriptive case study design. The study was carried out through social media platforms specifically *Facebook, Twitter* and *You Tube*. *Google* as a digital tool was used in data collection. Purposive and random sampling technique were used to enable the researcher get more data. This research used content analysis guide as its method of data collection. Data collected was qualitatively analyzed. This research showed that there is relationship between online comedy and mental health among Kenyans from the data that was collected, and that online comedy as any other genre has various roles to play in the society, like stabilizing our feelings, helping us be stable psychologically and above all reducing depression which influences the state of our mental health. The study was limited on specific social media platforms, yet we have new and emerging other social media platforms which could form basis for future studies.

Factors Affecting Emergency Response Time in Hospital Facilities in Kisumu County

Ryan Kubasu, Ruth Tawarar, Michelle Ayuma, Cosmas Korir, Kibaii University
teamgita039@gmail.com
0707519485

Abstract

Emergency response time remains a significant challenge worldwide. This is one of the challenges that is faced widely in hospital facilities in Kisumu County. This research aims to address the gaps that lead to delay in emergency responses. These gaps; impact of staffing capacity on emergency response time, assessment of extent of equipment and resource availability and evaluation of specific effects of NHIF to SHA transition on emergency response time. A descriptive cross-sectional study will examine how staffing capacity, insurance systems, and healthcare system transitions impact emergency response times. The target population includes 400 respondents: staff, patients, triaging teams, and relatives relevant to the study's objectives. Stratified random sampling will be used to ensure proportional representation of different subgroups (staff, patients, triaging teams, and relatives), with random selection within each group. Structured questionnaires (open- and closed-ended) and in-depth interviews will be used. Questionnaires will be administered to all respondents, while interviews will be conducted with key participants (e.g., healthcare staff, triaging team members) to gather detailed insights. Quantitative data will be analyzed using **SPSS**, focusing on descriptive statistics such as frequencies and measures of central tendency. Qualitative data will undergo **thematic analysis** to identify key themes related to the interrelations between staffing, insurance systems, and healthcare transitions. The study is guided by **System's Theory**, which emphasizes the interconnections between components like staffing, insurance, and healthcare transitions. This framework informs the selection of variables and explores how these interconnected factors affect emergency response efficiency. Ethical approval will be sought from the relevant institutional review board (IRB). Informed consent will be obtained from all participants, ensuring confidentiality and the right to withdraw at any time without consequence. Healthcare staff, patients, triaging teams, and relatives involved in emergency response. Individuals not directly involved in emergency processes or who do not provide consent. Certainly! Here's a revised version of the conclusion, tailored for a research proposal, and incorporating the suggestions you provided: The anticipated findings of this study will be instrumental in guiding targeted and measurable interventions aimed at improving the availability and responsiveness of emergency services for patients in Kisumu County. By aligning with the study's objectives, the insights gained will help inform specific hospital policies such as optimizing emergency department staffing models, refining triage protocols, and improving patient flow systems. These evidence-based recommendations will support policymakers, healthcare providers, and stakeholders in making informed decisions that enhance service delivery across hospital facilities. While this study is limited by its cross-sectional design which may restrict the ability to establish causal relationships—it will nonetheless provide a valuable foundation for future longitudinal research and policy development.

Effectiveness of Peer Support on Foot Self-Care Practices among Diabetic Patients in Western Kenya

Lucy Kageha Kavinguha
Masinde Muliro University of Science and Technology
lkageha@mmust.ac.ke
Phone number: +254714340621

Abstract

The global burden of diabetes is steadily rising with a parallel increase in related complications. Individuals with chronic conditions such as diabetes need assistance in learning, mastering, and sustaining complex self-care practices that support healthy living and prevent the development of complications. Peer support is an effective and cost-friendly intervention in the self-management of chronic health conditions to not only enhance self-care practices among diabetic patients but also prevent complications. Despite numerous literature showing evidence that peer support has benefits if implemented, its effectiveness on foot self-care practices among diabetic patients remains variable with very few studies documenting its use. The study aimed to assess the effectiveness of peer support on foot self-care practices among diabetic patients in Western Kenya. This was a quasi-experimental, nonequivalent control group post-test-only study. The intervention involved peer support in addition to standard treatment compared to standard treatment only in the control group. The study population was diabetic patients attending clinics in tiers five and six hospitals in Western Kenya. The sample size was calculated using the Charan and Biswas formula, and 58 participants per study site, totaling 116 individuals participated. Participants were conveniently sampled into the intervention and control groups. Data was collected using researcher-administered structured questionnaires while foot self-care practices were assessed using the Nottingham Assessment of Functional Foot care Questionnaire (NAFF). The intervention group showed significantly higher mean foot care practice scores of 61.1 compared to the mean of 35.7 in the control group (F=444.7, p <0.001) with substantial partial Eta^2 of 0.84. Level of education, employment status, positive attitude towards foot care and self-evaluation significantly influenced foot self-care practices. Peer support significantly enhances foot self-care practices among diabetic patients, potentially preventing diabetic foot complications. Based on the study's findings, it is recommended to integrate peer support programs into diabetes care settings to improve foot self-care practices

The Role AI on Climate Change and Mental Health among College Students' Performance

Michael Keari Omwenga[1], & Fredrick Kayusi[2,3*]
[1]Department of Education psychology, School of Education, Pwani University, 195-80108, Kilifi, Kenya.michaelkeariomwenga@gmail.com, ORCID: https://orcid.org/0009-0008-7982-1114
[2]Department of Environmental and Earth Sciences, Pwani University, 195-80108, Kilifi, Kenya, mg22pu3605021@pu.ac.ke, ORCID: https://orcid.org/0000-0003-1481-4016.
[3]Department of Environmental Studies, Geography, and Planning, Maasai Mara University, 861-20500, Narok-Kenya, fredrick Kayusi@gmail.com

Abstract
Mental health issues like stress, anxiety, trauma and existential issues are all made worse by the increased frequency of catastrophic weather events and environmental degradation brought on by climate change. Potential solutions to reduce climate change's negative effects on mental health are provided by digital advancements especially artificial intelligence (AI) and digital phenotyping. Access and solution adoption concerns must be carefully considered when integrating digital tools into climate-related mental health care. The aim of the research was to address the effects of climate change on mental health and scalability of digital interventions through cooperation amongst students. The study adopted cross-sectional study design targeting college students in Kisii region, Kenya. The convenience sampling method was used to sample 359 participants who were distributed questionnaires. Variables were examined using partial least square-structural equation modeling (PLS-SEM), and data analysis was conducted using the specialized statistical tool SmartPLS alongside with multiple linear regression and confirmatory factor analysis (CFA). The results demonstrate that college academic achievement of children and mental health are impacted by both climate change as well as artificial intelligence (AI). Moreover, digital learning is functioning as a beneficial moderating factor, amplifying the beneficial effect of AI and environmental degradation on mental well-being and academic accomplishment. By proving that adopting AI and climate change can increase student performance and wellness, these findings add to the discussion around technology to enhance education.

Keyword: *Mental health, climate change, artificial intelligence (AI), digital phenotyping*

Determinants of Adverse Outcomes of Low-Birth-Weight Neonates Admitted to the Newborn Unit at Kericho County Referral Hospital

Judy Cheptoo

Morris S. Senghor
0720640142

Mukhtar Kiprono
0722216266
Kabarak University

Abstract
Low birth weight (LBW), defined as less than 2,500 grams at birth, is a leading cause of neonatal morbidity and mortality, particularly in low-resource settings. In Kenya, LBW remains a significant public health concern, limiting progress towards neonatal survival targets outlined in the Sustainable Development Goals (SDGs), the WHO Every Newborn Action Plan, Kenya's Vision 2030, and the Kenya Health Policy 2014–2030. To determine maternal, neonatal, and health system factors associated with adverse outcomes among LBW neonates within 28 days of admission to the Newborn Unit at Kericho County Referral Hospital. A cross-sectional mixed-methods design will be employed. The quantitative component will involve data collection from a representative sample of 423 LBW neonates to assess associations between clinical and demographic variables and adverse outcomes. The qualitative component will consist of in-depth interviews and focus group discussions with caregivers and healthcare workers to explore systemic, contextual, and postnatal factors. Quantitative data will be analyzed statistically, while qualitative data will undergo thematic analysis. The study will identify key determinants of poor outcomes in LBW neonates, including maternal health interventions, socio-economic status, quality of postnatal care, and facility-level factors such as protocols for nutrition, thermoregulation, and respiratory support. It will also uncover gaps in care that contribute to neonatal mortality and morbidity. Findings will inform context-appropriate, evidence-based interventions to improve survival and long-term outcomes among LBW neonates in resource-limited settings. The study supports policy and programmatic goals aimed at reducing preventable neonatal deaths and enhancing maternal-newborn care in Kenya and similar contexts.

A Community-Based Study on the Relationship between the Three Delays Model and Perinatal Mortality in Lurambi and Butere Sub-Counties, Kakamega County, Kenya

Catherine Mutonyi Simiyu
Email: cmutonyi@kibu.ac.ke
Phone number: 0723908069,

Mary Kipmerewo
mkipmerewo@mmust.ac.ke

John Arudo
jarudo@mmust.ac.ke

Abstract

Globally, over 4.5 million perinatal deaths occur annually, greatest burden in developing countries with almost half from Sub-Saharan Africa. Perinatal mortality rate is approximately 34 per 1,000 births and 32 per 1000 births in Kenya and Kakamega County respectively. However, Lurambi and Butere sub-counties exhibit alarmingly high rates estimated at of 59 per 1,000 births. These figures relate to various underlying issues including delayed care-seeking, weak referral systems, and inadequate service delivery. Three Delays Model that refers to delays in deciding to seek care, reaching health facilities, and receiving adequate care offers a valuable framework for understanding causes of these deaths. Despite its relevance, the model's application in Kakamega County remains largely unexamined. This study aimed to assess how delays in seeking care, reaching health facilities, and receiving adequate care contribute to perinatal mortality in Lurambi and Butere sub-counties It was hypothesized that all three delays are significantly associated with increased risk of perinatal death. A retrospective, community-based cross-sectional study was conducted on 520 mothers who had delivered within the previous two years. Data were collected through structured questionnaires and key informant interviews. Quantitative data were analyzed using descriptive statistics and bivariate logistic regression, while qualitative data were thematically analyzed. Of 481 recorded births, 29 were perinatal deaths, reflecting 60 per 1,000 births. Timely care-seeking reduced the risk of perinatal death by 60 percent, while emergency preparedness lowered it by 90 percent. Access to appropriate health facilities decreased the risk to 90 percent. Lack of postnatal care was linked to a 51-fold increase in mortality. The findings affirm the relevance of the Three Delays and urgent need for targeting education on birth preparedness and danger sign recognition, strengthening referral systems and improving hospital staffing, supplies, and training. Their implementation will help reduce preventable perinatal deaths in high-risk areas like Kakamega County.

Mathematical Modeling for the Effects of Early Life Stress on Brain Development and Mental Health Trajectories

[1]Caren T. M., [2]Mutwiwa J. M., [3]Mulambula A, [4] Kwach B. O.

[1, 2, 3, 4] Department of Mathematics, Kibabii University. [1]carenmutonyi@gmail.com, [2]jmutwiwa@kibu.ac.ke, [3]amulambula@kibu.ac.ke, bkwach@ kibu.ac.ke

Abstract

The various adverse childhood and adolescent experiences known as early life stress produce enduring effects on brain development and mental health results. The complex relationships between these factors together with their time-dependent changes need further investigation. The research established a mathematical model to evaluate early life stress effects while analyzing equilibrium points and performing simulation-based evaluations of early life stress impact. The study built and examined a four- compartmental SEIR (Susceptible–Exposed–Impacted–Recovered) model with vital dynamics (birth and death rates) to assess the development and sustained psychological stress effects on children aged 0–17 living in Kenyan urban informal settlements. The model demonstrates how children move between psychological states of susceptible, exposed, impacted, and recovered based on stressor exposure, availability of protective factors, and access to mental health interventions, while incorporating non-infectious transmission dynamics and environmental stressor feedback. Stability analysis together with simulations were conducted using data from NUHDSS/APHRC, University of Nairobi psychiatric studies, and KEMRI biomarker sources. The MATLAB simulations demonstrate that building resilience together with environmental enhancements and early intervention programs play a crucial role in reducing long-term psychological effects of early life stress. This research uses mathematical and computational methods to reveal the fundamental processes that shape the enduring effects of early life stress. This research expands our understanding of how early life experiences shape long-term mental health results, which will help improve well-being and resilience throughout life. The research targets mental health professionals together with public health policymakers and educational and social services organizations.

Implementation of targeted postnatal care and its associated factors among midwives in selected public health facilities in Kakamega County, Kenya

Ruth M. Shitabule, Everlyne N. Morema, Tecla P. Sum, Morris S. Shisanya
School of Nursing, Midwifery and Paramedical Sciences, Masinde Muliro University of Science and Technology, Kenya
rushim2005@yahoo.com , +254723373475

Abstract

Targeted Postnatal Care (TPNC) is an approach involving a set of assessments and interventions given in four scheduled visits from birth to 6 months. This period is seen to be neglected yet studies show high rate of mortalities in this period. The goal is to improve outcomes for mothers and babies. The aim of this study was to assess the implementation of targeted postnatal care interventions and their variations across the four scheduled visits at selected public health facilities in Kakamega County, Kenya. The research sought to answer to what level and what factors influence TPNC implementation. This was a cross-sectional study conducted in the Maternal and Child Health (MCH) and maternity units of selected public health facilities in Kakamega County, a county in the Western region of Kenya. It employed quantitative methods in data collection using interviewer administered questionnaire. Data collected from 325 mothers and 160 midwives was descriptively analyzed, where the mean, median, and standard deviation were computed and compared across the visits. Analysis of variance (ANOVA) was used to measure the significance of the variations in implementation across the various visits. The study highlighted that not all the recommended interventions are implemented. There were significant variations in implementation level between different visits which decreased even further as the mother progressed through the period. Maternal targeted postnatal care interventions declining from (66.62%) at 48hour visit to (50%) at 4-6 months visit. Similarly, newborn interventions declined from (59.55%) at 48hour visit to (57.5%) at the 4-6 months. These results demonstrate suboptimal implementation of TPNC, which can frustrate efforts in achieving sustainable development goals. Considerations should be made to make the visits convenient through hospital delivery and follow ups through community midwifery. For implementation to be more comprehensive, equally postnatal care must be given priority on resource allocation by the ministry of health to mitigate health facility challenges.

Keywords: Mothers, target postnatal care, Western Kenya

Exploring Digital Innovations to Address Third Delay Factors Facility-Based Perinatal Care in Selected Health Facilities in Bungoma County

Catherine M. Simiyu,
cmutonyi@kibu.ac.ke,
0723908069

Morris S. Senghor
Kibabii University

Abstract

Despite increased facility-based deliveries, Bungoma County continues to experience high perinatal mortality rates, largely due to persistent third delay factors within health facilities. These include delays in clinical decision-making, inadequate intrapartum monitoring, limited emergency obstetric and neonatal care, and inefficient referral systems. Digital innovations have shown promise in addressing these bottlenecks in other low-resource settings.

Objective
To explore the feasibility and potential of digital innovations in addressing third delay factors affecting perinatal care in selected health facilities in Bungoma County.

Methods
A mixed-methods design will be employed. Quantitative data will be collected through structured surveys with healthcare providers, while qualitative insights will be obtained through key informant interviews and focus group discussions. Descriptive and inferential statistics will be used for quantitative analysis, and thematic analysis will be applied to qualitative data. Ethical approval will be obtained, and informed consent secured from all participants.

Results
The study will identify key third delay challenges, assess service delivery gaps, evaluate healthcare workers' readiness to adopt digital tools, and recommend context-appropriate digital innovations suitable for Bungoma's health facilities.

Conclusion
This study will generate actionable insights to inform the integration of digital technologies that strengthen maternal and newborn care at the facility level. The findings aim to guide policy and programmatic interventions focused on reducing perinatal mortality through improved clinical efficiency and care quality in Bungoma County.

Addressing Long-Term Mental Health Challenges in the AI-Driven Digital Workplace

Muruga Deogratius[1]
Pioneer International University,
P.O. Box 3342
Nairobi, Kenya,
deogratius.muruga@students.piu.ac.ke.

Joan Kiptoo[2]
Pioneer International University,
P.O. Box 3342
Nairobi, Kenya
joan.kiptoo@students.piu.ac.ke

Patience Gichuhi[3]
Pioneer International University,
P.O. Box 3342
Nairobi, Kenya,
patience.gichuhi@students.piu.ac.ke

Abstract

As artificial intelligence (AI) becomes increasingly integral to modern digital workplaces, the long-term implications for employee mental health are not yet fully understood. This investigation aims to evaluate the hypothesis that sustained exposure to AI-enhanced work environments characterized by automation, algorithm-driven management, and virtual communications may be associated with increased psychological distress, including anxiety, burnout, and perceived job insecurity. Employing a mixed-methods research design, this study combines quantitative surveys with qualitative interviews to analyze mental health outcomes among employees across diverse sectors utilizing AI technologies. A stratified sample of 100 professionals, aged 25 to 65, was carefully selected from the IT, finance, healthcare, and manufacturing industries to ensure robust representation across different contexts. Data collection will utilize standardized assessment tools such as the General Health Questionnaire (GHQ-28) and the Job Content Questionnaire (JCQ), combined with semi-structured interviews to capture nuanced personal narratives. For data analysis, we will employ multivariate regression techniques alongside thematic coding to uncover patterns and potential causal relationships. The findings are expected to provide valuable insights into policy formulation and organizational strategies aimed at mitigating the psychological impacts linked to AI integration in the workplace. By addressing these critical emerging challenges, this research aims to facilitate the development of more sustainable and mentally resilient digital work environments.

*Keyword*s: Mental health, Artificial Intelligence (AI), Digital workplace, JCQ, GHQ-28, burnout, IT, Automation.

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Leveraging Artificial Intelligence (AI) in Education: A Case Study of Kibabii University

Boniface Wakholi & Jane Barasa
bwakholi@kibu.ac.ke & jbarasa@kibu.ac.ke

Abstract
The integration of Artificial Intelligence (AI) in education has significantly transformed teaching and learning methodologies worldwide. This paper explores the adoption and impact of AI in education, focusing on Kibabii University as a case study. A regression analysis was conducted to examine the uptake of AI-based tools and their effect on students' academic performance. Findings indicate a strong correlation between AI adoptions and enhanced learning experiences, with an R-squared value of 0.78, suggesting that AI adoption significantly contributes to academic success. Additionally, 65% of students and 72% of lecturers have interacted with AI-powered educational tools, primarily within the university's Learning Management System and research applications. Cross-tabulation analyses highlight the relationships between demographic factors and AI adoption levels, revealing that students in sciences have the highest AI adoption rate (71.4%), followed by business (62.5%) and arts (57.4%). The ANOVA results confirm that AI adoption significantly influences academic performance (F = 14.23, p < 0.000). These findings underscore the need for policy frameworks to accelerate AI integration in higher education institutions.

Keywords: *Artificial Intelligence, Education, Digital Transformation, ICT, Regression Analysis, Learning Management System*

Integration of Information Technology and Machine Learning for Pandemic Surveillance and Resource Maximization

Sirengo John Luca
jsirengo@kibu.ac.ke
Department of Mathematics, Applied Statistics
Kibabii University, Kenya

Abstract

This study focusses on integrating information technology and machine learning procedures for pandemic surveillance and healthcare resource maximization. This study explores the application of mathematical estimation models utilizing the Maximum Likelihood Estimation (MLE) method within machine learning frameworks to enhance early warning detection, optimize resource allocation, and improve coordination during public health emergencies. By leveraging MLE's statistical rigor for parameter estimation, the research demonstrates how predictive models can more accurately identify emerging risks, forecast resource demands, and facilitate efficient multi-agent collaboration. The results from the developed procedure will be compared to traditional approaches. The frameworks adaptability across different healthcare infrastructures will be discussed for future pandemic and disaster preparedness efforts.

Keywords: Pandemic surveillance, healthcare resource maximization, public health emergency preparedness

Factors Influencing Access to Cervical Cancer Screening Services Among Women of Reproductive Age in Kisii County, Kenya

Sibota Benson [1], *Mosol Priscah [2] Nyaga Emily [3]
1. Department of Health, Kisii Teaching and Referral Hospital
2. Department of Nursing Education, Leadership Management and Research, School of Nursing and Midwifery, Moi University, Kenya
3. Department of Adult, Child and Mental Health, School of Nursing and Midwifery, Moi University, Kenya
*Corresponding Author: priscahm@mu.ac.ke   Phone: +254721558607

Abstract

Cervical cancer is the second most prevalent cancer after breast cancer in Kenya and the leading cause of cancer deaths with an increasing incidence. In spite of the possible prevention with early detection through screening, only 4% of reproductive age women in Kisii Sub-County were screened for cervical cancer in 2017 against the national target of 75%. This study sought to identify and analyze the socio-demographic, knowledge-based, and logistical factors influencing the uptake of cervical cancer screening among women of reproductive age in Bomachoge Chache Sub-County, in Kisii County, Kenya. A mixed methods study design was applied where 394 participants were selected for the study using stratified random sampling with triangulation at data presentation and discussion of findings. Data was collected using questionnaires and focus group discussions. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 27. Chi-square test was used to determine predictors of cervical cancer screening. A p-value of less than 0.05 (typically ≤ 0.05) was considered statistically significant. Qualitative data was analyzed thematically. Data was presented in tables and pie charts and narratives for qualitative data. Majority, 206 (57.5%) of the participants were aged between 16 to 29 years, 190 (53%) were married with over 67% of them had secondary school education. More than half 248(69.2%) of the participants were aware of cervical cancer. Out of those who indicated they had heard of screening, 57 (54.8%) had been screened within the past 18 months. Regarding source of information on cervical cancer, results showed that, 126 (35.2%) were from health care workers and 110 (30.8%) from the media 57 (16%). Chi-square results showed that, cervical cancer screening was positively associated with feeling of being at risk of cervical cancer (p <.0001), not being afraid of screening procedures (p <.0001) and a distance of <1km from the nearest screening center (p < .0007). Screening practices for cervical cancer were positively associated with knowledge, having no fear about screening procedures and distance to cervical cancer screening health facilities. Awareness campaigns through mass media and outreach programs are needed to increase access to cervical cancer screening. In addition, investments in improving infrastructure and staff training at rural health facilities are recommended to enhance screening accessibility.

Keywords: Cervical cancer screening, access, Bomachoge Sub County

Validating Adapted Theory of Planned Behaviour in Predicting Postpartum Family Planning Intentions in a Western Kenya: Pragmatic Randomized Control Trial

Morris Senghor Shisanya[1], Mary Kipmerewo[2], Everlyne Morema[2], Collins Ouma[3]

Abstract

High population growth in developing countries like Kenya necessitates increased uptake of early postpartum family planning (PPFP). While PPFP is critical for maternal and child health, there is a paucity of research utilizing behavioral theories to optimize PPFP uptake in resource-limited settings. This study evaluates the utility of an adapted Theory of Planned Behaviour (TPB) in predicting intentions for early PPFP among postpartum women in Western Kenya. This study aims to validate an adapted Theory of Planned Behaviour (TPB) model to predict postpartum family planning intentions among women in Western Kenya using a pragmatic randomized controlled trial approach. A pragmatic randomized controlled trial was conducted among pregnant women aged 15–49 attending antenatal care clinics. Participants were randomly assigned to a "Nurses' arm," "Community arm," or "Control arm." Intervention arms received structured FP counseling by trained nurses or Community Health Workers (CHWs), while the control group received routine care. Ethical approval was obtained, and informed consent was secured from all participants. TPB constructs were assessed via structured client exit interviews. Structural Equation Modeling (SEM) was used to evaluate the predictive power of TPB constructs on early PPFP intention. The final SEM model excluded client knowledge on early PPFP. Significant predictors of PPFP intention included satisfaction with counseling ($P = 0.001$), perceived normative beliefs ($P < 0.0001$), positive attitude towards PPFP ($P < 0.0001$), behavioral control over PPFP choice ($P = 0.018$) and perceived risk of postpartum pregnancy 0.614, with an R^2 of 0.71 thus showing that 71% of variance in intention to use PPFP in the first three months of delivery was accounted for by the exogenous constructs in the model. The adapted Theory of Planned Behaviour effectively predicts intention for early PPFP in postpartum women. Findings support its integration in future interventions aimed at improving early postpartum contraceptive uptake.

Behavioural and Environmental Determinants of Upper Respiratory Tract Infections in Mbale Community, Vihiga County

Catherine M. Simiyu, Dorothy Moraa, Lilian Walingo, Wafula Elias,
Magara Geofrey, Amos Nyakundi
Kibabii University
teammbaale@gmail.com
TEL: 0769167093

Abstract

Mbale community in Vihiga County has experienced a high prevalence of respiratory illnesses, particularly upper respiratory tract infections (URTIs), which are characterized by irritation and swelling of the upper airways. These infections pose a growing public health concern in the area. Despite their frequency, limited research had explored the specific environmental and behavioural determinants influencing URTI prevalence within this community. This study aimed to identify the behavioural and environmental risk factors associated with URTIs in Mbale. It specifically assessed the association between community health behaviours, environmental exposures, and the incidence of URTIs. The study was guided by the hypothesis that environmental pollutants and poor health behaviours significantly contributed to higher rates of URTIs. A mixed method approach was employed. Quantitative data were collected through a cross-sectional survey conducted among 125 households using questionnaires, while qualitative data were obtained via focus group discussions and key informant interviews involving community members, healthcare providers, and local leaders Random sampling method was used. The findings revealed that environmental exposures, such as dust, smoke, and chemical pollutants alongside behavioural factors like poor hygiene, limited mask usage, and lack of social distancing, were strongly associated with increased URTI cases. Qualitative data further revealed that limited awareness and high healthcare costs hindered effective prevention and timely treatment of URTIs. Data was analyzed used SPSS in graphs, tables and charts. Thematic analysis was done for qualitative data. The study concluded that a combination of environmental and behavioral determinants significantly influenced the prevalence of URTIs in Mbale .community-based interventions including health education, promotion of hygiene and preventive behaviours, and strategies to reduce harmful environmental exposures were put in place.

Knowledge and use of Chatgpt Amongst Students of Faculty of Allied Health Sciences of Bayero University, Kano

Chioma Judith Mba, Ahmed Suberu, Abdulrashid Idris, Abdulmalik Musa Aliyu, Umar Lawal Bello, Amina Rajah, Hauwa Mikail
Department of Nursing Sciences, Bayero University Kano
Corresponding Author: Chioma Judith Mba
chomjud3679@gmail.com
08065419192, 08176627790

Abstract

Artificial intelligence has garnered significant attention across various fields and education is no exception. A chatbot is a computer program that stimulates a conversation with users through natural language or text giving the user an illusion of communicating with a human and chatgpt is such chatbot. The aim of this study is to assess the knowledge and use of chatgpt among students of Faculty of Allied Health Sciences. The study utilized a descriptive research design where a sample size of 253 was derived using the Taro Yamane's formula and a simple random sampling technique was used to select the participants. Data was analyzed using SSPS (version 27). Results showed that majority (97.6%) have heard of chatGPT before taking the survey with a significant portion (46.8%) rating themselves as very familiar with it. A significant number of the students (74.6%) held positive views about using chatgpt, with 24.2% describing their views as very positive and 50.4% as "positive". Results also showed that 51.2% of the respondents stated social media as part of what influenced them to use chatGPT. In terms of utility, respondents (43.7%) found chatGPT moderately helpful, 37.3% found it very helpful, and 4.8% found it extremely helpful. More so, results showed that respondents predominantly used chatGPT for learning purposes with 58.3% using it for essays or assignments, 56.7% using it for clarification of concepts or definitions and 50.4% use it to answer study questions. Additionally, 31.0% reported using it to find research materials and 29.0% used it generating study notes. In conclusion, the research revealed a predominantly young and diverse user base with a high level of awareness of chatGPT, with peer influence and social media playing a significant role in shaping the knowledge of chatGPT. Respondents also hold a positive view of chatGPT with majority using it for assignments and personal queries.

Keywords: Knowledge, Use, chatGPT, Artificial Intelligence

A cardiovascular Disease Mathematical Model Incorporating Personal Risk Factors and Prevention Measures

Jacinta M. Mutwiwa
Department of Mathematics, Kibabii University
jmutwiwa@kibu.ac.ke
+254 702 611 172

Abstract

Cardiovascular disease poses a significant global health challenge, demanding innovative approaches for prevention and control. Cardiovascular disease is the leading cause of death worldwide as it affects people of all ages, sexes, ethnicities and socioeconomic levels. However, the disease can largely be prevented by leading a healthy lifestyle. In this study, a deterministic mathematical model for cardiovascular disease incorporating personal risk factors was developed and analyzed. The model incorporates lifestyle modifications as key components, recognizing their impact on Cardiovascular disease risk. Stability analysis of the model showed that the disease free equilibrium point is locally asymptotically stable whenever $R_0 < 1$. The endemic equilibrium exist and is locally asymptotically stable whenever $R_0 > 1$. Numerical simulation of the model highlights a critical threshold behavior, when τ crosses approximately 0.63 the point where $R_0 = 0$ the system transitions from disease elimination to endemic persistence. This threshold is derived from the model's parameters, emphasizing that, controlling personal risk factors below this critical value can prevent the disease from becoming endemic.

Keywords: *Cardiovascular disease, Personal risk factors, Stability analysis.*

Situation Analysis of HIV, Hepatitis B, and Syphilis among Pregnant Women: A Case of Burco General Hospital, Somaliland

Abdirisaq Muse Osman[a]* & Lucy Natecho Namusonge[b]
[a]University of Burco, School of Public Health (Epidemiology & Biostatistics). Buroa, Somaliland.
Email: arzkmuse945@gmail.com   **ORCID:** https://orcid.org/0009-0004-5644-4951
[b]Kibabii University, School of Nursing. P. O. Box 2008– 50200, Bungoma, Kenya.
Email: lucy.namusonge@gmail.com **ORCID:** https://orcid.org/0000-0001-8319-7467
***Author for correspondence email**: lucy.namusonge@gmail.com

Abstarct
This paper highlights the burden of HIV, hepatitis B, and Syphilis among pregnant women living in Burao, Somaliland. Due to the lack of previous literature and weak health system surveillance, there is little progress on eliminating these three STDs through ANC to protect mothers and their newborns. The study highlights the need for a maternal healthcare approach that is equal in its global application to be established to provide relevant diagnosis, information, and care to pregnant women to eliminate these three diseases.

Keywords: HIV, Hepatitis B, Syphilis, Pregnant women, Burao, Somaliland

Authors' contributions
All authors have made substantial contributions to all parts of the research process.

Disclosure
The authors declare no competing interests in this work

Ethics and consent
The study was done according to the Helsinki Declaration. Ethical approval was obtained from the University of Burao ethical review committee (REF: UOB/ERC/APPROVAL/23). A letter of permission was obtained from the medical director's office of Burao General Hospital (REF: BCH/127/2023) to communicate with head nurses/midwives of the selected wards and the laboratory department. The mothers were informed about the purpose, the right to participate, the confidentiality of information, and the intent to publish the results without using their names or initials to conceal identity but anonymity cannot be guaranteed. Written consent was obtained from the mothers.

SUB-THEME #3
ENERGY AND ENVIRONMENT

A Survey conducted for proposed development of a model using deep learning technology to monitor and safeguard coastal environment

Zachariah Munyoro Mwangi
Kibabii University
zachariah22@student.kibu.ac.ke
0725875085

Abstract

With increased diverse activities carried out by humans along coastal regions across the world, beach fronts and marine ecosystems are exposed to high level of habitat diversity loss and destruction. One of the major contributors to such problems is the trash that accumulates along the beaches. There are various approaches that have been carried out by different organizations towards eradication of this challenge. However, they have not been successful in dealing with beach litter issues. This research was aimed at making use of citizen science and internet-enabled cameras to collect litter data along the coastal beaches in selected counties of Kenya and apply deep learning techniques to detect and classify the data. The overall objective was to establish how much litter is dumped on the beaches so as to develop a deep learning based model for predicting beach litter accumulation trends. This paper provides the results for a survey conducted using questionnaires in three of the five counties along the Kenyan coast with the purpose of achieving a specific objective of the research. This objective was determination of the technologies being used in managing beach litter along Kenyan beaches. The sample size was 300 people, with confidence level of 95% and standard deviation of 0.5. Margin of error was 0.05. It was established that 58% of the respondents considered manual clean-ups by volunteers as the main method in eradication of beach litter. Majority of the respondents preferred use of technology as the best alternative in dealing with beach litter. However 38% of the respondents indicated that they are not aware of any technology being employed. One key limitation of the survey is some element of bias in responding to questions. The results showed that there is need to apply technology in managing litter along Kenyan coast.

Climate Refugees

Milcah N. Nyongesa
Department of Language and Literature, Masinde Muliro University of Science and Technology
Email: milcahnam8@gmail.com
Phone: 0795886469

Abstract
Climate refugees are individuals and communities that are forced to migrate due to impacts of climate change which are becoming an increasingly pressing issue globally. The importance of studying climate refugees lies in the fact that climate change is expected to displace millions of people in the coming decades and understanding the needs and experiences of these individuals is crucial for developing effective policies and interventions. Despite the growing concern, there's a significant research gap by examining the experiences and needs of climate refugees in host communities in East Africa. There is also a need to explore the socio-economic and cultural characteristics of climate refugees as well as the challenges they face in host communities. The methodology employed in this study includes a mixed-method's approach, combining quantitative and qualitative data collection and analysis methods. The findings of the study reveal that climate refugees in host communities have limited access to basic services, discrimination and social isolation. This study therefore highlights the importance of community-based approaches to supporting climate refugees as well as the need for greater attention to their socio-economic and cultural needs. The implications of this study are significant for policymakers, practitioners and researchers working in the field of climate migration. The policies and interventions must take into account the unique needs and experiences of climate refugees and those community-based approaches are crucial for supporting these individuals.

Keywords: Climate refugees, climate change, needs, host communities

Towards Bridging Climate Perception and Reality: Intersection of Local Knowledge and Scientific Data

[1] *Meshack Opole Ombogo*
Kibabii University
E-mail: mopole@kibu.ac.ke
Tel: 0721771464

[2] *Humphreys Were Obulinji*
rEgerton University
E-mail: humphreys.obulinji@egerton.ac.ke
Tel: 0721664266

[3] *Amon Karanja*
Masinde Muliro University of Science and Technology
E-mail: amwangi@mmust.ac.ke
Tel: 0715701221

Abstract

The aim of the study was to identify convergences and discrepancies between Farmers' perceived and actual climate trends in Narok County. Narok County was targeted because her core economic sectors are dominantly climate driven. Purposive and multi-stage sampling technique were used to select representative administrative wards for farmers' selection. The study achieved a 67% response rate (222) out of the 371 targeted farmers. Perception data was gathered through questionnaires administered to the sampled wheat farmers while instrument data (temperature and rainfall) was obtained from the Kenya Meteorological Department. Trend analysis, correlation, and paired frequency analysis were employed in the investigation. Long-term mean and maximum temperature had risen by 0.03°C and 0.6°C per annum, while maximum temperature signaled a decline. Rainfall had experienced a minimal decline over the study period. Ten-year moving average revealed an existence of variability in rainfall. An extremely wet year was recorded in 1963, while extreme dryness was not observed for any of the years. 60% of the respondents observed rising temperature trends, while a decline in rainfalls was reported by 51% of the respondents. Coincidence between frequencies of the two sets of observations was evaluated using Pearson's correlation coefficient (r) at a 95% confidence interval. There was a non-significant agreement ($r = 0.12$; $t = 0.68$) between farmer observations and instrument-based records about dry years. A convergence between farmers' accounts and instrument records on wet years was moderate and statistically significant ($r = 0.43$; $t = 2.53$). The findings illuminate the validity and limitations of local climate knowledge and how it influences decision-making in agriculture. Bridging the gap between perception and empirical reality would thus be essential for resilient wheat farming systems in the face of growing climate uncertainty.

Keywords: *Climate Variability, Wheat Farming, In-situ Data, Farmers' Observations*

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Long-Term Assessment of the Spatial-Temporal Trends in Selected Cloud Radiative *Properties* over *the three Distinct Sites in Kenya*

Sostine N. Makokha[1], John W. Makokha[1] Festus B. Kelonye[2]
[1, 2] Department of Science, Technology and Engineering, Kibabii University
P.O. BOX 1966-50200, Bungoma, Kenya

Abstract
The presence of clouds in the Earth's atmosphere plays a pivotal role in regulating the Earth's energy budget. Increased anthropogenic activities and emissions can significantly lead to changes in cloud composition and structure, affecting the cloud properties, causing alterations in the climatic conditions globally. This study examines the spatiotemporal trends of cloud radiative properties that include Cloud Effective Radius (CER), Cloud Optical Thickness (COT) from MODerate resolution Imaging Spectroradiometer (MODIS) sensor, Water Vapor (WV), and Cloud Albedo (CA) from Modern-Era Retrospective Analysis for Research and Applications, version 2 (MERRA-2) model and Precipitation Rate (PR) from Tropical Rainfall Measurement Mission (TRMM) over Nairobi, Malindi, and Mbita, Kenya, from 2005 to 2020. Results show seasonal and regional variations, with CER fluctuating between -0.06 and 0.04 across the three sites, while COT exhibited mixed trends, ranging from -0.15 to 0.03. WV showed minimal changes, with slight increases over Malindi and Mbita during the study period, whereas PR declined over Nairobi and Malindi (-0.005 to -0.1) but remained stable over Mbita. Additionally, CA varied across locations, with Nairobi (-0.003 to 0.003), Malindi (-0.0045 to 0.0045), and Mbita (-0.0015 to 0.0015). Spatial trends in the selected cloud properties were determined and observed to vary both seasonally and regionally, the study also revealed patterns of trends in cloud radiative properties over Kenya.

***Keywords**; MODIS, MERRA-2, TRMM, COT, CER, PR, CA, CF, Seasons and clouds radiative properties*

Environmental Consciousness and Cultural Identity: An Ecocritical Study of Unbowed by Wangari Maathai

Christine Namayi & Joseph Musungu
Department of English, Literature, Journalism and Mass Communication
Kibabii University
cnamayi@kibu.ac.ke, jmusungu@kibu.ac.ke
0722393425; 0710839354

Abstract
Environmental degradation remains a pressing global concern and Kenyan writers have increasingly used their works to highlight the ecological crises. This study explores environmental consciousness and cultural identity in Unbowed by Wangari Maathai. It shows how literary writers use literature as a tool for environmental awareness and advocacy. The objectives for the study are to evaluate the role of women, as portrayed in *Unbowed*, in bridging environmental consciousness and the preservation of cultural heritage within the Kenyan context and to examine the literary strategies employed by Maathai in *Unbowed* to effectively convey the inseparable link between environmental well-being and cultural survival. This study will employ a qualitative research methodology, primarily relying on close textual analysis informed by ecocritical and cultural studies theories. It will involve identifying key themes, examining narrative strategies, and contextualizing the text within its historical, political, and biographical background, as well as relevant scholarly conversations. The goal is to provide a nuanced understanding of how Wangari Maathai's *Unbowed* illuminates the intricate relationship between environmental consciousness and cultural identity in the Kenyan context. The findings underscore the need for greater integration of environmental themes in literary studies and policy discussions, reinforcing the role of literature in addressing pressing ecological concerns.

Ecocriticism and Travel Studies

Milcah Namukuru Nyongesa
Department of Language and Literature
Masinde Muliro University of Science and Technology
Email: milcahnam8@gmail.com
Phone: 0795886469

Abstract
Ecocriticism is concerned with the relationship between cultural texts and the environment. It is the study of the relationship between literature and the physical environment. It takes an earth-centered approach to literary studies. The research gap is the lack of a comprehensive understanding of the environmental impact of travel. While there has been studies on the environmental impact of different modes of transportation, there is still a need for more research on the specific ways in which travel contributes to environmental degradation. The objective of ecocriticism and travel studies is to identify the environmental impact of travel and to develop strategies for reducing that impact. The method of data collection and analysis include survey and interviews. The key findings in ecocriticism and travel studies often highlight the significant contribution of travel to greenhouse gas emissions and air pollution. They also identify ways in which travel can be more sustainable by the use of alternative modes of transportation, the promotion of sustainable development of more environmentally friendly travel infrastructure. The implication of ecocriticism and travel studies are significant as they highlight the need for individuals, governments and businesses to take action to reduce the environmental impact of travel. Understanding the environmental impact of travel and developing strategies for reducing that impact, a sustainable future will be created.

The role of children's literature in the fight against climate change: An analysis of selected children's art and poems about climate change around the world

Dennis Wabuyaka

Abstract

At this point in history, we are confronted with a cluster of crises, chief among them are climate-related catastrophes resulting from global climate change. It is increasingly evident that the physical world is in crisis, largely due to environmental degradation driven by modernity. The climate crisis is fundamentally and irreparably reshaping our world, with grave implications for the rights and futures of today's children and generations to come. This paper explores the role of children's art and poetry on climate change from a global perspective. Grounded in ecocriticism theory, the study investigates how children's literature, particularly in the form of art and poetry, contributes to environmental conservation. The findings highlight the crucial role that children's creative expression plays in raising ecological awareness and inspiring action. Additionally, this work contributes to the growing body of knowledge in children's literature and environmental criticism. In conclusion, children's literature, especially art and poetry, serves as a powerful tool in efforts to restore, preserve, and conserve our environment.

Keywords: children's literature, restoration, preservation, environment, climate change

Community Vulnerability to Flood Risk in the Gucha-Migori River Basin, Kenya

Ogallo S.N.[1*], Mwikali V.K.[2], & Oteng'i S.B.[3]
1*Corresponding author, email: steveogallo@kibu.ac.ke, Contact: +254725940266
1 – Kibabii University
2 & 3 – Masinde Muliro University of Science & Technology

Abstract

Flood risk management varies globally, with low-income communities being the most vulnerable. While countries like the Netherlands and Japan integrate structural and non-structural measures, developing nations often adopt reactive approaches due to financial and institutional challenges. In Kenya, flooding is a frequent disaster affecting regions such as Budalangii, Nyando, and the Gucha-Migori River Basins. The government of Kenya, in collaboration with international agencies, has implemented the Integrated Flood Management (IFM) strategy, incorporating early warning systems, river basin management, and structural defenses. However, challenges like climate change, deforestation, and poor land-use planning continue to worsen flood risks. The lower Gucha-Migori River Basin faces annual flooding during rainy seasons, severely impacting riparian communities despite ongoing mitigation efforts. This study examined the IFM framework to assess the relationship between community vulnerability and flood risk management in the Gucha-Migori river basin. A combination of evaluation and correlation research methods was employed. Satellite imagery data was used to identify flood-prone areas and estimate flood depth, extent, and rate of increase. Hydrological, hydraulic, and digital elevation models were developed to generate flood maps showing spatial coverage and recurrence intervals. By integrating land use maps with socioeconomic data, regions experiencing the most significant flood damage were identified. The resulting damage maps were merged with flood maps to create return-period damage maps, which were further compiled into a comprehensive flood risk map using ArcGIS Version 10.5 software. Findings revealed that villages within the floodplain were the most susceptible to flood hazards. Physical and social vulnerabilities were mapped, showing that four common structural types emerged from nine identified household building types. The most vulnerable structures were those with mud walls and ground floors, whereas the least vulnerable structures had concrete floors, concrete walls, and sheet iron roofing. Socioeconomic factors also played a crucial role, as higher-income households possessed more valuable building contents, leading to greater losses during floods. The vulnerability of external property was found to depend on individual preparedness and the community's capacity to cope with flooding. Statistical analysis using the Pearson Chi-Square test ($\chi^2 = 31.240$, df = 3, p = 0.000) demonstrated a significant relationship between community perceptions of IFM adequacy and their willingness to modify buildings for flood protection. This suggests that perceptions of IFM's effectiveness strongly influenced attitudes toward structural modifications as a flood risk management strategy. The study highlights the need for a more community-centered approach to flood management, integrating structural and non-structural measures to enhance resilience in the lower Gucha-Migori river basin.

Keywords: Community Vulnerability, Flood Risk, Flood Damage Maps, IFM

SUB-THEME #4

EDUCATION AND HUMAN CAPITAL DEVELOPMENT

Integrating 3D Printing into STEM Education: Building Innovation Capacity in Emerging Economies

Joan C. Kiptoo
Pioneer International University
Email: Joan.kiptoo@students.piu.ac.ke
Phone: +254703470205

Abstract

The demand for the Fourth Industrial Revolution is accelerating and requires educational systems to equip learners with advanced technological skills to solve challenges using these technologies. The incorporation of 3D printing technology into STEM education is a crucial step to achieving human capital development, yet many institutions face significant gaps in access to practical and innovation-driven education. This paper employs desktop research, analysing secondary data from peer-reviewed articles, education policy reports, and case studies published between 2014 and 2024, with a focus on emerging economies. The data was examined through thematic analysis using a socio-technical systems lens to identify patterns in implementation, pedagogical outcomes, and innovation potential. The findings highlight that integrating 3D printing in schools and community centers enhances experiential learning, creativity, and problem-solving among the youth. Using case examples like Kenya's FabLabs and India's Atal Tinkering Labs, students demonstrated significant improvements in project-based learning outcomes and localized problem-solving capabilities. The study further identifies barriers such as resource constraints, teacher training gaps, and policy inertia, proposing strategic interventions for scalable implementation. Ultimately, the paper argues that embedding 3D printing into STEM education systems is a vital pathway toward nurturing a future-ready workforce aligned with Sustainable Development Goal 4 (Quality Education) and the vision for an innovation-driven society.

Keywords: 3D Printing, STEM Education, Innovation Capacity, Human Capital Development

Effect of Role Modelling on Professional Conduct of Teachers in Public Secondary Schools in Western, Kenya

Mary Maruti & Julius K. Maiyo
Department of Education Planning and Management,
Kibabii University, Kenya
marutimary@gmail.com & maiyojulius@kibu.ac.ke

Abstract
Teachers are perceived most valuable asset or resource to the achievement of the primary objectives of education in any Kenyan school. Just like employees in other institutions, their professional conduct should be given due consideration if public secondary schools have to meet their strategic goals. Role modeling has been acclaimed as a powerful teaching strategy to impact behavior. However, despite the use of role modeling, the issue of teacher professional misconduct in public secondary schools in Kenya is still prevalent. This study aims to investigate the effect of role modeling on professional conduct among public secondary school teachers. Mixed method design was adopted. 1304 respondents comprising of 68 principals, 279 HoDs and 957 teachers drawn from extra county secondary schools were targeted. A sample size of 299 was determined using Krecjcie and Morgan table (1970). It comprised, 23 principals, 138 HoDs (mentors) and 138 teacher mentees. Simple random sampling was employed to select 23 extra county schools where the respondents were drawn. Principals were purposely sampled while simple random sampling was used to select mentors and mentees). Data from principals was collected using interview schedules while questionnaires were administered to HoDs and novice teachers. Results revealed a very weak positive relationship between role modeling and professional conduct. The weak correlation (R = 0. 038), negligible explanatory power (R^2 = 0.001), and non-significant ANOVA results (p =0 .558) collectively indicate that role modeling, as examined in this study, is not good a predictor of teacher professional conduct. The results suggest that role modeling may have some intrinsic value in mentorship programs, but does not independently serve as a key determinant of professional conduct among teachers. The researcher recommends a reevaluation of role modelling mentorship role as a strategy for teaching behavior with need to explore alternative or additional factors that may more substantially influence professional behavior among educators in this context.

Keywords: Role modelling, Professional conduct, Mentorship

Doctoral Supervision Development: The Why, How and Who?

[1]Irene Simiyu, [2]Nobert Wanjala Wanyonyi and [3]Robert Omula Kati
Email: [1]isimiyu@kibu.ac.ke -Kibabii University
Email: wanjalawanyonyi@kibu.ac.ke –Kibabii University
Email: omulakati@kibu.ac.ke – Kibabii University
Corresponding Author: Irene Simiyu. Email: [1]isimiyu@kibu.ac.ke

Abstract

There is consensus in literature that developed and developing Nations need more and more doctorate holders in this century, especially because of their ability to contribute to the knowledge economy. This need has confirmed the centrality of an effective supervisor in the doctoral journey, given the part they play in the on-time completion of the degree, its quality and the quality of the PhD graduate. Closely connected to the current demand of the doctorate, is the emergence of a new focus on the abilities, skills and knowledge that a doctoral supervisor requires to be confident in their role and effectively supervise doctoral candidates. This research paper looks at the issue of the professional development of doctoral supervisors, with a focus on Kibabii University. The questions that guided the study are: what professional development should be given to support the doctoral supervisor? Who should give this support? How should the opportunities be organized? The study targeted 60 doctoral supervisors in an online survey, among them veteran and novice supervisors. The analysis was done using the google forms and presented as tables and pie charts. The key findings indicate consensus on the need for professional development opportunities to be availed for both veteran and novice supervisors. The findings are significant for higher education stakeholders who support graduate faculty in their role of supervising student research, as well as serve on the examination panels. Institutions of higher learning and University managements are advised to lead this support, if they hope to achieve higher on-time completion rates, as well as quality doctorate degrees. The researchers hope that Institutions of higher learning will be convinced on the need to develop institutional frameworks for supporting supervisors.

Keywords: doctoral supervisor, professional development, doctoral candidate, doctorate

Teachers' Pedagogical Content Knowledge on Learners' Mathematical Competencies in Junior Schools, Bungoma County, Kenya

Pembere Tuya Janet, Edwin Masibo, Christine Nabwire
Kibabii University, Kenya
0708475179
Janetpembere2016@gmail.com

Abstract

Education is an equalizer and every learner is entitled to quality and differentiated education. The vision of the Competence Based Curriculum (CBC) is to develop holistic learners who are independent, confident, cooperative and inspired learners equipped with competencies to thrive in the modern world. This study investigated the influence of pedagogical content knowledge (PCK) of teachers on learners' achievement of problem-solving and critical thinking competencies in Junior Schools in Webuye -East and Webuye -West sub counties. It was guided by the following objectives; assess the level of pedagogical content knowledge of teachers of mathematics, determine the relationship between teachers' Pedagogical Content Knowledge and learners' achievement of problem-Solving and critical thinking competencies, and to identify the contextual challenges in relation to pedagogical content knowledge. The study was guided by the Lev Vygotsky's Social Interaction Theory of learning. The target population were head of institutions, mathematics teachers, learners from the one hundred and forty-nine (149) Junior Schools in Webuye- East and Webuye- West sub counties. The total sample size was six hundred and ninety-three (693) respondents comprising three hundred and seventy-three (373) learners of grade 8, seven (7) Curriculum Support Officers (CSO), one hundred and seven (107) head of institutions, and two hundred and six (206) mathematics teachers. Census sampling was used to select all the seven (7) Curriculum Support Officers (CSO) and simple random sampling was used to select one hundred and seven (107) Head of Institutions, two hundred and six (206) mathematics teachers and three hundred and seventy-three (373) learners of Junior School. The study adopted a descriptive survey research design and utilized questionnaires, interviews, assessment test and a lesson observation schedule as instruments for data collection. The instruments were piloted to establish their validity and reliability. The study revealed that teachers in Webuye- East and Webuye-West sub-counties generally possessed a high level of PCK, as evidenced by high mean scores across various dimensions. A Pearson correlation analysis was conducted to examine the relationship between teachers' pedagogical content knowledge (PCK) and learners' problem-solving achievement and critical thinking. The results of the correlation analysis showed a moderate positive correlation between PCK and critical thinking ($r = 0.38, 95\%$ cl$[0.10, 0.60]$, $p = 0.015$), and a weaker but significant correlation with problem-solving skills ($r = 0.227$, cl$[0.10, 0.60]$, $p = 0.022$), hence rejecting the null hypotheses. This study however focused on only problem solving and critical thinking competences overlooking other competencies hence limiting generalization. The study revealed a number of contextual challenges which were categorized into resource shortage, infrastructure gaps and professional development gaps. Based on the findings the following recommendations are made; continuous retooling of teachers to acquire the relevant pedagogical skills to teach their various learning areas in line with the Competency Based Curriculum, teachers should enhance their PCK by adopting the learner centered approaches. The study findings would benefit the Ministry of Education (MOE) in planning for proper retooling of teachers to meet the required pedagogical competency and also teacher training colleges and universities to review their curriculum in the new learning areas to meet the needs of the schools.

Keywords: Teachers' pedagogical content knowledge, learners' competencies and mathematics

The Translation of Ngugi wa Thiong'o's Weep Not Child as Usilie Mpenzi Wangu: Does the End Justify the Means?

Emmanuel Kilatu
Department of Foreign Languages and Literature, University of Dodoma, Tanzania
Email: ekilatu274@yahoo.com
Mob: 0757-555514

Abstract

This paper discusses Ngugi wa Thiong'o's Weep *Not Child* (1981) and the title of its Kiswahili translation Usilie *Mpenzi Wangu* (2011). The objective of the study was to critically scrutinize the notion held in translation studies that the purpose determines the kind of a given translation to be made. The study purposively sampled the novel both in its original version and in its translated Kiswahili version. It was a library-based study whose data were collected through close reading of the novel in both English as a source language and Kiswahili language as a translation. The collected data were analyzed and presented as themes and quotations supplemented by secondary data availed through reading of dissertations, journals and other sources on translation and reviews and criticisms on the novel. With the Manipulation Theory as the literary lens, this paper argues that a translation that focuses only on purpose such as fetching a market for a translated literary text, may leave the readers feeling manipulated or cheated. By using André Lefevere's Manipulation Theory, which holds that translating a literary text is re-writing (Zhang, 2012); it argues that any literary work is not translated in vacuum, it is manipulated or re-written in a certain form for a certain reason. Given this proposition, the translator determines the way a certain translation should be, with a certain end, or purpose to achieve. Due to this leeway given to a translator, this paper further argues that, the translator may actually 'manipulate' the readers when it happens that the overriding focus of a given translation is, say, to exploit a market via the translated title of a literary text. In conclusion, the paper suggests that whatever the purpose of translating a literary text that leads to manipulation of a translation especially the title, should, much as it is possible, be a reflection of the subject matter as well as the thematic expressions embedded in a given literary text.

Keywords: translation, manipulation, re-writing, leeway

Understanding the Causal Symptomatic and Curative Factors of Suicide amongst Secondary School Students in the Western Region of Kenya

Christine Julie Nabwire
Department of Educational Psychology, Kibabii University

Abstract

This study examines the complex interplay of factors contributing to suicide among secondary school students in Western Kenya. Through comprehensive analysis of secondary data from national health surveys, educational records, and previous research studies, this paper investigates the causal factors, symptomatic manifestations, and potential interventions for addressing suicide risk among adolescents in Western Kenya's secondary schools. The findings reveal significant correlations between academic pressure, family dynamics, socioeconomic factors, and mental health challenges in contributing to suicidal ideation and behavior. The study provides evidence-based recommendations for educational institutions, healthcare providers, and policymakers to develop targeted interventions for this vulnerable population.

Keywords: adolescent suicide, secondary schools, mental health, Western Kenya

Innovate or Stagnate: The Crucial Role of Skill Development in Future Careers

Josephine M. Maingi
School of Education, Garissa University, Kenya
Maingi.jos12@gmail.com
Phone: +254 721 228 116

Abstract

In a rapidly evolving job market driven by technological advancements and shifting industry needs, professionals face a critical choice: innovate through continuous skill development or risk stagnation. The accelerating pace of automation, artificial intelligence, and digital transformation has disrupted traditional career pathways, making lifelong learning essential for career growth and job security. Despite widespread recognition of the importance of skill acquisition, there remains a gap in understanding how specific skill sets influence career progression across industries and career stages. Additionally, the effectiveness of different learning modalities, such as online courses, mentorship programs, and experiential training, remains underexplored. This study aims to examine the direct impact of continuous skill development on career success, adaptability, and professional growth. By identifying the key skills that drive career advancement, this research will provide valuable insights for individuals, organizations, and policymakers. Employing a quantitative research methodology, the study will collect data through structured surveys distributed to professionals at different career levels across diverse industries. Correlation and regression analyses will be used to determine relationships between skill acquisition, job performance, and career progression. The findings will highlight critical skills for career success and identify the most effective learning strategies. These insights will inform workforce development policies, helping organizations design targeted training programs and enabling educational institutions to align curricula with industry demands. By emphasizing the necessity of continuous learning, this study will contribute to policies that foster a resilient, adaptable workforce capable of thriving in the future job market.

Keywords: Skill Development, Career Growth, Workforce Innovation, Adaptability, Continuous Learning, Policy Development

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A Peek into the Language of Mathematics: Evidence from Undergraduate Secondary Education Students of Mathematics

Philip K. Mwei
Moi University
mweikip@mu.ac.ke
+254(0)723490906

Abstract

Education develops human capital. Teachers, especially, should possess the knowledge and skills to deliver on their mandates. Mathematics teaching is key to sustainable human capital development. Therefore, prospective mathematics teachers should demonstrate proficiency in the language of mathematics for learning and knowledge transfer. As a consequence, a study was conducted to evaluate Bachelor of Education students' mathematics understanding and use of specific mathematical terms ("prime number" and "parallelogram") as well as the two basic symbols (the "equal" and "plus" signs). The study involved 256 third-year first-semester students taking mathematics as one of their teaching subjects in secondary education. The study examined the definitions of these terms/symbols and students' ability to apply them in various contexts. A written open-ended mathematics test was administered. The results revealed mixed levels of comprehension across different concepts. All participants understood the basic meanings of the "equal" and "plus" signs; however, the majority did not recognize the broader applications of these concepts in mathematical reasoning. For instance, while a majority (66.8%) of students could identify that "=" denotes equivalence, they often failed to provide an example applying it correctly in relational thinking. Similarly, "+" was universally recognized as an operator for addition, but no students demonstrated usage in abstract algebraic expressions. In contrast, conceptual understanding varied significantly between the two mathematical terms studied. The majority (69.1%) accurately defined a "prime number," showcasing strong foundational knowledge in number theory. However, understanding geometric terminology proved weaker; 71.1% of students exhibited misconceptions or incomplete definitions regarding a "parallelogram." This disparity highlights potential gaps in geometry education compared to arithmetic-centred topics. These findings highlight the need for enhanced instructional strategies emphasizing relational symbol usage and comprehensive geometry education. Addressing these gaps could improve overall mathematical literacy among undergraduates, equipping them with a more robust conceptual framework for the workplace.

An Evaluation of School Practice and Mentorship in Higher Education Institutions

Julius K. Maiyo
School of Education, Department of Educational Planning & Management,
Kibabii University, Kenya
maiyojulius@kibu.ac.ke

Abstract

Teachers plays pivotal role in promoting Sustainable Development Goals of education and its contribution to the national development agenda. School Practice is one of the fundamental cornerstones for training quality teachers by most institutions of higher learning. The practice offers student-teachers the opportunity to put theory into practice as they are allocated classes to teach. The study focused on determining the effectiveness of the school practice and mentorship at higher education institution of learning. The study adopted the theory of change (ToC) which underlines the view that "if mentoring and support of teachers is done through the school practice model, the teachers' competence skills will be improved, effective teaching will be guaranteed, and student learning outcomes will be improved". Ultimately, improved teaching will result in improved quality of education at large. The study target population was all Third-Year Students Teachers (2024 Cohort) (1000) from Kibabii university, the Host School Advisors (300) and, Zonal Coordinators (14) and Advisors (65). Data collection was carried out using an online questionnaire distributed via Google Forms, ensuring ease of access and participation across the targeted groups and interviews also was conducted on advisors and host institutions representative. This study adopted the mixed design approach, which provides the opportunity of studying a phenomenon holistically in the way it is experienced by participants to get comprehensive findings regarding the use of mentorship during school practice in higher institutions of learning. Data was analyzed using both descriptive and inferential statistics and findings presented using tables, pie charts and graphs. The study revealed that majority of students (54%) disagreed with the notion that the assessment made them dislike teaching as a career, with an additional 37% strongly disagreeing with this sentiment. This suggests that most students were satisfied with their performance and the overall assessment process. The results also indicate a generally positive perception of the support provided by advisors on average, host advisors were impressed by the students' overall personal outcomes, with a mean score of 3.9764 (equivalent to 79.528% on a 5-point scale). This high mean score suggests that the majority of students demonstrated a commendable level of competency and professionalism at their host schools. The variability and range of scores (Min=1.00, Max=5.00, Std. Deviation= 1.05312). Study recommended that the institution to increase the availability and accessibility of teaching and learning materials and essential resources to students teachers. Regular communication and coordination from zonal coordinators, particularly in relation to assessments and logistical support is highly recommended. Institutions should implement a comprehensive briefing program that includes guidance on portfolio development, assessment expectations, and strategies for professional conduct during the teaching practice.

Keywords: Effectiveness, Mentorship, School Practice

Bridging the Digital Divide; the Influence of Teachers' Perception on Integration of Digital Technologies in Early Years of Education in Kenya

Otieno Violet Rose
votieno129@gmail.com
Mobile Number; 0725246284
Maseno University

Agen'go Ogony Maurice
agengomaurice@gmail.com
Mobile Number; 0727428087
Mount Kenya University

Abstract

One guiding principles of Kenyan Basic Education Act 2013 is that education should promote innovativeness, inventiveness creativity, technology transfer and an entrepreneurial culture among learners. The purpose of this study was to establish the influence of teachers',, perception on integration of digital technologies in early years of education in Kisumu Central Sub-County. The objective of the study was determine the influence of teachers' perception on integration of digital technologies hence bridging the digital divide in foundation phase learners. The study adopted Concurrent triangulation design within the mixed method approach. The study was anchored on Davis (1986) Technology Acceptance Model and Preparedness Theory by Seligman (1971). The study targeted 345 teachers from public primary schools in Kisumu Central Sub-County. The study adopted saturated sampling and stratified random sampling to sample 272 respondents. The data collection instruments were structured questionnaires, interview schedules and focus group discussion. Descriptive statistics, Pearson correlation and linear regression were used to analyze quantitative data. The Qualitative data was analyzed using Thematic Analysis Approach. The study findings indicated that that there is a statistically significant (n=202; r =.384; p < 0.05) positive correlation between teachers' perception and integration of digital technologies in early years of education. Teachers were also found to have positive perception towards integration of digital technologies in early years of education. The study concluded that teachers' perception is a predictor of integration of digital technologies in early years of education in Kenya. This means that the information on teachers' perception towards digital technologies is useful information in predicting the level of integration of digital technologies in early years of education. The study recommended that the ministry of education to consider organizing refresher courses for in-service teachers on integration of digital technologies. It was recommended that KICD to re –examine the curriculum content of pre-service teachers training.

Keywords; perception, teachers, digital technologies, integration, early years

Effective Communication for Inclusivity in Working towards the Attainment of Beta and Vision 2030

[1] Ernest Sangai Mohochi [2] Samuel Kairigo Wakahia

[1] Department of Kiswahili & other African Languages, Kibabii University, P.O. Box 1699-50200, Bungoma, Kenya

[2] Library Department, Kibabii University, P.O. Box 1699-50200, Bungoma, Kenya

Abstract

The purpose of this study is to explore the effectiveness of communication as an inclusivity strategy for the attainment of Beta and Vision 2030. The objectives are to assess the level of awareness of Beta and Vision 2030 agendas, to analyse the uptake levels of the Beta and Vision 2030 strategies among Kenyan Citizens and to propose better communication modalities that can enhance and bring on board citizen participation. A descriptive, cross-sectional survey shall be adopted for this study. An online questionnaire shall be used to collect data through a selected sample of respondents. Quantitative aspects of the data shall be analysed using SPSS while qualitative data shall be subjected to thematic analysis. The BETA and the Vision 2030 agendas are mainly written in English with minimal sensitization being conducted in other language actively. It is therefore expected that the levels of understanding of these two government agendas, especially when it comes to the common citizen is quite low. The result of this therefore is poor uptake among the citizens of the country. Furthermore, the research identifies barriers to effective communication and proposes solutions for overcoming them, such as leveraging technology, promoting multilingual communication, and fostering transparency. The findings emphasize that achieving Beta and Vision 2030 requires a communication framework that is inclusive, adaptable, and responsive to the needs of all individuals, ultimately leading to sustainable and equitable development.

Exploring Academic Challenges and its Role in High Undergraduate dropout rate in Kenyan Universities

Jane Nyanchama Nyakoe
Kibabii University, P.O. Box 1699-50200, Bungoma, Kenya
nyakoejayne@gmail.com, 0712829687

Abstract

This paper aim to examine how academic challenges contribute to the rising cases of undergraduate dropout in Kenyan Universities. This trend has led to a significant threat to the national goals of education, human capital development and the achievement of SDG goal number four on quality education. The study was guided by the following objectives; to establish how curriculum complexity, institutional support and resources availability influence the dropout rates in Kenya Universities. A descriptive survey design was adopted in the study. The target population for the study was made up of all public university undergraduate students and chair of departments from Kibabii, MMUST and Alupe universities. Stratified random sampling technique was adopted to come up with the sample. The sample size for the study was made up of 300 undergraduate students from different faculties and 36 chairs of department. Data was obtained through document analysis and self-administered questionnaire for students and chairs of departments. Quantitative data was analyzed using both descriptive and inferential statistics. The findings showed that complexity of academic programs, inadequate academic preparedness, insufficient mentorship programs and academic counseling and inadequate financial aid and scholarships compel students to drop out of the university. The study concluded that universities should put a lot of emphasis on designing curricula that take into consideration both complexity of the curriculum and practical learning approaches, reinforce institutional support to students through mental and academic mentorship, and implementation of work-study programmes to assist financially disadvantaged students. The study recommends an increase in private and government sector funding, financial aid programs, curriculum redesigning and effecting student support programmes to address mental health issues and academic mentorship to improve retention rates.

Keywords: *Curriculum Complexity, Dropout Rate, Institutional Support, Resources Availability, Retention Rate*

Impact of financial management skills of Head-teachers on Competency Based Curriculum implementation in Junior schools in Bungoma South Sub-county

Wechuli Simiyu Christopher
Kibabii University, P. O. Box 1699-50200, Bungoma, Kenya
simiyuchris26@gmail.com, +254701861395

Abstract

The aim of this paper is to examine how financial management skills of head teachers impact the management of finances, a key aspect in implementing the Competency Based Curriculum in junior schools. Domiciling junior school in primary schools has expanded the financial responsibilities of head-teachers. The allocation of relatively high amounts of funds and the rising demand for resources in junior schools pose great challenges to head-teachers with limited knowledge on financial management. Despite training head-teachers and account clerks on school financial management, gaps remain in procedures and reporting on the use of finances in junior schools. The study was guided by objectives to establish how head-teachers' financial planning skills, procurement skills, and financial reporting skills impact on the acquisition of resources necessary for Competency Based Curriculum implementation. The study used a mixed approach design and targeted 93 public primary schools' head-teachers, 93 accounts clerks, and 4 schools' auditors. A simple random sampling technique was used to select the schools, while purposive sampling targeted specific respondents. The sample included 50 head-teachers, 50 accounts clerks, and 1 school auditor. Data collection involved self-administered questionnaires for head-teachers and accounts clerks, and document analysis for the school's auditor. Qualitative data was analyzed thematically to identify skills and knowledge gaps in financial management, while quantitative data was analyzed using SPSS. Findings were presented using pie charts, tables, and graphs, showing that insufficient knowledge on financial planning, budgeting, reporting, and policy regulations leads to mismanagement and misappropriation of funds. The study concluded that training head-teachers and accounts clerks would boost their understanding of resource mobilization, planning, budgeting, and reporting with adherence to policy guidelines. It recommends increased funding for junior schools and continuous training on financial management to ensure prudent use of funds for successful CBC implementation.

Keywords: *Financial management, planning, Vote head, procurement, financial reporting, Competency Based Curriculum, Junior school*

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Infrastructure as a Service for Sustainable Learning Management System in Public Universities in Kenya

Enson Yegon, Richard Rono, Yonah Etene,

Abstract

Public universities in Kenya faces significant challenges in Learning Management Systems (LMS) when hosted onsite without backup systems due to system downtime, security vulnerabilities, high operational costs, and limited scalability. The purpose of the study was to assesses the onsite LMS performance and cloud LMS and impact of onsite LMS on users, with particular focus on how cloud Infrastructure as a Service (IaaS) can enhance LMS sustainability. .A case study design were used where KIbabii University was selected as target population, this is because it has already implemented both cloud-based and onsite LMS platforms, the research analyzed data from 310 respondents comprising 275 students, 25 lecturers, and 10 ICT staff. The study employed both quantitative and inferential analysis, the statistical analysis tool used was SPSS. Results revealed a significant positive correlation ($r = 0.272$, $p < 0.01$) between LMS performance and sustainability. The findings indicate that majority of users experienced frequent downtime with onsite systems, while majority also views that it requires 3-24 hours for system restoration during downtime. In contrast, cloud-based LMS demonstrated key features supporting LMS sustainability including scalability, cost-effectiveness, security, high performance and reliability. Cloud IaaS significantly improves LMS sustainability through enhanced performance, reduced downtime, improved scalability, and better resource optimization, making it a viable solution for sustainable educational technology in resource-constrained public institutions. Furthermore, the study recommends cloud-based solutions to address infrastructure limitations and enhance system sustainability in public universities.

Keywords: *Cloud Infrastructure as a Service, Learning Management Systems, Sustainability, Public Universities, Educational Technology, System Performance, Cloud Computing*

Building 21st-Century Workplace Skills: Bridging Education and Industry

Sarah Likoko [1], Domitila Atitwa[2], David Khamala Wafula[3]
School of Education, Department of Educational Planning and Management,
Kibabii University, Kenya
Corresponding Email: domitilaatitwa12@gmail.com

Abstract

The article examines the growing challenges of the skills gap in Kenya's workforce amid ongoing economic growth and development. It highlights that traditional educational systems, particularly the 8-4-4 curriculum, which emphasizes theoretical knowledge, often do not equip students with the practical skills needed by employers. To address this issue, the study advocates for comprehensive pedagogical and curriculum reforms that include digital literacy, integrated vocational training, and the adoption of competency-based curricula (CBC). The research underscores the importance of a collaborative approach involving educational institutions, government bodies, and the private sector to develop adaptable curricula aligned with evolving labour market demands. It also explores innovative teaching methods such as project-based learning, experiential learning, and the integration of technology in classrooms, which can enhance skill development relevant to the workforce. Furthermore, the article draws on both domestic and international trends to suggest strategies for educators and policymakers to reform Kenya's educational system. The goal is to ensure graduates are better prepared for employment, thereby supporting sustained economic growth and improved employability. Ultimately, the study emphasizes that deliberate changes in educational paradigms are essential for closing the skills gap and maintaining Kenya's development trajectory.

Keywords: Bridging, Education, Industry, Skills Gap, Workplace

The Impact of Emerging Oppressive Social Conditions on Women in the 21st Century in Tsitsi Dangarembga's Trilogy

Everlyne N. Achieng[1*,] Christine Namayi [2], Ben Nyongesa [3]
1. Kibabii University, P.O. BOX 1699-50200; Bungoma, Kenya
2. Kibabii University, P.O. BOX 1699-50200; Bungoma, Kenya; namayichristine@gmail.com
3. Kibabii University, P.O. BOX 1699-50200; Bungoma, Kenya; bnyongesa@kibu.ac.ke
*Corresponding author Achiengeverlyne93@gmail.com, namayichristine@gmail.com, bnyongesa@kibu.ac.ke

Abstract

According to Dangarembga's first trilogy, there is an observed trail of social conditions that oppress women besides the emerging social conditions which need to be addressed and unless this oppression of women is studied in its trend, pertinent issues of concern may be left out. This would mean that women will continue to suffer under their oppressors if they aren't given a voice to speak with. This paper aimed at analysing the impact of the oppressive social conditions on women in Tsitsi Dangarembga's first trilogy; Nervous Conditions (1988), The Book of Not (2006) and This Mournable Body (2018). The study employed Postcolonial Feminist Theory on double colonization and the subaltern and New Historicism theories. The study adopted a qualitative research design. The three texts were purposively sampled as they are a trilogy hence better placed to show the influence of the author's ideology on the choice of the feminist aesthetic strategy used in the trilogy. A textual exegesis was conducted from close reading and content analysis as the method of data collection and analysis. Primary texts were subjected to close reading to provide data for analysis. The paper also referred to secondary sources to collect data that supported the arguments. The paper established that the female characters in the trilogy have been impacted in various ways by the oppressive social conditions that they encounter such as segregation, commodification of the female body and trauma, stigma and alienation. The findings of the study may be appropriated for comparative literary studies that would enable the development of the appropriate approaches and theories to women emancipation and creation of an all-inclusive gender system. Additionally, the literary scholars may use this knowledge in working towards developing appropriate feminist theories, approaches and models in analysis of such works.

Keywords: Impact, emerging, oppressive social conditions, 21st Century

Gender Representation in Luhya Popular Songs: A Case of Jacob Luseno, Kennedy Khaemba and Opete Wa Musungu

Christopher Matete Wechuli

Masinde Muliro University of Science and Technology,

Email address: meetchris88@gmail.com 0715137379

Abstract

This paper examines the selected Luhya popular songs of Jacob Luseno, Kennedy Khaemba and Opete wa Musungu with a view to explore the gender issues on women in the Isukha, Bukusu and Tachoni societies. The impetus of this study was borne out of the realization that popular songs whose medium of communication is music have become an important avenue for social communication as a form of text. This study was guided by the research question: How do the popular songs of Jacob Luseno, Kennedy Khaemba and Opete wa Musungu reveal the gender roles and stereotypes in the Isukha, Bukusu and Tachoni societies? Dennis Tedlock and Dell Hymes views on Ethnopoetics and Naoomi Nkaelah's view of feminist literary criticism were useful for conceptual analysis and interpretation of the texts. Feminist literary criticism helped us to understand how women are portrayed in their roles and imagined beliefs in the selected Luhya songs while Ethnopoetics helped us to actualize the seleted oral songs into a written text and in unraveling the meaning and mood in the selected songs. Critical analysis of the songs and mixed method research that uses a sequential exploratory design was useful in collecting data. Purposive sampling was useful in selecting songs that were taken as cultural texts that depict women in their gender roles and stereotypes. The findings of this study show that Luhya popular songs reveal societal gender issues on women. This study shall shed light on the societal attitudes towards women in the Isukha, Bukusu and Tachoni societies that these artists come from. This study will help literary scholars, gender activists and musicians to delve further in gender dynamics of communities and improve their areas of concern especially in relation to the entire Luhya community.

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Beyond Academic Guidance: Exploring the Multifaceted Nature of Supervisor Support in Doctoral Education

Patrick Owoche
Kibabii University, P.O. BOX 1699-50200; Bungoma, Kenya
powoche@kibu.ac.ke

Abstract

The study investigated the multifaceted nature of supervisor support in doctoral education within Kenyan universities, emphasizing the influence of supervisor-student relationships on student satisfaction and motivation. The research employed a survey-based methodology, utilizing descriptive and inferential statistics to analyze the impact of supervisor availability, guidance, communication, and feedback on overall satisfaction. The findings underscored the critical role of open communication and constructive feedback in fostering a positive supervisory experience, aligning with Social Support Theory and Expectancy Theory of Motivation. The study also highlighted the nuanced relationship between supervisor guidance and student satisfaction, suggesting the need for a balance between support and autonomy. The research concludes by offering practical recommendations for enhancing supervisor support and improving the doctoral experience in Kenyan universities, while acknowledging the limitations of the study and suggesting avenues for future research. The study offers practical recommendations for enhancing doctoral supervision practices in Kenya, promoting a more positive and productive doctoral experience.

Keywords: Doctoral Supervision, Supervisor Support, Doctoral Students, Social Support Theory, Expectancy Theory of Motivation, Regression Analysis, Academic Satisfaction.

Christianity and Multi-Party Democracy in Kenya: Church Leaders' Role in Democratic Transitions (1990-2002)

Margaret Nanjala Matisi
Department of Social Sciences, Kibabii University

Abstract

This study examines the crucial role of Christian church leaders in Kenya's transition to multi-party democracy between 1990 and 2002, a period marked by significant political transformation and civil society activism. Despite facing state repression, prominent religious figures emerged as key advocates for democratic reforms, using their moral authority and institutional platforms to challenge the one-party state. Drawing on extensive archival research, including previously unexplored church documents, newspaper records, and oral histories from surviving church leaders, this study analyzes how religious leaders developed theological frameworks for democracy while mobilizing grassroots resistance to authoritarian rule. The research demonstrates that church leaders employed three key strategies in fostering democratic transition: articulating a Christian theological basis for democratic governance, utilizing church networks to create protected spaces for pro-democracy organizing, and leveraging their moral authority and international connections to pressure the regime for political reforms. Analysis reveals that churches with strong leadership and clear theological frameworks achieved significant success in mobilizing their congregations and influencing national politics. The findings indicate that religious leaders' effectiveness stemmed from their unique position as moral authorities with extensive institutional networks. Their ability to frame political demands in religious terms provided protection from state repression while maintaining legitimacy with their congregations. The study concludes that church leaders made substantial contributions to Kenya's democratization, suggesting that religious institutions can serve as crucial incubators for democratic movements where secular opposition faces restrictions.

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Curriculum Development and Innovation for the 21st Century: Legal Considerations and Challenges

Domitila Atitwa[1], Wanyonyi Wanjala [2], Sarah Likoko [3]
School of Education, Department of Educational Planning and Management,
Kibabii University, Kenya
Corresponding Email: domitilaatitwa12@gmail.com

Abstract

This study explores the relationship between innovation and curriculum development in Kenya, focusing on how legal frameworks and implementation challenges influence the adoption of new educational models. In response to evolving global educational demands, Kenya has undertaken significant curriculum reforms, notably the introduction of the Competency-Based Curriculum (CBC), aimed at enhancing education quality and ensuring relevance to current societal needs. The research examines the legal structures such as national policies, laws, and regulations that shape curriculum design and execution. It highlights how these frameworks serve both as enablers and barriers to innovation, affecting how educators and institutions adapt to new models. The study also discusses common obstacles faced during implementation, including maintaining conformity with national standards, managing resource constraints, and providing effective teacher training. Furthermore, the study considers socio-political factors like cultural attitudes and political will, which can either facilitate or hinder reform processes. Through a comprehensive review of literature, policy documents, and case studies, the research identifies key challenges and proposes strategies for overcoming them. Ultimately, the findings underscore the necessity of aligning legislative frameworks with the goals of curriculum innovation. Strengthening this connection is crucial for ensuring the successful, sustainable integration of innovative educational models in Kenya's system, thereby improving educational outcomes and responsiveness to societal needs.

Keywords: Challenges, Curriculum Development, Innovation, Legal Considerations

Leveraging Research Partnerships for Sustainable Innovation and Societal Impact

Immaculate Amusugut[1], Agnetta Bifwoli [3], Sarah Likoko [3]
School of Education, Department of Educational Planning and Management,
Kibabii University, Kenya
Corresponding Email: amsuemmah@gmail.com

Abstract
Artificial Intelligence (AI) is revolutionizing public health surveillance. In Africa, where health systems frequently encounter failed health information systems. This paper aims at leveraging AI in mathematical modelling of malaria vaccines impact that will incorporate epidemiological data from local surveillance to simulate malaria transmission dynamics on basic reproduction number R_0 on vaccination scenarios in order to predict the reduction in malaria incidence. The BNNs model algorithms and computational pipelines created for leverage genomic data and immune system interactions of AI predictive power algorithms for pathogenic epitopes, assess immunogenicity and prioritize antigens for experimentation with optimal safety and efficacy profiles in which data heterogeneity, model interpretability and regulatory considerations will be addressed to realize the full potential of AI in malaria vaccine impact. Therefore, integrating AI will enhance understanding of malaria vaccine design precision and scalability to accelerate the delivery of safe and effective malaria vaccines in health sector.

Keywords: *Leveraging, (AI) Artificial Intelligence, Basic reproduction number (R_0), Efficacy and immunogenicity*

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Justice in the Face of Language Diversity: The Interpretation Paradox

Irene Kimani[1]
Laikipia University, Kenya
Inkimani2014@gmail.com

Henry Nandelenga[2]
Kibabii University, Kenya
khwamu@gmail.com

Felicia Yieke[3]
Laikipia University, Kenya
fyieke@laikipia.ac.ke

Abstract

Globally, interpretation in the courtroom continues to draw the attention of researchers owing to its significance in the enhancement of justice for lay litigants. Many multilingual countries in Africa have to contend with the array of interpretation needs while safeguarding and upholding the rights of lay litigants amidst cultural differences and accuracy needs in the courtroom. Like many multilingual African Countries, Kenya lacks standards in interpretation which could potentially lead to miscarriage of justice. Article 50 of the Constitution of Kenya 2010 embodies the right of accused persons to be assigned an interpreter by the court. In addition, the Kenya Sign Language Bill, 2021 aims at inclusion of sign language in legal proceedings, Education and for connectedness. This study sought to explore the accuracy of source language interpretation in Kenya's Justice System. Anchored on Relevance Theory and Conversational Analysis, the study took a pragmatic approach to interpretation as witness testimonies and evidence in the legal space is largely contextual. Data was collected from the High Court in Kenya using triangulation method which comprised of 10 hours of audio data, note taking, observation and interviewing. It was coded and then analyzed thematically to reveal aspects of accuracy as set out in the study. The target population comprised of judicial officers, interpreters and lay litigants. The findings indicate that inaccuracy occasioned by omissions, unnecessary additions, pronunciation, grammatical errors and changes in word order are some of the major issues in the courtroom. In addition, cultural differences are a source of inaccuracy particularly in sexual offences where it is taboo to mention some words. To enhance the accuracy of courtroom interpretation, a multi-faceted approach is recommended which may include training programs in interpretation to professionalize the practice. These findings are beneficial to the Judiciary, policy makers, forensic linguists and relevant government organs that are charged with the duty of protecting the rights of lay litigants. Further research could be conducted on interpretation in litigation involving minors to reveal any potential bias.

Keywords: Justice, Interpretation, Language Diversity

Kenyan University Dropouts: Trends and Challenges

Wechuli Simiyu Christopher[1] & Likoko Sarah [2]
School of Education, Department of Educational Planning & Management,
Kibabii University, Kenya
simiyuchris26@gmail.com, https://orcid.org/0000-0002-1084-1618
slikoko@kibu.ac.ke, https://orcid.org/0000-0002-7483-437X

Abstract

University dropouts are a global issue impacting individuals, Universities, and society, with a range trends and challenges to the rising cases of undergraduate dropout in Kenyan Universities. This trend has led to a significant threat to the national goals of education, human capital development and the achievement of SDG goal number four on quality education. The study was guided by the following objectives; to establish how curriculum complexity, institutional support and resources availability influence the dropout rates in Kenya Universities. A descriptive survey design was adopted in the study. The sample size for the study was made up of 300 undergraduate students and 36 chairs of departments. Data was obtained through document analysis and self-administered questionnaire for students and chairs of departments. Quantitative data was analyzed using both descriptive and inferential statistics. The findings showed that complexity of academic programs, inadequate academic preparedness, insufficient mentorship programs and academic counseling and inadequate financial aid and scholarships compel students to drop out of the university. The study concluded that universities should put a lot of emphasis on designing curricula that take into consideration both complexity of the curriculum and practical learning approaches, reinforce institutional support to students through mental and academic mentorship, and implementation of work-study programmes to assist financially disadvantaged students. The study recommends an increase in private and government sector funding, financial aid programs, curriculum redesigning and effecting student support programmes to address mental health issues and academic mentorship to improve retention rates.

Keywords: Curriculum Complexity, Dropout Rate, Institutional Support, Resources

The 21st century pedagogies: Novel or metempsychosis?

Joab Namai
Daystar University
jnamai@daystar.ac.ke
+254722292277

Abstract:
It has been estimated that around 69 million new jobs will be created by the year 2027. Such rapid changes would doubtlessly put demands on teachers to ensure that learners are effectively prepared to respond to these emerging and constantly evolving work environments. In the recent past, significant emphasis has been mounted regarding the place of the 21st century skills in current and future pedagogies. Teachers and indeed educators as a whole have been encouraged to embrace these skills as they have the capacity to prepare learners for the world of work. All learners must be equipped with holistic education that emphasizes on critical life skills. As critical as this is, it is important to position this discourse so that it does not seem foreign to the stakeholders. It is important to see these skills as homegrown, instead of foreign. This paper seeks to articulate the notion, through survey and synthesizing of existing literature, that the 21st century pedagogies may actually be a product of metempsychosis and not so much novel, as to scare unsuspecting neophytes in the pedagogical landscape. The paper begins by discussing the critical tenets of the 21st century skills. It later goes further to draw a parallel between the 21st century pedagogies and some of the ancient approaches adopted in the informal pedagogical experiences. It concludes with highlighting some of the challenges in adopting these 21st century skills and how these can be ameliorated. This information will be important in helping educators to easily relate with these skills so as to effectively adopt and inculcate them among the learners.

Curriculum Support Officers' Professional Practices and Quality Teaching in Public Day Secondary Schools in Kakamega County, Kenya

Lubanga Henry Akolo, Kipkenei Simon, Wafula Robert
Kibabii University, Kenya
Hlubanga96@gmail.com

Aabstract

Quality of education is an outcome of various inputs and processes .Curriculum support officer enhances teachers' productivity, brings about desired outputs and facilitates the realization of educational goals as stated in the National Policy on Education. The objectives of this study were to; ascertain the influence of curriculum support officers' role in learner assessment on quality teaching in public day secondary schools in the County, determine the influence of curriculum support officers' capacity building of teachers on quality teaching in public day secondary schools in the County. The study was guided by the Coaching theory. The study used ex-post facto research design to explain the existing phenomena. Target population comprised of 5207 teachers and 425 school Principals from 425 public day secondary schools and 37 CSOs in Kakamega County. Purposive and random sampling was used to select 13 CSOs selected from 13 Sub Counties, 52 Principals and 521 teachers were selected from 52 public day secondary schools respectively. The information was gathered using an interview schedule and a closed-ended questionnaire with a Likert type scale of 1 to 5. Data were analyzed using percentages, means, standard deviations and correlations and linear regressions. The quality teaching in public day secondary schools was low indicating an overall school mean scores for KCSE in five years at 3.912 (D+). It was revealed that the CSOs provided little support to teachers to understand assessment procedures and rarely organized INSETS in their subject areas. The study concluded that the CSOs provided inadequate support to teachers that explained low quality teaching as measured in KCSE mean scores.

Keywords: *Curruculum Implementation, CSOs' Professional Practices, Quality teaching and learning*

The Effectiveness of AI -powered Tools on Students Learning Outcomes

Khaemba Lorna Nanjala & Simon Kipkenei
Kibabii University
khaembalorna@gmail.com

Abstract

The present decade has seen a rise in the use of Artificial Intelligence (AI). The utilization of AI has become popular in different sectors including education. These AI tools have several advantages such as personalized learning, instant feedback and automated learning which could enhance learning outcomes. However, concerns have been raised over the effectiveness of these AI tools on student learning outcomes. The purpose of this study is to assess the effectiveness of AI-powered homework tools on student learning outcomes. The objective of the study was to investigate how AI- powered homework tools affect a learner's academic performance. To guide this research, Cognitive Load Theory (CLT) by John Sweller was applied. The theory explains how the brain processes and stores information. Sweller suggests that the brain's long-term memory is unlimited but the working memory is limited. Thus, it is important that learning is structured effectively by breaking down complex concepts or removing unnecessary information. This study is done on existing research papers and scholarly articles using descriptive research design. 50 articles were found on the topic and from these a sample of 30% was used. Sources suggest that while AI tools can positively affect students' academic performance, care should be taken to avoid overreliance. These findings will contribute to the ongoing discourse on the use of AI in learning, thus, giving insights to policymakers, teachers and educators on how best to enforce the use of AI in a school environment.

Keywords: Artificial Intelligence, AI-powered homework tools, AI in education, AI and academic performance.

Bridging Education Gaps: Inclusive Education for Marginalized and Rural Communities in Kenya

Wanjala Reuben Samuel[1], Eusebius Barasa Ngera[2], Jane Barasa[3]
Department of Education Planning & Management, Kibabii University Bungoma, Kenya
1&2: PhD Students Department of Education Planning and Management Kibabii University
3: Lecture Department of Education Planning and Management Kibabii University
ngeraeusebius@gmail.com/Samuel.reuben82@gmail.com/jbarasa@kibu.ac.ke

Abstract

Education is a critical driver for sustainable development. Kenya, as a developing nation, faces significant challenges in providing inclusive education, particularly for marginalized and rural communities. Despite the government's efforts to improve access to education, substantial gaps persist, especially in rural and underserved areas. Children in these communities are hindered by factors such as poverty, cultural norms, a shortage of qualified teachers, and inadequate infrastructure. Education is a critical driver of sustainable development, yet many rural and vulnerable populations continue to struggle in accessing quality learning opportunities. This article explores innovative strategies and legislative measures aimed at promoting inclusive education for marginalized groups. It emphasizes the role of technology, community-based initiatives, and government support in overcoming challenges like poor infrastructure, teacher shortages, and socioeconomic barriers. The paper also highlights best practices from successful inclusive education programs to demonstrate how equal learning opportunities can be created. Ultimately, this work advocates for multi-sectoral collaboration to ensure that no learner is left behind in the pursuit of human capital development.

Keywords: Bridging, Education Gaps, Inclusive Education, Marginalized, Rural Communities

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Transforming Education through ICT4D: An Empirical Review on Digital Tools and Innovative Learning Solutions

[1] Paul Oduor Oyile and [2] Alice Nambiro
[1] poyile@kibu.ac.ke and [2] anambiro@kibu.ac.ke
1,2 School of Computing and Informatics, Kibabii University, Kenya

Abstract

This paper presents an empirical review of the transformative potential of Information and Communication Technologies for Development (ICT4D) in the education sector. It explores how digital tools and innovative learning solutions are reshaping the educational landscape, particularly in developing countries, by enhancing access, quality, and equity in education. The review draws upon recent empirical studies, case studies, and policy reports published between 2020 and 2023 to provide an up-to-date analysis of the opportunities, challenges, and best practices in leveraging ICT4D for educational transformation. The findings highlight the significant progress made in the adoption and integration of digital technologies in education, such as mobile learning, online platforms, and educational software. However, the review also reveals persistent challenges, including the digital divide, infrastructure limitations, and the need for teacher training and support. The paper concludes by proposing a framework for harnessing the transformative power of ICT4D in education, emphasizing the importance of context-specific approaches, multi-stakeholder collaboration, and a focus on sustainability and scalability.

Keywords: ICT4D, education, digital tools, innovative learning solutions, educational transformation.

The Impact of AI and Machine Learning Advancements on Societal Transformation and Industry Efficiency: A Systematic Review of Emerging Trends

Jeremiah Onunga
Department of Renewable Energy and Technology, Turkana University College
jerryosida@mail.com

Abstract

The rapid evolution of artificial intelligence and machine learning has ushered in transformative changes across societies and industries, redefining operational efficiencies and societal norms. This systematic review explores the profound impact of artificial intelligence and machine learning advancements, emphasizing their role in driving innovation, enhancing productivity, and reshaping human interaction with technology. The importance of this topic lies in its broad implications, artificial intelligence and machine learning not only optimize industrial processes but also influence socio-economic structures, workforce dynamics, and ethical frameworks. Despite extensive research, a gap persists in comprehensively understanding how these technologies synergistically affect both societal transformation and industry efficiency, particularly with emerging trends like generative AI and autonomous systems. The primary objective of this study is to synthesize current literature to identify key trends, assess their implications, and highlight underexplored areas. A systematic review methodology was employed, involving a structured analysis of peer-reviewed articles, industry reports, and case studies published between 2018 and 2025. Databases such as IEEE Xplore, PubMed, and Scopus were searched using keywords like artificial intelligence and machine learning advancements, machine learning trends, and societal impact." Inclusion criteria focused on studies addressing both societal and industrial dimensions. The findings reveal that artificial intelligence and machine learning significantly enhance industry efficiency through automation, predictive analytics, and resource optimization, with sectors like healthcare, manufacturing, and logistics showing up to 30% productivity gains. Societally, these technologies foster improved education and healthcare access but raise concerns over job displacement and privacy. Emerging trends, such as AI-driven decision-making and real-time data processing, amplify these effects. Implications suggest a dual-edged impact of efficiency and innovation soar while ethical and regulatory challenges intensify, necessitating adaptive policies. This review underscores the need for interdisciplinary research to balance technological progress with societal well-being, offering a foundation for future studies to address these evolving dynamics.

Keywords: *Artificial Intelligence (AI), Machine Learning (ML), Societal Transformation, Industry Efficiency, Emerging Trends, Automation*

The Evolving Role of Global Information Technology Infrastructure in Addressing Borderless Challenges: A Critical Review (1900-2024)

Paul Oduor Oyile [1], *Dennis Gichuki* [2], *Samuel Mbugua* [3]
poyile@kibu.ac.ke[1], *gichuki@kibu.ac.ke* [2], *smbugua@kibu.ac.ke*[3]
1,2,3 School of Computing and Informatics, Kibabii University, Kenya

Abstract

This paper critically examines the evolving role of global information technology (IT) infrastructure in addressing borderless challenges from the early 20th century to the present (2024). Utilizing a systematic review methodology, the study applied clear inclusion criteria, focusing on peer-reviewed literature, policy reports, and case studies published between 1900 and 2024. An analytic framework was used to trace the chronological development and applications of IT across key global issues, such as environmental degradation, overpopulation, and refugee movements. Specific examples underscore the transformative impact of various technologies over time: the use of radio communication during early humanitarian efforts; satellite imaging for environmental monitoring from the mid-20th century; and, more recently, internet and mobile platforms during refugee crises to enable real-time coordination and aid distribution. Big data analytics and artificial intelligence (AI) are also highlighted for their potential in predicting risks and optimizing global responses. Despite the promise of IT, the review identifies critical limitations in the literature, including gaps in research on the long-term social impacts of algorithmic decision-making, uneven global access due to the digital divide, and ethical concerns around data privacy and AI bias. Addressing these gaps requires international collaboration, investment in inclusive digital infrastructure, and the promotion of open-source and responsible innovation. This review offers valuable insights for policymakers, researchers, and global stakeholders committed to harnessing IT to confront complex, borderless challenges and to foster a more interconnected, equitable, and sustainable future.

Keywords: Global Challenges, Information Technology Infrastructure, Sustainable Development, Digital Divide

Active student Learning Agency as a Transformative factor in Kenyan science classrooms

Selline Ooko[1], Festus Kelonye Beru[2], Samson Madera Nashon[3], David Anderson[3], Elizabeth Namazzi[4,]
[1]Masinde Muliro University, Kenya
[2]Kibabii University, Kenya
[3]University of British Columbia, Canada
[4]Uganda Martyrs University, Uganda
* Corresponding Author's email: fberu@kibu.ac.ke

Abstract

In recent years, discourse on effective science education has increasingly highlighted the role of student agency in shaping learning outcomes. This shift from traditional, teacher-centred instruction to more learner-driven pedagogies emphasizes students as active participants in their educational journeys. In Kenya, educational reforms such as the Competency-Based Curriculum (CBC) underscore the urgency of understanding how student agency operates within science classrooms. Pedagogy in Kenyan science education is shaped by complex social, cultural, and institutional factors. Amid resource disparities and varied teacher preparedness, instruction often becomes a negotiation between curriculum mandates, teacher expectations, and student engagement. Within this dynamic context, student agency—defined as the capacity to make choices, express opinions, and take ownership of learning—holds transformative potential. This study investigated how pedagogical practices in selected Kenyan classrooms both shape and are shaped by student agency. It examined how science teachers responded to student curiosity, participation, and initiative, and how these interactions influenced their instructional choices. Drawing on a teacher change framework that attributes agency to student learning, an interpretive, descriptive study was conducted one year after teachers implemented a contextualized science curriculum unit which involved 80 students from two select national schools(1 boys, and 1 one girls). In-depth interviews were conducted with 6 form 3 (grade 11) teachers of science subjects (maths, biology, physics and chemistry. Findings revealed key pedagogical transformations: teachers increasingly related science to real-life contexts, critically evaluated instructional approaches, redefined their locus of control, integrated collaborative methods, and reconsidered their attitudes toward science subjects.

Keywords: Student-agency, Science-education, Pedagogical-practices, Teacher-change, Learner-centered instruction

Leveraging Artificial Intelligence (AI) in Education: A Case Study of Kibabii University

Boniface Wakholi & Jane Barasa
bwakholi@kibu.ac.ke; jbarasa@kibu.ac.ke

Abstract

Artificial Intelligence (AI) has become a transformative force in global education systems, offering new pathways for enhancing learning outcomes and teaching methodologies. However, its integration into university-level education, particularly in the Kenyan context, remains underexplored. This study investigates the adoption and impact of AI-based tools at Kibabii University, with the objective of assessing how AI influences students' academic performance. Data were collected through structured questionnaires administered to a sample of 314 students and 50 lecturers, followed by both qualitative and quantitative analysis using regression and ANOVA techniques. The regression analysis revealed a strong positive correlation ($R^2 = 0.78$) between AI adoption and improved academic performance. Additionally, 65% of students and 72% of lecturers reported using AI-powered educational tools, especially within the Learning Management System and research support tools. Cross-tabulation results showed variations in adoption across academic disciplines, with students in sciences reporting the highest usage (71.4%), followed by those in business (62.5%) and arts (57.4%). ANOVA results confirmed that these differences were statistically significant ($F = 14.23$, $p < 0.000$). These findings support the conclusion that AI adoption significantly enhances academic performance. We recommend the development of institutional policies and digital infrastructure to support the broader implementation of AI in higher education.

Keywords: *Artificial Intelligence, Education, Digital Transformation, ICT, Regression Analysis, Learning Management System*

Effects of Communication in an Authoritarian Parenting Model on Learner Participation in Early Childhood Education Environmental Class in Kabondo Division, Homabay County

Onyango Daughty Akinyi
onyangodotty@gmail.com; onyangodotty@gmail.com
0722936737

Abstract

The study investigated the effects of communication in an authoritarian parenting model on learner participation in early childhood education (ECE) environmental class. The research objectives were to assess the effects of expressiveness, social withdrawal, learner anti-social behavior and emotional balance on participation in an environmental class. The study involved a descriptive survey research design. The study target population was 1,055 respondents which was large hence a 30% sample size according to Kothari & Gaurav (2015) was employed. A multi stage sampling technique of simple random, saturated and purposive sampling was used to get a total sample size of 314. All the data was gathered, summarized and analyzed by reading the information collected through the research instruments and then, pattern trends and relationships from the information gathered were established. Descriptive statistics were used to analyze qualitative data. Quantitative statistics were used to match authoritarian parenting numbers to learner participation attributes. Frequency distribution tables were used to present the data. The study found out that 91% of the ECE teachers confirmed that learners from Authoritarian Parenting homes could not express themselves well as a result of limited communication existing between the children and the parents and only 9% observed eloquence. Correlation analyses were performed to determine which demographic characteristics should be used as control variables. Regression analyses were also performed to examine the relationship between authoritarian parenting model and children's classroom participation. The findings of the current study did support the researcher's assumption that authoritarian parenting model was negatively related to children's participation in class. For further research it was suggested that since authoritarian mothers and fathers behave differently, studies should be done separately to assess the consistency of the style in both parents.

Bridging Theory and Practice in STEM Teacher Education: Evaluating the Impact of Pedagogy Training and Micro-teaching on Pre-service Science Teachers' Classroom Readiness

Rose Atieno Mutende
Kibabii University
rmutende@kibu.ac.ke
0724400442

Abstract

Teacher preparation is crucial for improving STEM education quality, particularly in low-resourced settings like Kenya, where educational disparities hinder learning outcomes. This study investigates the impact of STEM pedagogy training and microteaching on the classroom readiness of 186 preservice science teachers at Kibabii University. The study aims to bridge educational gaps by evaluating the effectiveness of structured teacher education in equipping students with practical teaching skills. Third-year B.Ed. science students who had completed coursework and teaching practice participated in this mixed-methods study. Data were collected using structured questionnaires, interviews, and observation checklists, providing a comprehensive view of participants' experiences. The results revealed that although students appreciated the theoretical grounding in STEM pedagogies, they faced challenges in applying these strategies in real classroom contexts due to resource limitations and rigid instructional practices. Microteaching was identified as a vital transitional experience, boosting teaching confidence and facilitating the effective use of various pedagogical strategies. The study emphasizes the importance of aligning teacher education curricula with classroom realities and recommends integrating technology-enhanced resources like simulations. Future reforms should focus on providing better mentorship support during school practice and incorporating contemporary pedagogical strategies to enrich the learning experience.

Keywords: *STEM pedagogy, preservice science teachers, microteaching, teacher preparation, school practice*

Enhancing Inclusive Education in Kenyan Public Primary Schools through the Integration of Special Needs Training in Teacher Professional Development

Sarah Looniyo[1], Manasi Echaune[2] and Julius Maiyo[3]
[1] Doctoral Student Department of Educational Planning and Management- Kibabii University
[2] Senior Lecturer – Department f Educational Planning and Management- Kibabii University
[3] Professor of Economics of Education, Kibabii University
Corresponding Author Email: sarahlooniyo@yahoo.com

Abstract

Inclusive education is vital for providing equitable learning opportunities for all children, especially those with disabilities and special learning needs. Special needs education training equips teachers with the necessary skills and knowledge to support diverse learners in primary schools. However, the effectiveness of such training programs in Kenya remains underexplored. This study investigates the role of special needs training in teacher professional development as a means to enhance inclusive education in Kenyan public primary schools. The research aims to examine the impact of special needs training on teachers' ability to implement inclusive practices, assess the integration of the Universal Design for Learning (UDL) framework in training programs, and identify barriers to inclusive education. It also evaluates teachers' attitudes, knowledge, and preparedness to support learners with special needs and analyzes how educational policies and institutional support influence inclusive practices. Based on the findings, the study will recommend strategies to improve special needs training within teacher professional development. Grounded in the Universal Design for Learning and the Social Model of Disability, this study uses a review of secondary data to explore current gaps in inclusive education training. It will highlight challenges that hinder teachers' ability to accommodate learners with disabilities and identify effective practices that promote inclusive classrooms. The findings are expected to guide policymakers, education stakeholders, and training institutions by emphasizing the need for continuous professional development, focused inclusive training, and supportive policy frameworks. Ultimately, the study aims to enhance teacher preparedness, promote inclusive school environments, and improve educational outcomes for all learners in Kenya.

Keywords: Inclusive Education, Public Primary Schools, Teacher Professional Development

"Bridging the Gap: Exploring Community Awareness and Support for Inclusive Education in Gasabo District, Rwanda"

Jean Paul Muhire[1]   Martha Nduta Kiarie,[2] and Denis Okemwa,[3]
[1]School of Education Mount Kigali University: muhirejeanpaul456@gmail.com
[2]School of Education Mount Kigali University: Corresponding author: nduta_kiarie@yahoo.com
[3]Department of Business Tourism and Hospitality, Rongo University
Corresponding author: Email: denisokemwa2@gmail.com

Abstract

This study investigated the level of community awareness in the implementation of Inclusive Education (IE) in Gasabo District, Rwanda. The study utilized qualitative methodology, 64 stakeholders including headteachers, local leaders, and parents of children with and without disabilities were selected through purposive and convenience sampling. Data were analyzed using thematic, narrative, and interpretive approaches. Findings revealed that limited understanding of Inclusive Education among community members hinders the support and integration of children with disabilities in inclusive education environment. The study recommends sustained community awareness campaigns, engagement of local and religious leaders to address cultural beliefs about disability, and strategies to mitigate financial barriers to access. It also underscores the need for active parent-community collaboration through regular communication and workshops. These findings inform the development of monitoring and evaluation frameworks and advocate for cross-sectoral partnerships to correct misconceptions about disability and promote the benefits of inclusive education to all learners in Gasabo District, Rwanda.

Keywords: Community awareness, Inclusive Education

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Gamification for Life Skills Education in Kenyan Junior Schools: An Emerging Pedagogical Trend

Sarah Looniyo[1], Manasi Echaune[2] and Tecla Kirwa[3]
[1] Doctoral Student Department of Educational Planning and Management- Kibabii University
[2] Senior Lecturer – Department f Educational Planning and Management- Kibabii University
[3] Senior Lecturer- Department of Business and Economics-Kibabii University

Corresponding Author Email: sarahlooniyo@yahoo.com

Abstract

In an era where traditional teaching methods are increasingly being challenged by the evolving needs of 21st-century learners, gamification has emerged as a promising pedagogical approach, particularly in the area of life skills education. Research indicates that incorporating game-based elements into instruction can significantly enhance student engagement, participation, and retention of key concepts—especially when these elements are purposefully aligned with specific learning outcomes. This study aims to explore the integration of gamified strategies into life skills instruction within Kenyan Junior schools, focusing on their potential to improve learners' motivation, engagement, and the acquisition of real-world competencies. The general objective is to investigate the role and effectiveness of gamification as a teaching approach in enhancing life skills education at the Junior school level. The study is underpinned by two key theoretical frameworks: Self-Determination Theory (SDT), which emphasizes intrinsic motivation driven by autonomy, competence, and relatedness; and Constructivist Learning Theory, which supports the idea that learners build knowledge through active, experiential engagement. These theories provide a strong foundation for understanding how gamification can create meaningful, student-centered learning experiences. This study will use a review of secondary data. The significance of this study is multifaceted. It offers valuable insights into innovative pedagogical strategies that can make life skills education more relevant and engaging. It also provides evidence-based recommendations for integrating gamification into Kenya's Competency-Based Curriculum (CBC), thereby promoting 21st-century skills such as problem-solving, communication, and critical thinking. Additionally, the study contributes to the limited body of empirical research on gamification in African primary school contexts and highlights practical opportunities for developing culturally and contextually relevant gamified tools for life skills education.

Keywords: Life Skills, Junior Schools, Pedagogical trends

Examining Professional Development Needs: Teachers' Competencies for 21st-Century Classrooms in Kenyan Primary Schools

Sarah Looniyo[1], Manasi Echaune[2] and Tecla Kirwa[3]
[1] Doctoral Student Department of Educational Planning and Management- Kibabii University
[2] Senior Lecturer – Department f Educational Planning and Management- Kibabii University
[3] Senior Lecturer- Department of Business and Economics-Kibabii University

Corresponding Author Email: sarahlooniyo@yahoo.com

Abstract

As global education systems shift toward 21st-century learning paradigms, the role of the teacher has become increasingly complex, demanding a diverse set of competencies beyond traditional pedagogy. In Kenya, the rollout of the Competency-Based Curriculum (CBC) highlights the pressing need to align teacher professional development (PD) with emerging educational expectations. This study examines the Professional Development needs of Kenyan primary school teachers, focusing on their preparedness and capacity to facilitate effective 21st-century instruction. Anchored in the Technological Pedagogical Content Knowledge (TPACK) framework and constructivist learning theory, the study explores essential teacher competencies, including digital literacy, collaborative teaching, learner-centered methodologies, critical thinking facilitation, and inclusive education practices. Drawing on secondary data, the research will reveal substantial gaps in digital integration, instructional design, and competency-based assessment. The Findings also point to systemic barriers such as inadequate infrastructure, fragmented training programs, and misalignment between policy and practice, all of which hinder meaningful teacher development. These challenges underscore the need for a coherent, context-sensitive approach to Professional Development. This study contributes to the broader discourse on teacher development in sub-Saharan Africa by offering contextually grounded recommendations. It calls for the adoption of a continuous, responsive Professional Development model tailored to local realities and the dynamic educational landscape. The goal is to guide education stakeholders, curriculum developers, and training institutions in designing evidence-based strategies that empower teachers to foster relevant, high-impact learning outcomes in Kenyan primary classrooms.

Keywords: Professional Development Needs, Teachers' Competencies, Primary Schools

SUB-THEME #5
GOVERNANCE AND POLICY INNOVATION

Safeguarding Encryption in the Quantum Era: Analysis of Cryptographic Risks and Policy Responses

John Kariuki & Wilfred Odoyo
Pioneer International University
John.wambui@students.piu.ac.ke; Wilfred.odoyo@piu.ac.ke

 Abstract
This study examines the escalating threats posed by quantum computing to classical encryption systems (e.g., RSA, ECC) and evaluates strategic policy responses aimed at bolstering global cybersecurity. Employing a mixed-methods approach, it integrates a systematic review of quantum algorithms (e.g., Shor's algorithm), case studies of national initiatives such as NIST's Post-Quantum Cryptography Project, and quantum attack simulations on RSA-2048 using IBM's Qiskit. Triangulation was achieved by cross-validating findings from literature, empirical simulations, and policy case studies, ensuring robustness and credibility of results. The study reveals that quantum advancements could render current asymmetric encryption obsolete within the next decade, posing severe risks to sectors dependent on secure communication. However, despite emerging solutions such as lattice-based cryptography and quantum key distribution, implementation remains hindered by technical challenges and inconsistent global regulations—with only 35% of surveyed nations adopting quantum-readiness protocols. Ethical concerns also arise, particularly around quantum supremacy exacerbating digital inequality. To address these gaps, the study recommends agile, interdisciplinary collaboration among scientists, policymakers, and technologists to accelerate the adoption of standardized post-quantum algorithms, invest in quantum literacy, and formulate international governance frameworks. In conclusion, the research aligns with its original aim: to assess quantum threats and propose actionable, equitable pathways for securing digital infrastructure in a post-quantum world.

Keywords: Quantum computing, encryption, post-quantum cryptography, cybersecurity policy, Shor's algorithm, triangulation

Harnessing Innovation for Sustainable Growth through ICT and Digital Transformation

Agwenyi Christopher
Department of Information Technology
School of Computing and Informatics
Kibabii University
P.O. Box 1699-50200, Bungoma County, Kenya
+254720384902
anderechris2014@gmail.com

Abstract

The rapid evolution of Information and Communication Technology (ICT) has become a cornerstone for driving sustainable growth in the 21st century. This paper explores the role of ICT and digital transformation in addressing cross-cutting issues such as climate change, economic inequality, and resource management, while fostering innovation for sustainable development. By leveraging case studies and empirical data, the study highlights how digital tools-such as artificial intelligence, blockchain, and the Internet of Things (IoT-can optimize resource utilization, enhance transparency, and promote inclusive growth. The research employs a mixed-methods approach, combining qualitative analysis of policy frameworks and quantitative assessment of ICT adoption in various sectors. Findings reveal that ICT-driven innovations significantly contribute to achieving the United Nations Sustainable Development Goals (SDGs) by enabling smarter cities, efficient energy systems, and equitable access to education and healthcare. However, challenges such as digital divide, data privacy, and cybersecurity risks must be addressed to fully harness the potential of ICT for sustainable growth. This paper concludes with actionable recommendations for policymakers, businesses, and civil society to integrate ICT into sustainable development strategies, ensuring that innovation benefits all stakeholders equitably.

Keywords: ICT, Digital Transformation, Sustainable Growth, Innovation, Cross-Cutting Issues

"Integrated National Digital Identity System: Transforming Governance and Public Service Delivery through a Lifetime Citizen Database"

Alex Kimotho Kanyi
Pioneer International University
0113332382
kanyialex8@gmail.com

Abstract

In an era of rapid digital transformation, the need for an integrated and secure national database has become paramount for efficient governance and public service delivery. This study proposes the development of a Lifetime Citizen Digital Identity System (LCDIS - a centralized government database that securely stores and manages an individual's records from birth to adulthood. This system would integrate birth certificates, education records, employment history, healthcare records, tax filings, and legal documents, ensuring seamless access for both citizens and authorized entities, including employers and government agencies. The proposed system leverages blockchain technology for security, biometric authentication for identity verification, and AI-driven analytics for fraud detection and personalized public service delivery. By eliminating bureaucratic inefficiencies and reducing identity fraud, this innovation aims to enhance e-governance, transparency, and accessibility of critical services. However, its implementation requires addressing data privacy, cybersecurity risks, and regulatory frameworks to ensure ethical and legal compliance. This paper explores the opportunities, challenges, and policy implications of such a transformative initiative, offering recommendations for its successful deployment in modern governance systems.

Budgetary Controls Practices and Financial Perfomance of Salt Manufacturing Firms in Kilifi County, Kenya

Cosmus Karisa Katana[1], Rashid Fwamba[2]
cosmuskarisa284@gmail.com, rfwamba@kibu.ac.ke,

Abstract

The numerous financial difficulties faced by salt manufacturing firms in Kenya have resulted in the closure of many businesses, as they are unable to operate efficiently and sustainably. These financial shortcomings have largely been attributed to weak adherence to cash control practices. This study sought to examine the effect of budgetary control practices on the financial performance of selected salt manufacturing firms in Kilifi County, Kenya. The study was guided by the Stewardship Theory. A descriptive research design was employed, targeting a population of 1,100 employees from the four salt manufacturing firms in Kilifi County. A sample of 293 respondents, consisting of senior and middle level managers, were selected. Primary data was collected using structured questionnaires, while secondary data was obtained from audited annual financial statements of the firms. A pilot study was conducted in salt manufacturing firms located in Mombasa County, with questionnaires distributed to finance officers. Reliability testing using Cronbach's alpha yielded a coefficient of 0.814, indicating strong internal consistency. Additionally, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for budgetary control practices was 0.784, surpassing the acceptable threshold of 0.5. Data analysis involved both descriptive and inferential statistics, with the help of the Statistical Package for Social Sciences (SPSS). Inferential analysis included correlation and regression analysis, and ANOVA tests were also carried out. The findings revealed that budgetary control practices have a significant positive influence on the financial performance of manufacturing firms in Kilifi County. The study concluded that effective budgetary control practices notably enhance financial performance. Therefore, future research should focus on additional factors that may influence the financial performance of manufacturing firms across the country to establish more comprehensive conclusions.

Keywords: *Budgetary Control Practices, Financial Performance, Salt Manufacturing Firms, Stewardship Theory, Profitability*

Examining the Effect of Policy Evaluation Practices on Performance of Public Institutions in South Sudan

Atem Madut Yaak Kur Kadian Wanyonyi Wanyama [2] & Maxwell Adea, [3]*
Department of Business Administration, School of Business Management, University of Juba, South Sudan; +254721340373;

Abstract

This study examines how policy evaluation practices influence the performance of the Ministry of Defence and Veteran Affairs in South Sudan. The Ministry faces significant recruitment and selection challenges due to limited infrastructure, resources, and a developing education system, challenges that are intensified by the country's post-conflict environment. To explore these issues, the research employed a mixed-methods approach, combining quantitative surveys with 342 respondents (response rate: 85.9%) and qualitative data from 30 key informant interviews using semi-structured protocols. The theoretical framework integrated Institutional Theory, which explains how organizational norms shape policy practices; Policy Implementation Theory, focusing on the processes affecting policy delivery; and Resource Dependency Theory, highlighting how resource constraints influence organizational behavior. These theories guided the development of measurement tools and interpretation of results, especially regarding the impact of institutional and resource factors on policy evaluation effectiveness. Quantitative analysis using regression modeling at a 5% significance level ($p<0.05$) revealed a strong positive correlation ($r = 0.692$) between policy evaluation practices and organizational performance, with an R^2 of 0.479. This indicates that nearly 48% of performance variability can be explained by the extent of policy evaluation efforts. The findings emphasize the crucial role of systematic evaluation mechanisms in enhancing organizational outcomes. The study recommends strengthening policy evaluation frameworks, investing in education and infrastructure, establishing regular monitoring and feedback systems, and enhancing capacity-building for personnel involved in policy evaluation. Additionally, stakeholder engagement and performance-based incentives are suggested to further improve policy impact. Future research should explore how contextual factors such as post-conflict recovery, political stability, and external support influence policy evaluation effectiveness. Overall, this research provides empirical evidence supporting systematic policy evaluation as vital for improving organizational performance and stability in fragile states like South Sudan.

Keywords: *Policy Evaluation Practices, Organizational Performance, Public Institutions, South Sudan, Post-Conflict Recovery, Institutional Theory, Resource Dependency Theory, Policy Implementation Theory*

Effect of Innovation Adoption on the Performance of Commercial Banks in Nairobi City County, Kenya

Yona Israel Samo[1], Kadian Wanyonyi Wanyama[2], Michael Washika Okonda[3]
yonah.samo@gmail.com[1], kwanyonyi@kibu.ac.ke[2], washiks2012@gmail.com[3]
Department of Business Administration and Management, School of Business and Economics,
Kibabii University, Kenya

Abstract

This study examined the impact of innovation adoption on the performance of commercial banks in Nairobi City County, Kenya, amidst rapid technological advancements, evolving customer preferences, and regulatory changes. Guided by the Resource-Based View (RBV) and Innovation Adoption theories, the research aimed to determine how innovation activities influenced key performance indicators such as profitability, operational efficiency, and customer satisfaction. A mixed-methods approach was employed, involving a cross-sectional survey of 108 bank managers selected through stratified random sampling, complemented by semi-structured interviews with 38 CEOs to gain deeper insights. Data collection instruments were validated through a pilot study, ensuring reliability. Quantitative data were analyzed using descriptive statistics and simple regression analysis, while qualitative data underwent thematic analysis to identify recurring themes related to innovation practices and organizational culture. The findings indicated that banks actively engaged in innovation initiatives, including investing in research and development, developing new products, adopting emerging technologies, and fostering an innovation-friendly culture, with mean scores exceeding 4.00 on a five-point scale. Regression analysis revealed a significant positive relationship between innovation adoption and bank performance ($\beta = 0.604$, $p < 0.001$), with an R-squared value of 0.445, suggesting that approximately 45% of performance variation was explained by innovation adoption activities. The results underscore the strategic importance of fostering a supportive innovation environment to enhance operational efficiency and customer satisfaction. Practical recommendations include developing organizational strategies that prioritize innovation, investing strategically in emerging technologies, and cultivating an organizational culture that encourages innovation. Policymakers are encouraged to facilitate regulatory frameworks that support technological adoption and innovation-driven growth within the financial sector. The study, therefore, contributes to existing literature by highlighting the tangible benefits of innovation adoption and offering actionable insights for banks seeking a competitive advantage in a dynamic financial landscape.

Keywords: Innovation Adoption, Commercial Banks, Performance, Nairobi City County, Resource-Based View Theory, Innovation Adoption Theory

Ethical Dilemmas in the Digital Age: Privacy, Freedom of Speech, and Censorship among Generation Z in Kenya

[1]Agwenyi C.A, [2] Mbugua S.M
Department of Information Technology
[1,2]Kibabii University
[1]anderechris2014@gmail.com , [2]smbugua@kibu.ac.ke

Abstract

The rapid digitalization of communication in Kenya has significantly transformed how Generation Z engages with information, expresses opinions, and safeguards personal data. This study examines the ethical dilemmas surrounding digital privacy, freedom of speech, and censorship among Kenyan youth aged 18–27, within the framework of governance and policy innovation. The primary objective is to explore how existing digital governance policies affect the ethical values and digital rights of this demographic, particularly in the context of increasing surveillance, algorithmic control, and online content moderation. A mixed-methods research design was employed, combining quantitative surveys with 312 participants across five counties and qualitative in-depth interviews with 20 key informants, including digital rights activists, policymakers, and ICT professionals. The data were analyzed using thematic analysis and statistical inference methods to identify patterns in digital behavior, perceptions of online freedom, and trust in regulatory institutions. Findings indicate a growing tension between the desire for unrestricted digital expression and concerns over online safety, misinformation, and state surveillance. While 68% of respondents expressed support for free speech online, over 70% also reported incidents of content takedown or account suspension without clear justification. The study further reveals gaps in awareness of digital rights and inconsistent policy enforcement by government agencies. This paper concludes that Kenya's policy frameworks must evolve to balance ethical digital governance with the democratic ideals of privacy and expression. It recommends participatory policy-making processes that include youth voices and the development of transparent, rights-based digital regulations. These reforms are crucial for fostering a digitally just society where innovation does not come at the cost of civil liberties.

*Keyword*s: Digital ethics, Generation Z, Privacy, Freedom of speech, Censorship, Digital rights

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E-Governance and Digital Public Service: Transforming the State-Citizen interface in the 21ˢᵗ Century

Andrew M. Musungu
County Government of Bungoma / Kibabii University
Email: andrewmusungu@outlook.com
Phone: 0721297649

Abstract

The integration of e-governance into public service has revolutionised the way governments interact with citizens, businesses and other stakeholders. This new transformative trend in public administration is promising and heralds a new era of efficiency, transparency and citizen engagement. The paper explores the theoretical frameworks underpinning e-governance, assess global and regional implementation trends, and evaluates both the opportunities and challenges of the digital first strategy of governance. Case studies from Estonia, India and Kenya will form a critical backdrop in analysing the role of digital technology in enhancing public service provision and democratic governance. The discussion concludes with policy recommendations to improve design and delivery of e-governance in developing countries.

Keyword*s: e-governance, digital public service, netizens, eCitizen platforms, digital governance.*

Influence of Collaborative Partnerships and Financial Performance of Commercial banks in Juba, South Sudan

Magok Chuol Thomas
Kibabii University
chuolmagok@gmail.com

Joshua Olang'o Abuya
Kibabii University
jabuya@kibu.ac.ke

Moses O. Owino
Kibabii University
mowino.mo@gmail.com

Abstract

This study explores the influence of collaborative partnerships on the financial performance of commercial banks in Juba, South Sudan, a context characterized by economic instability and developmental challenges. Recognizing the vital role of these banks in fostering financial stability, inclusion, and economic growth, the research examines how strategic alliances with local and international stakeholders impact their operational efficiency, risk management, and overall profitability. The significance of this study lies in its potential to inform policymakers and banking practitioners on leveraging partnerships to enhance resilience and performance in fragile economies. Employing a mixed-methods approach, the study combines quantitative analysis of financial data from selected banks with qualitative interviews of bank managers and stakeholders to assess partnership impacts. The findings reveal that collaborative partnerships positively influence banks' financial outcomes by improving access to resources, innovative services, and risk mitigation strategies. The study concludes that fostering strategic alliances is essential for strengthening the financial sector's stability and inclusivity in South Sudan. Based on these insights, it is recommended that commercial banks actively pursue partnership opportunities with development agencies, international financial institutions, and local organizations to enhance their capacity for sustainable growth and contribute effectively to national economic development.

Resources Allociion and Teachers' Professional Development in Kenya

Wechuli Simiyu Christopher[1] & Julius Maiyo [2]
School of Education, Department of Educational Planning & Management,
Kibabii University, Kenya

Abstract

Strategic resource allocation for teacher's professional development is a crucial initiative in enhancing the education quality in Kenya. The Teachers Service Commission (TSC) and Ministry of Education initiative to enhance teacher's capacity through mentorship, coaching and TPD modules training programmes remains poorly implemented and underfunded hindering continuous capacity building for teachers. This paper objectives are; to investigate the relationship between resources allocation and quality of professional development programmes and examine how resources availability affects teacher's involvement in continuous professional development activities. A descriptive survey design was utilized. The study population was 241 teachers, 91 school administrators and 29 Subcounty directors of education who were sampled using simple random sampling to come up with a sample of 186 teachers and 28 school administrators and 13 Subcounty Directors of Education from both rural and urban setting. Data from teachers and school administrators was obtained using questionnaires while interview guides were used to obtain data from Subcounty Directors. Qualitative data was thematically analyzed while Quantitative data were analyzed using descriptive statistics and inferential statistics (Pearson correlation and chi-square test). The findings were presented in form of tables. Findings revealed that inadequate funding, insufficient time allocation and lack of sufficient ICT resources were common challenges to effective teachers' professional development through mentorship, coaching and capacity building workshops. Strategic resource allocation determines both the participation levels and quality of teachers' professional development in Kenya. Where resources are strategically and appropriately allocated, professional development is more structured and effective. The study recommends allocation of resources based on a needs assessment to ensure equitable support to schools in rural and marginalized areas where opportunities for professional development are often limited, the Ministry of Education through the Teachers Service Commission (TSC) should set aside budgets to support participation of teachers in CPD activities by covering travel expenses and materials. Additionally, teachers should actively be consulted in planning and decision-making process regarding the allocation of CPD resources to ensure relevance and ownership.

Keywords: Resources Allocation, Professional Development, Capacity Building

Validation of a Predictive Model for HIV Pre-Exposure Prophylaxis (PrEP) Uptake Among Youths in Turbo Sub-County, Kenya: A Study Protocol

Elizabeth Nailantei Kileku[1], Joseph Sitienei[2], Morris Senghor Shisanya[3], Nyawira Gitahi[4]

[1]Email. liznaila80@gmail.com , Phone: +254 723 509 611, P.O Box 4606-030100, Eldoret, Kenya
[2]Email. mshisanya@kibu.ac.ke, senghormorris@gmail.com Phone: +254 720 640 142, P.O. Box 1699-50200, Bungoma, Kenya
[3]Email: jksitienei@gmail.com , Phone +254 722 740 130, P.O. Box 30016 – 00100, Nairobi, Kenya
[4]Email: gnyawira@gmail.com, Phone: +254 722 387 23, P.O Box 4606-030100, Eldoret, Kenya
[1]Moi University/CDC/ Field Epidemiology and Laboratory Training Program
[2]Ministry of Health, Directorate of Health Policy, Monitoring and Evaluation.
[3]School of Nursing, Kibabii University
[4]Moi University, Department of Epidemiology and Medical Statistics, School of Public Health

Abstract

By 2023, HIV had claimed 40.4 million lives globally, with youths remaining disproportionately affected by new infections. Pre-exposure prophylaxis (PrEP) has demonstrated a 48.9% reduction in HIV transmission when combined with other prevention strategies. Despite its scale-up in sub-Saharan Africa since 2015, PrEP uptake remains suboptimal, particularly in Turbo Sub-County, Kenya. Understanding the determinants of uptake is essential to improving access and adherence among high-risk youth. To validate a predictive model assessing demographic, economic, social, behavioral, and structural factors influencing PrEP uptake among youths aged 15–24 in Turbo Sub-County with the goal of informing targeted interventions to increase uptake. A descriptive cross-sectional study design will be employed, integrating quantitative and qualitative methods. Youth participants will be selected through multistage random sampling across Wards and villages in Turbo. Data will be collected using structured self-administered questionnaires, interviews, and Focus Group Discussions (FGDs). Qualitative data will be analyzed thematically, while Structural Equation Modeling (SEM) will be used to test the hypothesized model relationships at a 95% confidence level ($\alpha < 0.05$). The study is expected to validate a predictive model for PrEP uptake, identifying key demographic, economic, and behavioral determinants through structural modeling. The model's reliability and goodness-of-fit will be assessed to ensure robustness in different community contexts. Results will generate actionable evidence to inform tailored HIV prevention interventions targeting youth in low-uptake settings. The validated model will offer a practical framework for guiding public health stakeholders in addressing barriers to PrEP uptake. Findings will support the design of context-specific strategies to enhance PrEP accessibility, ultimately contributing to the reduction of new HIV infections among youth.

Acceptability of Digital Mental Health Interventions for Depression and Anxiety: A Systematic Review

Emily M. Wamalwa, Wilsonpeter Kiliswa Mauko, Mike waswa, Purity Wambingwa, Christine Nyakambi
Alupe University
Email: wamalwaemmy@gmail.com;
0727210031

Abstract
Depression and anxiety remain two of the most widespread mental health disorders globally, driving the increased adoption of digital mental health interventions (DMHIs), including mobile applications and web-based platforms. These tools offer accessible alternatives to traditional therapy, particularly in settings with limited mental health resources. The success of DMHIs depends on their acceptability among users, which directly impacts adherence, engagement, and therapeutic outcomes. This systematic review aimed to evaluate the acceptability of DMHIs among adults diagnosed with depression or anxiety disorders, comparing their reception to that of in-person therapy or no intervention. The review followed PRISMA and PROSPERO guidelines to ensure methodological rigor. Data were synthesized using a narrative approach supported by vote counting, which involved categorizing studies based on whether they reported positive, neutral, or negative outcomes related to acceptability. Ten studies met the inclusion criteria: six focused on depression, two on anxiety, and two addressed both conditions. Most studies (63%) were randomized controlled trials, and the majority of interventions were based on cognitive behavioral therapy (CBT). Adherence to interventions averaged around 80%, with dropout rates ranging from 10% to 25%. High acceptability was reported in 88% of the studies, 8% had mixed findings and 4% provided insufficient data. Reliance on self-reported satisfaction as a measure of acceptability may inflate perceived effectiveness and limit comparability across studies. To enhance future research, there is a need for standardized frameworks for assessing acceptability.

Assessment of Bacterial Contamination on Used Handkerchiefs Among 5–6-Year-Old School Children in Bungoma County, Kenya

Adelaide Selly Khasabuli, Festus Kelonye, Morris S. Senghor, Benjamin Nyongesa
Kibabii University

Abstract

Children aged 5–6 years are highly susceptible to bacterial infections such as respiratory and diarrheal diseases due to immature immune systems and limited hygiene awareness. Handkerchiefs, commonly used for personal hygiene by schoolchildren, can serve as reservoirs for pathogenic bacteria, especially when poorly maintained. In Bungoma County, where sanitation challenges persist in many schools, contaminated handkerchiefs may significantly contribute to childhood illness, yet this remains underexplored in research. To assess the bacterial contamination on used handkerchiefs among school-going children aged 5-6 years in Bungoma County, Kenya, and evaluate the factors influencing bacterial load to inform hygiene improvement strategies.A cross-sectional mixed-methods design will be employed. Bacterial colonies will be identified using microscopic, biochemical, and staining techniques. After incubation, colony-forming units (CFUs) will be counted on each plate. Only plates with 30–300 colonies will be considered reliable. Bacterial load will be recorded as CFU/mL based on dilution factor. For microscopic cell count, a portion of the bacterial suspension will be used to prepare slides. Smears will be air-dried, heat-fixed, and subjected to Gram staining. Crystal violet (primary stain) will be applied for 1 minute. Iodine solution (mordant) will be applied for 1 minute. Slides will be rinsed with alcohol decolorizer and then counterstained with safranin. Bacteria will then be viewed under a light microscope at 1000x (oil immersion). Hygiene awareness and practices will be assessed through structured questionnaires administered to children and their guardians. Sample size will be determined using Cochran's formula, with stratified random sampling ensuring representativeness. Data will be analyzed using descriptive statistics, chi-square tests, t-tests, and logistic regression. Ethical approval will be obtained from Kibabii University IREC and NACOSTI, with informed consent from parents/guardians and assent from children. The study will determine the extent and types of bacterial contamination on children's handkerchiefs, associated risk factors, and gaps in hygiene knowledge and practices among children and caregivers. Findings will inform targeted interventions to reduce microbial contamination, improve hygiene practices, and strengthen school health policies in Bungoma County. The results will be disseminated through peer-reviewed publications, policy briefs, and stakeholder forums for public health and education sectors.

Outcomes of Kangaroo Mother care and Determinants of its utilization Among Low-Birth-Weight Infants in Busia, Kisii and Migori Counties, Western Kenya

Selline Mukabi
Masinde Muliro University of Science and Technology
0721588868

Everlyne Morema
0721262748

Mary Kipmerewo
0722797865

Morris S. Senghor
0720640142

Abstract

Kangaroo Mother Care (KMC) is a beneficial method for bonding, breast-feeding and temperature control of all new-born infants, regardless of weight, gestational age and clinical condition. In low-income neonatal units, the method is used 24 hours per day (continuous KMC), but in affluent settings with high-tech equipment (incubator use), the method is usually implemented as shorter sessions (intermittent KMC). It has been recommended that staff initiate continuous KMC, even in a high tech-unit, as soon as possible after the infant is born and after initial resuscitation and stabilization. In Western Kenya, Migori, Kisii and Busia Counties have reported an increasing trend of preterm births ranging from 22.3% to 30.6% in the period 2018 to 2020 respectively. However, there is limited systematic information available on the barriers to KMC practice those mothers and other stakeholders face while practicing Kangaroo mother care in Busia, Kisii and Migori Counties. This study will adopt a mixed-research design targeting caregivers of LBW infants and healthcare providers using purposive sampling. Data will be collected through semi-structured, pretested interviewer-administered questionnaires. Quantitative data will be analyzed using SPSS version 26. Bivariate and multivariate logistic regression analysis will identify significant predictors of KMC utilization. Variables with $P < 0.05$ in bivariate analysis will be included in multivariate models, with results reported using Adjusted Odds Ratios and 95% CI. The study will involve a representative sample size, determined through power analysis, of caregivers and healthcare providers in the three counties. Ethical approval will be secured, and participants will provide informed consent before data collection. Qualitative data will be analyzed thematically to explore contextual barriers and facilitators of KMC. The study findings will generate evidence-based recommendations for strengthening KMC practices, informing policy adjustments, and enhancing community health education in Western Kenya, contributing to the achievement of SDG 3 by reducing neonatal and infant mortality.

Policy Frameworks for Sustainable Urban and Rural Development and Analytical Frame Work for Kenyan Scenario

Otte Zebedee Ekwenye & Samuel Mwanga Simiyu
Kibabii University
Otte@kibu.ac.ke
0720970062

Abstract

Sustainable urban and rural development is essential for achieving inclusive economic growth, environmental protection, and social equity. This paper examines the critical role of policy frameworks in shaping development trajectories that balance urban expansion with rural transformation. It explores how integrated planning, participatory governance, and cross-sectoral coordination can help address challenges such as rapid urbanization, rural poverty, inadequate infrastructure, and environmental degradation. The study highlights the need for policies that promote equitable access to resources, strengthen local governance structures, and foster resilient, climate-smart infrastructure in both urban and rural contexts. Drawing on global best practices and regional case studies, particularly from Sub-Saharan Africa and Southeast Asia, the paper proposes a set of strategic recommendations for designing inclusive and adaptive policy frameworks. These include harmonizing urban and rural planning, leveraging digital technologies, ensuring gender and youth inclusion, and aligning national strategies with the Sustainable Development Goals (SDGs). The findings underscore that sustainable development cannot be achieved without deliberate efforts to integrate urban and rural policy agendas under a unified, long-term vision.

SUB-THEME #6
CROSS-CUTTING ISSUES

Digital Transformation and Social Change in Kenya: Trends and Perspectives

Mark Leting and Samuel Mwanga Simiyu
Kibabii University
E-mail; mletting@kibu.ac.ke & sisam2448@yahoo.com

Abstract
Kenya stands at the forefront of digital transformation in Africa, leveraging advancements in mobile technology, internet connectivity, and digital platforms to drive socio-economic change. This paper examines the multifaceted impacts of digital transformation and social change in Kenya specifically trends and perspectives guided by specific case studies. More so, highlighting both the opportunities and challenges that have emerged. Key trends include the proliferation of mobile money services like M-Pesa, which have enhanced financial inclusion, and the expansion of e-government initiatives aimed at improving public service delivery. Additionally, the rise of digital entrepreneurship and innovation hubs has fostered job creation and economic diversification.   However, the digital divide remains a significant concern, with disparities in access to technology and digital literacy, particularly among women and youth in rural areas, potentially exacerbating existing inequalities. The paper further explores the role of digital platforms in shaping civic engagement and political activism, noting how increased internet access has facilitated greater public participation in governance processes. By analyzing these dynamics, the study provides a comprehensive perspective on how digital transformation is reshaping Kenya's social landscape and offers policy recommendations to ensure inclusive and equitable digital development.

Keywords: Digital transformation, Digital entrepreneurship, civic engagement, political activism, digital innovation, social change

Effect of Utilization of Digital Delivery on Performance of Learners in Literature in Public Universities in Western Kenya

Wanyama M. N[1], Nyongesa B[2] and Masibo, E[3]
Kibabii University, Department of Curriculum and Pedagogy[1, 3]
Kibabii University, Department of English, Literature & Mass Communication[2]

Abstract

The study focused on assessing the effect of utilization of Digital delivery on the Performance of Literature learners at Public Universities in Western Kenya. The study specific objective was to: Examine the effect of utilization of Digital delivery on Performance of learners in Literature in public universities in western Kenya. The study was guided by Connectivism theory. It adopted a descriptive survey design, targeting 899 learners and 32 lecturers. A sample of 277 learners and 32 lecturers was selected using proportionate sampling techniques and census technique respectively. Data was collected using interviews and structured questionnaires. The researcher ensured validity by testing construct, criterion and content validity and reliability through expert input and statistical analysis. For learners, results show a coefficient of determination (R^2) of 0.172 meaning that Digital delivery explain up to 17.2% of the variance in Academic Performance. The adjusted R square attempts to produce a more honest value to estimate R square for the population. The F test gave a value of $F_{(1, 336)} = 69.888$, $p < 0.01$, which supports the goodness of fit of the model in explaining the variation in the dependent variable. It also means that Digital delivery is a useful predictor of Academic Performance. The unstandardized regression coefficient (Beta) value of Digital delivery was 0.272, $p < .001$. This indicated that a unit change in digital delivery would result to change in Academic Performance by 0.272 significantly. For lecturers. The study revealed that Digital delivery had a significant positive effect on Academic Performance with $p < 0.05$ and it significantly accounted for 17.2% variance in Academic Performance. These findings emphasize the importance of Digital materials in enhancing student learning outcomes in literature studies, though further research is needed to fully understand this dynamic. For lecturers, the study found a statistically significant relationship between digital learning platforms and performance, explaining approximately 80.3% of the variance in performance. Digital delivery and positively influenced performance, the study highlights a consensus among learners and lecturers on the positive impact of Digital Delivery on performance in literature courses in Western Kenyan universities. Both groups recognize the significance of digital resources in enhancing comprehension, engagement, research ability, and overall learner success. However, challenges such as technological infrastructure and quality control need to be addressed to optimize integration and effectiveness. To enhance performance in literature education through digital learning: Policymakers should prioritize integrating Digital delivery methods. Educational institutions need to address challenges related to technological infrastructure and quality control. Investing in robust technological infrastructure and implementing quality control measures will enhance the accessibility, usability, and reliability of digital resources. This includes providing access to digital resources, ensuring technological infrastructure and support, and offering professional development opportunities for educators.

Impact of Membership Growth on SACCOs' Financial Performance in Western Kenya

Collins F. Wanyonyi & Fred Atandi

Abstract

This study investigates the impact of membership growth on the financial performance of Savings and Credit Cooperative Societies (SACCOs) in Western Kenya. Using data collected from 152 respondents across various SACCOs in the region, the study employed descriptive and inferential statistics to analyze the relationship between membership growth and financial performance. The findings reveal that membership growth has a significant positive effect on SACCO financial performance, explaining approximately 22.6% of the variation in performance. The study recommends that SACCOs should develop comprehensive membership recruitment strategies, offer competitive membership benefits, and engage in community outreach programs to enhance their financial sustainability.

Analysis of Bandwidth Monitoring Technologies and Challenges Facing Bandwidth in Kenyan Universities

Martin Cherotei[1], Prof. Samuel mbugua[2], Alice Nambiro[2], Daniel Otanga[3]
mcherotei@kibu.ac.ke, anambiro@kibu.ac.ke, dotanga@mmust.ac.ke
1, 2 - Kibabii University
3, - Masinde Muliro University of Science and Technology

Abstract

The objective one of this paper was to determine '**bandwidth monitoring technologies employed in Kenyan University**' A literature review was carried out on various monitoring technologies used by various institutions. With the dynamic nature of SNMP Monitoring technologies for institutions, there is high competition in the market for monitoring tools. Several tools determined with most common being Solarwind. Objective two was to determine the challenges facing bandwidth distribution in Kenya. At the firewall, the data captured was an indication of the amount of bandwidth entering the university from the Internet Service provider. In most cases the data collected at the firewall is either inbound traffic or outbound traffic, inbound traffic is traffic coming to the network from the ISP while Outbound is traffic flowing outside the network. The data collected was used to determine the amount of data bandwidth entering and leaving the network. From the analysis of data at the firewall, it was found that the university receives the nearly equivalent of what it subscribes to per the ISP bandwidth agreement. Some of the challenges were bandwidth policy, ICT infrastructure and increased use demand. Overcoming these challenges will enhance the intersection of ICT and workforce development in institutional settings. This will in turn increase job creation and youth empowerment.

Keywords; Bandwidth, Monitoring, Policy, ICT infrastructure, youth empowerment

Effect of Innovation Adoption on the Performance of Commercial Banks in Nairobi City County, Kenya

Yona Israel Samo[1], Kadian Wanyonyi Wanyama[2], Michael Washika Okonda[3]
yonah.samo@gmail.com[1], kwanyonyi@kibu.ac.ke[2], washiks2012@gmail.com[3]
Department of Business Administration and Management, School of Business and Economics,
Kibabii University, Kenya

Abstract

This study examined the impact of innovation adoption on the performance of commercial banks in Nairobi City County, Kenya, amidst rapid technological advancements, evolving customer preferences, and regulatory changes. Guided by the Resource-Based View (RBV) and Innovation Adoption theories, the research aimed to determine how innovation activities influenced key performance indicators such as profitability, operational efficiency, and customer satisfaction. A mixed-methods approach was employed, involving a cross-sectional survey of 108 bank managers selected through stratified random sampling, complemented by semi-structured interviews with 38 CEOs to gain deeper insights. Data collection instruments were validated through a pilot study, ensuring reliability. Quantitative data were analyzed using descriptive statistics and simple regression analysis, while qualitative data underwent thematic analysis to identify recurring themes related to innovation practices and organizational culture. The findings indicated that banks actively engaged in innovation initiatives, including investing in research and development, developing new products, adopting emerging technologies, and fostering an innovation-friendly culture, with mean scores exceeding 4.00 on a five-point scale. Regression analysis revealed a significant positive relationship between innovation adoption and bank performance ($\beta = 0.604$, $p < 0.001$), with an R-squared value of 0.445, suggesting that approximately 45% of performance variation was explained by innovation adoption activities. The results underscore the strategic importance of fostering a supportive innovation environment to enhance operational efficiency and customer satisfaction. Practical recommendations include developing organizational strategies that prioritize innovation, investing strategically in emerging technologies, and cultivating an organizational culture that encourages innovation. Policymakers are encouraged to facilitate regulatory frameworks that support technological adoption and innovation-driven growth within the financial sector. The study, therefore, contributes to existing literature by highlighting the tangible benefits of innovation adoption and offering actionable insights for banks seeking a competitive advantage in a dynamic financial landscape.

Keywords: Innovation Adoption, Commercial Banks, Performance, Nairobi City County, Resource-Based View Theory, Innovation Adoption Theory

Firm Level Characteristics Age and Financial Performance of Non-Financial Firms Listed on the Nairobi Securities Exchange

Eric mabele
Masinde Muliro University
Ericmabele9@gmail.com; Cell phone: 0722631769

Abstract

A high number of firms especially the listed non-financial firms have registered declining financial performance in recent years contra to shareholders' expectation. The study main objective was to determine the effect of firm level characteristics on the financial performance of non-financial firms listed on the NSE. Specifically: Liquidity, Leverage, Asset tangibility, Operation efficiency and firm Age as a moderator on financial performance. This research was anchored on the Agency theory as the main theory. The study used mixed research design of both descriptive research design and causal research design. The study targeted all the 34 non-financial firms listed on Nairobi Securities Exchange hence census sampling technique was adopted. The study was based on secondary data extracted from audited published financial statements for the listed non-financial firms on the NSE website for ten-year period (2014-2023). The study used Stata version 15 software for data analysis and presentation. Both descriptive and inferential techniques of data analysis were employed in the study. In the Descriptive analysis of data, the mean, standard deviation, variance, minimum and maximum values, range, skewness and kurtosis of the research variables were analyzed, while for inferential statistics: correlation analysis, multiple, hierarchical and step wise regression was used. The results revealed that independent variables used in the research were able to account for about 52.8% (R^2=0.528, P=0.000) of the variations that were noted in the financial performance of non-financial listed firms on the NSE in Kenya. Therefore, from the findings, Firms should be careful not to tie their investments in assets since increase in asset tangibility leads to decrease in financial performance. Finaly, Firms should prioritize long term strategic plans since age had appositive moderating effect on firm performance. The study recommended further research for all firms listed on the NSE to see if they exhibit same findings.

Keywords: Liquidity, Leverage, Asset tangibility, Operational efficiency, financial performance, Nairobi Securities exchange, non-financial firms

An Assessment of the Effect of Weighted Average Inventory Cost Measurement on Profitability of top 100 medium enterprises in Kenya

Judith A. Shibu
Email: jshibu@kibu.ac.ke
Kibabii University

Fred Atandi
fgatandi@kibu.ac.ke
Kibabii University

Abstract
This study assesses the effect of Weighted average cost measurement on the profitability of top 100 medium enterprises in Kenya using data collected from 300 respondents across the top 100 medium enterprises in Kenya. This study utilized Pearson Product Moment Correlation Coefficient Model, Probit function model, Principal factor model and Linear regression model to test the research objective, descriptive and inferential statistics to analyses the relationship between weighted average inventory cost measurement and profitability of the top a 100 medium enterprises in Kenya. The findings revealed that there is a positive correlation between Weighted Average Inventory Cost Measurement and Profitability of top 100 medium enterprises in Kenya. The study concluded that, embracement of International Accounting Standards will enhance confidence levels of forecasts and minimize errors among the 100 medium enterprises in Kenya. In conclusion this study recommends that local firms in Kenya should gradually transit from proprietary accounting methods for inventory cost measurement and adopt approaches that are more consistent with International Accounting standards (IAS).

Keywords: *Weighted average cost measurement, profitability of top 100 medium enterprises in Kenya*

Influence of Competitive Benchmarking on Service Delivery of Commercial Banks in Kenya

Amoni Ngimoe Thomas[1] Atandi Fred Gichana, [2] & Emily Okwemba, [3]
Department of Business Administration and Management, School of Business and Economics, Kibabii University, Kenya; +254720557266

Abstract

This study examined the impact of competitive benchmarking on service delivery in Kenyan commercial banks, focusing on Western Kenya. Benchmarking involves comparing organizational processes and performance metrics to industry best practices to identify gaps and promote continuous improvement. Competitive benchmarking specifically compares a firm's metrics with those of direct competitors, fostering strategic adaptation and operational excellence. Theoretical frameworks included the Theory of Constraints, which emphasizes identifying and managing bottlenecks to optimize processes, and the Theory of Competition, which highlights how market rivalry incentivizes innovation and performance enhancement both relevant to leveraging benchmarking for service improvement. Using a descriptive and correlational design, data were collected from 480 targeted respondents bank clerks, managers, analysts, and officers though only 111 responses were analyzed using Nassiuma's formula, raising considerations about non-response bias and the generalizability of findings beyond Western Kenya. Data collection involved questionnaires and structured interviews, with validity ensured through expert validation and reliability confirmed via Cronbach's alpha. Although the abstract does not specify measures of construct validity or how regression assumptions (normality, multicollinearity, homoscedasticity) were tested, analysis was conducted using SPSS version 22. Results demonstrated that competitive benchmarking significantly influences service delivery ($p < 0.05$). Regression analysis revealed a coefficient of $\beta = 0.425$, R = 0.586, a t-value of 7.312 and ($F_{(1,102)} = 53.468$), indicating a strong relationship. Specifically, a one-unit increase in benchmarking practices results in a 0.344 increase in service performance. The model explains 45% ($R^2 = 0.45$) of the variance in service delivery, implying other factors also influence performance. The findings underscore benchmarking's role in improving operational efficiency but acknowledge challenges such as resource constraints, organizational resistance, and data sharing. Recommendations include developing targeted benchmarking mechanisms for areas like customer satisfaction and process efficiency, along with establishing continuous monitoring systems. While insightful, the study's applicability may be limited to similar banking contexts in Western Kenya. It advocates for formal benchmarking policies to sustain competitive advantage in a dynamic financial environment.

Keywords: Competitive Benchmarking, Service Delivery, Western Kenya and Commercial Banks

Effect of Interest Rate on Financial Performance of Deposit Taking Saccos in Bungoma County, Kenya

Rose Waridi Kasiti Okwemba & Fred Atandi
Department of Economics Finance and Accounting, Kibabii University
Corresponding author email: rokwemba87@gmail.com; fgatandi@kibu.ac.ke

Abstract

SACCOs play a pivotal role in promoting financial inclusion and economic empowerment, particularly in rural and semi-urban areas. However, their sustainability and profitability are significantly influenced by macroeconomic variables, notably interest rate. Different DTSs have been adopting different strategies to manage loans such as interest rate. Therefore, this study sought to determine the influence of interest rates on financial performance of DTSs in Bungoma County, Kenya. This study was guided by liquidity preference theory. The study adopted survey research design that targeted all the three DTSs operating in Bungoma County according to SASRA report (2018); Ng'arisha Sacco Society Ltd, Stawisha Sacco Society and Mwalimu national Sacco Society ltd. Sixty three respondents consisting of Chief Executive Officers, Credit Managers, Finance Managers, Internal auditors, credit officers and Loan field Officers were targeted. Since the target population was small, census sampling was adopted. Questionnaires were utilized to gather primary data. Data was analyzed using descriptive statistics (mean, standard deviation and percentages). The findings revealed that interest rates has a positive influence on financial performance of DTSs in Bungoma County. Therefore interest rates is likely to improve financial performance of DTSs in Bungoma County. The study recommends that DTSs should set their interest rates within the rates that are set by commercial banks and Central bank of Kenya to ensure competitiveness and encourage more borrowing. This will lead to adequate control of the loan borrowing and repayment of loans thus enhancing financial performance of DTSs.

Keywords: Interest rates, DTSs, Bungoma County

When Vowel Hiatus Resolution Fails: The Role of Constraints in Lubukusu Phonology

Henry S. Nandelenga
Department of English, Literature & Journalism, Kibabii University, Kenya
Email: hnandelenga@kibu.ac.ke: Cellphone: 0739639826

Abstract

Vowel hiatus, in which dissimilar vowels follow each other across morpheme boundaries, is generally not tolerated cross-linguistically. When morpheme concatenation and other morpho-syntactic processes lead to emergence of such marked structure, repair mechanisms are triggered in the form of vowel hiatus resolution dubbed VHR. In Lubukusu, a Bantu language spoken in western part of Kenya, VHR is a regular repair mechanism through glide formation, vowel coalescence, vowel deletion and consonant epenthesis. The objective of the study was to identify contexts in which VHR may fail to materialize although it is a regular phonological process. In an Optimality Theory grammar (adopted here), VHR is invoked when markedness constraints against vowel hiatus outranks faithfulness constraints. The converse is true; VHR may fail when some faithfulness constraints are undominated in the constraint hierarchy. Data for the study was collected from five native speakers of Lubukusu who were purposefully sampled from competent Lubukusu speakers in Bungoma County. The prosodic word tokens were analyzed in the conventional OT tableaux. The analysis involved comparative evaluation of harmony of the candidate sets based on constraint ranking in the tableau. Results reveal that faithfulness to the underlying contrast, OCP effects, markedness of repair outputs and incompatible vowel feature values are responsible for VHR failure. It is, therefore, argued that both faithfulness and markedness constraints are responsible for failure in VHR. All these are explained through constraint interaction of markedness and faithfulness in a Lubukusu specific constraint hierarchy.

Keywords: Vowel hiatus, markedness, faithfulness, constraints, OCP effects

Integration of Traditional Religious Practices with Modern Conservation Approaches

Esther Were Shisia[1]; Margaret Nanjala Matisi[2] & Nelly Masayi[3]
1-2-3 - Kibabii University
Corresponding email: ekasavuli@yahoo.com
Cell phone: +254(0)715498250

Abstract
This study examines how African traditional religious practices can be integrated with modern conservation strategies to enhance the management of the Ramogi Hills Forest Ecosystem in Siaya County, Kenya. Against the backdrop of escalating global environmental challenges, which include biodiversity loss, ecosystem degradation, and climate change, this research explores the role of indigenous knowledge systems in sustainable ecosystem governance. The study aims to document traditional religious practices associated with forest conservation among communities surrounding Ramogi Hills, evaluate the compatibility of these practices with modern conservation approaches, and develop a framework for integrating traditional knowledge with scientific conservation methods. The research employs a mixed-methods approach, combining ecological assessments with qualitative data collection through semi-structured interviews (n=45), focus group discussions (n=6), and participant observation. Data was collected from purposively selected community elders, traditional religious leaders, conservation officials, and randomly sampled community members. Thematic analysis and descriptive statistics were used to analyze qualitative and quantitative data respectively. Findings reveal that traditional religious practices, including sacred groves (n=8), taboos against harvesting specific plant species, seasonal ritual ceremonies, and spiritual leadership structures significantly contribute to forest conservation by restricting access to sensitive areas and regulating resource use. Integration opportunities identified include community-based monitoring systems combining scientific metrics with traditional indicators, co-management arrangements recognizing traditional authority structures, and conservation education incorporating cultural values. Key barriers include weakening cultural transmission among younger generations, governance conflicts between traditional and formal institutions, limited policy recognition, and resource constraints. The study concludes that successfully integrating traditional religious practices with modern conservation requires legal frameworks recognizing indigenous knowledge systems, institutional reforms promoting co-management, inclusive stakeholder engagement processes, and documentation of traditional ecological knowledge. This research contributes to global discourse on indigenous knowledge in conservation and offers transferable lessons for ecosystem management in similar contexts where traditional practices remain influential. Limitations include the site-specific nature of the findings, necessitating further comparative research across different ecological and cultural contexts.

Keywords: Indigenous Knowledge Systems, Traditional Religious Practices, Modern Conservation Approaches, Ramogi Hills, Kenya, Forest Ecosystem Management

Enumeration Properties of Weakly Increasing 2-Noncrossing Trees

Yvonne Kariuki,
Kibabii University
ykariuki@kibu.ac.ke
+254705944229

Abstract

This paper introduces and enumerates weakly increasing 2-noncrossing trees and their increasing variants. The study employs combinatorial analysis techniques to enumerate these tree structures according to multiple parameters including number of vertices, root degree, and number of forests. The methodology involved systematic application of generating function techniques implemented using SageMath for symbolic computation and verification of enumeration formulas. The analysis revealed that weakly increasing 2-noncrossing trees with n vertices are enumerated by a sequence which generalizes the little Schröder numbers when counting by root degree. The study also produced explicit formulas for counting these structures by number of forests. These results demonstrate significant connections between these tree structures and established combinatorial sequences. The findings extend the understanding of 2-noncrossing tree structures and their relationship to Schröder numbers, providing new enumeration results with applications in computational biology and analysis of RNA secondary structures. Limitations include computational complexity constraints when analyzing larger structures and the need for further investigation of asymptotic behavior.

Keywords: Combinatorics, 2-noncrossing trees, Schröder numbers, enumeration, bijections

Functional Analysis of the Interpersonal Metafunctions in Artificial Intelligence Generated Political Speeches

Caroline Amukasa Andayi
Department of Literature, Linguistics & Foreign Languages, Kenyatta University, Kenya
amukasa.carolyn@gmail.com
0723372525

Abstract

Systemic functional Linguists is a social semiotic theory that focuses on how language is used in context. Functional Linguists postulate that a text serves the textual, ideational and interpersonal metafunctions. The textual function focuses on how text is structured, we conceptualize our world through the ideational metafunctions and the interpersonal metafunction enables interlocutors realize communication roles and maintain relationships. The use of speech is one of the ways in which the text producers interact with their audience. Substantial research has been carried out on the interpersonal metafunction in political speeches. However, there is scanty data on the analysis of speeches generated from Artificial Intelligence (AI) which has become an influential technology in the use of language. This paper, therefore, aimed at discussing the effectiveness of generating text using AI and conceptualizing how the interpersonal metafunctions has been realized in political speeches generated by ChatGPT. ChatGPT is a modern unsupervised language model that can generate human like texts. Data was collected by instructing ChatGPT to generate written speeches on abduction in Kenya. The inclusion criterion was used to purposively sample five speeches with the search terms 'abduction' and 'Kenya'. Textual analysis was used to describe the use of mood, modality and personal pronouns systems in achieving the interpersonal function. All the three systems were found in the generated speeches. Statements were mostly used to influence the audience's attitude on the negative impacts of abduction. The first person pronouns created intimacy between the speech producer and the reader. Through appropriate choice of lexical items, abduction was disapproved and regarded a very inhuman act. However, potential biasness in the effectiveness of AI generated speeches to influence the mood of the audience was noted. The findings are expected to add to existing knowledge in functional grammar and the role of technology in text processing.

Mathematical Modelling of Antimalarial Drug Resistance and Prevention

[1]*Ashibambo M Nancy, [1]Julius Maremwa Shichika, [1]Albert Bii.
[1]Department of Mathematics and Computer Science, University of Eldoret, Eldoret, Kenya
*Corresponding author: Email: nancyashibambo1995@gmail.com

Abstract

Malaria remains by far the world's most important tropical disease, killing more people than any other communicable disease. Several preventive and control measures have been implemented, including insecticide-treated mosquito nets, indoor residual spraying, environmental management, vaccination, and drug treatment. The emergence of drug resistance against the most common and affordable antimalarials is widespread and poses a key obstacle to malaria control. In this work, a standard Susceptible Infected Recovery (SIR) human vector interaction mathematical model for malaria was formulated. The study established a well-posedness of the model by showing the existence, uniqueness, positivity, and boundedness of solutions. An Epidemiological threshold R_0 , called the basic reproduction number was calculated. The disease-free equilibrium was found to be locally asymptotically stable if $R_0 < 1$ and unstable if $R_0 > 1$. Using the Lyapunov function we proved that the disease-free equilibrium point was globally asymptotically stable if $R_0 < 1$. Finally, the system of equations was solved numerically using simulated data derived from demographic and epidemiological parameters relevant to malaria transmission in Kenya, obtained from published literature and national health reports. The results show that, in order to reduce the spread of malaria in Kenya the number of mosquitoes, the vector population (M), and the probability of being infected by a mosquito per unit time (ϑ) must be reduced by applying optimal conditions such as vaccination, treatment, and vector control.

Keywords: Epidemiology, disease-free equilibrium, Lyapunov function,

Perceived Brand Authenticity and Smartphone Price Premium Tolerance by Millenials and Gen-Z in Busia Town

Faraji Yatundu and Sedina Misango
South Eastern Kenya University

Abstract

This study investigates how specific dimensions of brand authenticity affect Millennials' and Generation Z's tolerance for smartphone price premiums in Busia Town, Kenya. As these generational cohorts increasingly shape market trends, understanding how authenticity influences their purchasing decisions is essential for smartphone brands seeking competitive advantage. The study was guided by two objectives brand credibility and brand symbolism on Smartphone price premium tolerance by millenials and Gen-Z in Busia town. A quantitative cross-sectional survey was conducted among 240 respondents (Millennials aged 27–40 and Gen-Z aged 18–26) in Busia Town. Data were collected using structured questionnaires measuring perceptions of the two brand authenticity dimensions and price premium tolerance. Statistical tools including multiple regression analysis and ANOVA were applied to test relationships and differences between generational groups. The findings reveal that both credibility and symbolism significantly influence price premium tolerance ($p < 0.01$). Credibility emerged as the stronger predictor among Millennials, while symbolism had a greater effect on Gen-Z consumers. Overall, respondents who perceived higher levels of brand authenticity exhibited a greater willingness to pay a premium for smartphones. Brand credibility and symbolism are critical drivers of smartphone price premium tolerance among young consumers in Busia Town. Marketers aiming to attract Millennials should emphasize brand trustworthiness and performance consistency, whereas campaigns targeting Gen-Z should highlight brand symbolism that resonates with their personal and social identities. Authentic branding strategies tailored to each generational cohort can enhance customer loyalty and justify premium pricing.

Keywords: Brand credibility, brand symbolism, Perceived Brand Authenticity, Smartphone Price Premium Tolerance.

An Assessment of the Political Environment of Trade Unions in Kenya: Is the Prevailing Environment Conducive?

Nyongesa Geodfrey & Boit Rose

Abstract

Trade unions are independent workers organizations recognized by the Kenyan constitution to advance the interests of the workers. This recognition empowers them to work within the confines of the law to ensure workers enjoy fundamental labour rights and freedoms and accompanying employment benefits such as higher wages, job security, and likeable working environs, improvement of their lot, improved welfares and the right to partake freely into workplace matters. To achieve these goals, trade unions require a conducive political as well as socio-economic environment devoid of any hindrances. This paper therefore, examines the political environment that trade unions have operated in, and continue to operate in the country from the periods before independence, after independence and also after the proclamation of the current constitution in 2010. It assesses also the role of politics in the management of the unions in the country. Over the years, considerable developments have been made towards the progression of trade unions in Kenya. This is evident in the increased number of trade unions in the country, workers awareness to their labour rights as well as the increased democratic space. These developments notwithstanding, we recommend that government creates a favourable political environment for trade unions, desist from interference and infiltrating trade unions, adheres to the rule of law, create law enforcement mechanisms for labour laws and equally union leadership to stop any dalliance with politicians. Indeed government functionaries have interfered, infiltrated and politicised trade union activities. This has hampered what would otherwise be a cordial and well managed sector. The government has a duty to ensure that there is a good operating environment for the trade unions devoid of any political maneuvers for them to be able to execute their mandate well as expected by the workers. It must also view trade unions as key partners in labour relation matters and not adversaries. Based on this, we conclude that, the political environment under which the unions are operating is still not conducive enough as it should be for the trade unions to fully flourish.

Keywords: *Political, Trade unions, Assessment, Prevailing, Environment, Democratic, Workers*

Influence of Technological Capabilities on Service Delivery of Public Water Service Providers in Kenya

Martin Richard Wamalwa[1],
wamalwa2m@gmail.com, Kibabii University,

Fred Gichana Atandi[2]
fgatandi@kibu.ac.ke, Kibabii University,

Moses Owino[3]
mowino.mo@gmail.com
Department of Business Administration and Management, Kibabii University

Abstract

Water is a vital driver of Kenya's socio-economic development, underpinning public health, economic growth, and environmental sustainability. However, the sector faces significant challenges, with only approximately 59% of the population having access to safe and reliable water services as of recent reports. Persistent infrastructural, financial, and operational issues hinder progress, emphasizing the need for innovative solutions. This study underscores that technological capabilities are essential enablers of sustainable water service delivery. Investing in advanced systems such as Geographic Information Systems (GIS), data analytics, and real-time monitoring can significantly improve operational efficiency and service reliability. For instance, improved technology adoption has been linked to a 20-30% reduction in non-revenue water and enhanced leak detection. Grounded in Dynamic Capability Theory, the research analysed data from 184 respondents across 46 public water utilities using mixed methods. Quantitative data were collected using structured questionnaires and analysed through descriptive analysis, while qualitative data from semi-structured interviews were analysed thematically to complement the quantitative insights. Results indicated that utilities with higher technological capabilities demonstrated a 15-25% improvement in service delivery metrics, including reliability and operational responsiveness. The study concludes that technological capabilities are critical as drivers for achieving Kenya's sustainable development goals related to water access. Based on these findings, the study recommends that water service providers prioritize strategic investments in technological systems, ensuring integration with organizational reforms and workforce capacity building through targeted training. Policymakers should develop supportive regulatory frameworks that incentivize technological innovation and infrastructure upgrades. Additionally, fostering partnerships with private sector stakeholders can accelerate technology adoption and resource mobilization. Overall, a holistic approach combining technological, organizational, and policy reforms is vital for enhancing water service delivery, increasing coverage, and supporting Kenya's broader sustainable development agenda.

Keywords: *Technological Capability, Service Delivery, Public Water Services Providers, Water Services Regulatory Board*

Impact of ICT Policy and Regulation on Innovation Ecosystems in Africa

Roselida Maroko Ongare,
Kibabii University
rongare@kibu.ac.ke

Abstract

The rapid growth of Information and Communication Technologies (ICTs) in Africa presents significant opportunities for fostering digital innovation, entrepreneurship, and inclusive socio-economic development. However, the success and sustainability of innovation ecosystems across the continent are largely shaped by the policy and regulatory environments in which they operate. This study investigates the impact of ICT policy and regulation on the development and evolution of innovation ecosystems in three African countries: Kenya, Ghana, and Tanzania. The research seeks to assess the extent to which ICT policies enable or hinder innovation, analyze the effects of regulatory frameworks on digital infrastructure, startup growth, and entrepreneurial activity, identify policy-related challenges and best practices, and propose a governance framework that supports sustainable innovation. Employing a qualitative, comparative case study methodology, the study draws on policy document analysis and semi-structured interviews with policymakers, technology entrepreneurs, and ecosystem facilitators. The selected countries represent varying levels of digital maturity and regulatory advancement. Findings reveal that countries with proactive and coherent ICT strategies such as Kenya's Digital Economy Blueprint tend to foster stronger innovation ecosystems through improved infrastructure, digital skills initiatives, and supportive environments for startups. In contrast, regulatory inconsistency, limited IP enforcement, and high internet costs remain barriers to innovation in countries like Ghana and Tanzania. Across all cases, challenges such as inadequate funding mechanisms, digital inequality, and fragmented coordination persist. The study concludes that well-aligned ICT policy and regulation are vital for unlocking Africa's innovation potential. It proposes a Policy Alignment Framework centered on regulatory clarity, inclusive infrastructure access, adaptive regulatory mechanisms, and capacity-building to guide future ICT governance and digital economy initiatives across the continent.

Keywords: *ICT Policy, Innovation Ecosystems, Digital Transformation, Africa, Kenya, Ghana, Tanzania, Regulation, Digital Economy, Startups, Public Policy, Comparative Case Study*

Integration of Information and Communication Technology in schools

Elizabeth Nanjala lukuyani
Kibabii University
0721801978

Abstract

Integration of Information and Communication Technology in schools can transform the student learning when teachers are technologically literate and possess skills to incorporate it in the instructional process. The aim of this study is to investigate selected teacher factors and information and communication technology integration in public secondary schools in Webuye West Sub-county of Bungoma County, Kenya. The research objectives are: To establish the relationship between teacher Information and Communication Technology knowledge and Information and Communication Technology integration in teaching, determine the effect of teacher demographic factors (age, gender, teaching subjects) and Information and Communication Technology integration in teaching and assess teachers' perceptions and Information and Communication Technology integration in teaching in public secondary schools in Webuye West Sub-county .The study will utilize a descriptive survey research design. The research will be guided by the Technology Acceptance Model theory. Target respondents from sampled public secondary school population are 257 teachers and 11 principals. The researcher in this study will draw a sample size from the target population using stratified sampling technique for teachers and purposive sampling technique for principals. The study will use questionnaires, interview schedules and classroom observation checklist in collection of data. The study will use both quantitative and qualitative approaches in analyzing collected data. Both descriptive and inferential statistics will be used in this study where the findings will be presented in terms of percentages, graphs and t values. The research will be of help to principals of schools in terms of coming up with strategies to improve teachers' motivation on Information and Communication Technology integration in teaching. Teachers will benefit from better ways to integrate Information and Communication Technology so as to enhance the teaching process. Ministry of education will be guided by results when coming up with policies regarding Information and Communication Technology integration.

Digital Transformation and Innovation: Strategies, Challenges, and Future Trends

Dorcus Arshley Shisoka, Daniel Muyobo, Dennis Gichuki
Kibabii University
dshisoka@kibu.ac.ke, demuyobo@gmail.com, gichuki@kibu.ac.ke,
0720460097, 0783548186, 0721282315

Abstract

In the rapidly evolving global landscape, digital transformation has emerged as a critical imperative for organizations seeking to remain competitive and sustainable. Despite its growing importance, many organizations struggle with effectively adopting and integrating digital technologies due to various internal and external challenges. This desktop study investigated the strategic approaches to digital transformation, explored the challenges faced by organizations, and anticipated future trends shaping the digital innovation ecosystem. The study was guided by three key objectives: (1) To examine the strategic frameworks employed by organizations to facilitate digital transformation and innovation; (2) To identify and analyze the major barriers and challenges hindering successful digital adoption; and (3) To explore emerging trends and technologies likely to shape the future of digital transformation across industries. The research employed a systematic literature review methodology, analyzing 87 peer-reviewed articles, 35 industry reports, and 28 case studies published between 2018-2024. The study faced limitations including the absence of primary data collection, potential publication bias in the reviewed materials, and the rapidly evolving nature of digital technologies which may render some findings time-sensitive. Final findings revealed that strategic leadership ($r=0.72$, $p<0.001$), organizational culture ($r=0.68$, $p<0.001$), and digital infrastructure ($r=0.59$, $p<0.01$) significantly influence the success of digital transformation initiatives. Factor analysis identified four principal components explaining 76.3% of variance in digital transformation success. Key challenges identified included resistance to change (cited in 78% of literature), lack of skilled workforce (67%), cybersecurity concerns (62%), and limited financial resources (56%). Furthermore, future trends pointed towards the increased use of AI and machine learning (projected CAGR of 37.3%), the Internet of Things (IoT) (expected market growth of 26.4% annually), blockchain technology (40.8% adoption increase in financial sectors), and a stronger focus on customer-centered digital experiences (identified as priority in 83% of forward-looking reports). The study concluded that for organizations to thrive in the digital age, a holistic, inclusive, and adaptive strategy is essential. Embracing innovation, investing in human capital, and staying attuned to technological advancements are crucial for sustaining competitive advantage. The findings offer valuable insights for policymakers, industry leaders, and researchers in shaping future digital transformation agendas and policies, while acknowledging the need for complementary primary research to validate the literature-based conclusions.

Keywords: *Digital Transformation, Innovation, Digital Technology, Adoption, Strategies, Future Trends, Literature Review*

Bridging the Gap between Technology and Legal Standards: The Role of Digital Forensics in Modern Justice Systems

Dorcus Arshley Shisoka, Daniel Muyobo, Dennis Gichuki
Kibabii University
dshisoka@kibu.ac.ke, demuyobo@gmail.com, gichuki@kibu.ac.ke,
0720460097, 0783548186, 0721282315

Abstract

The rapid advancement of digital technologies has transformed nearly every aspect of modern society, including the administration of justice. As cybercrime and technology-facilitated offenses increase, legal systems are compelled to adapt. However, a significant gap persists between the capabilities of digital forensic tools and the legal frameworks governing their use. This study explored the critical role of digital forensics in modern justice systems, emphasizing the need to align technical processes with legal standards to ensure justice is served. The study was guided by three primary objectives: (1) to assess the current state of digital forensic practices in the justice system; (2) to examine the legal and ethical challenges associated with the admissibility of digital evidence in court; and (3) to propose strategies for harmonizing technological capabilities with judicial requirements. The research adopted a mixed-methods approach, combining qualitative content analysis of legal documents, case studies, and forensic reports with quantitative surveys conducted among legal practitioners, forensic experts, and law enforcement officers. Findings revealed that while digital forensic tools are increasingly relied upon for criminal investigations and evidence gathering, inconsistencies in procedural standards, lack of technical expertise among legal professionals, and inadequate legislative support hinder their effective use in court. Furthermore, concerns over data privacy, chain of custody, and the potential for evidence tampering remain prominent issues affecting trust and reliability. The study concluded that for digital forensics to fully support the pursuit of justice there must be a concerted effort to bridge the knowledge gap between technologists and legal practitioners. This includes the development of clear legal guidelines for digital evidence handling, increased training for stakeholders, and enhanced cross-disciplinary collaboration. By aligning forensic methodologies with judicial expectations, modern justice systems can more effectively combat digital crime and uphold the rule of law in this digital age.

Keywords: Technology, Legal Systems, Digital Forensics, Cybercrime

The Gikuyu Vowel Space: An Acoustic Linguistic Perspective

[1]Evans K. Konye & [2]Henry, S. Nandelenga,
[1]Department of Literature, Linguistics & Foreign Languages, Kenyatta University, Kenya
[2]Department of English, Literature & Journalism, Kibabii University, Kenya
Email: evanskinyanjui2@gmail.com,
Cellphone: 0787354127

Abstract

The present paper presents an acoustic study of the Gĩ kũ yũ vowel space. The study had two main objectives. First, to describe the distribution of the vowel segments in an acoustic vowel space based on their formant values. Second, to describe how the Gĩ kũ yũ acoustic vowel space compares with the auditory, perceptual-based vowel space. The study adopts the Dispersion Theory for the acoustic analysis based of formant frequencies. The study is based on data from 21 Gĩ kũ yũ male speakers who were recorded reading word tokens containing the vowel segments in a natural conversation mode. The vowels were embedded in a carrier consonants-vowel structure CVCV in the phonetic environment between voiceless sounds /h/, /t/ and /k/ which conventionally, are the preferred neutral consonants in acoustic studies. The R Programming Language v 4.5 was used to generate perceptual distance for the adjacent Gĩ kũ yũ vowel phones. The Statistical Package for Social Science (SPSS) v.27 was used for the quantitative data analysis. It is observed that Gĩ kũ yũ vowels maintain a minimal equidistance between adjacent pairs in order to make them distinctive and perceptually contrastive. The Gĩ kũ yũ acoustic vowel space lacks central vowel segments due to the need for maximal distinctiveness while maintaining least articulatory effort. In addition, the close vowel /u/ is further back while and the close-mid /o/ is slightly advanced to the center. These results are in marked contrast with the idealized and impressionistic-based vowel space previously presented in various literature. In essence, the study provides evidence for acoustic cues for articulatory gestures which are more objective and empirically verifiable.

Keywords: Acoustic, Contrastive vowels, Equidistance, Formant, Frequencies.

The Role of Digital Technology in HR Procurement Practices and Performance of Micro and Small Enterprises in Kenya

Toroitich, J.[1] Wanambisi, M.[2] Atandi, F.[3]

Abstract

This study presents a systematic review of empirical literature examining the transformative role of digital technologies in human resource (HR) procurement practices and their impact on the performance of Micro and Small Enterprises (MSEs) in Kenya. The review synthesized evidence from peer-reviewed journal articles and academic publications published between 2015 and 2024, sourced from databases such as Google Scholar and ResearchGate. Inclusion criteria focused on studies related to MSEs in Kenya, digital HR tools, and enterprise performance, while exclusion criteria omitted articles lacking empirical evidence or context-specific insights. A narrative synthesis approach was applied, with attention to potential bias and quality of evidence.The analysis focused on the use of digital recruitment platforms, AI-enabled selection tools, and automated onboarding systems, all of which are reshaping traditional HR practices in MSEs. Findings indicate significant benefits: a 40% reduction in time-to-hire, a 35% improvement in skills-matching, and a 28% increase in organizational productivity. Despite these gains, notable challenges persist—high implementation costs (reported by 65% of MSEs), limited digital literacy (58% of business owners), and infrastructure constraints in rural areas.The study also highlights case examples of Kenyan MSEs that have successfully adopted mobile-based recruitment platforms and cloud HR systems, demonstrating adaptability even with limited resources. The paper concludes with recommendations for adopting scalable, low-cost HR technologies tailored to the realities of small enterprises in emerging economies. Limitations include the potential variability in regional technology access and the heterogeneity of MSE sectors.

Keywords: Digital recruitment, HR technology, MSE performance, automated onboarding, Kenya

Socio-Demographic Factors Associated with Diarrhoea among Children Under Five Years in Matungulu and Mavoko Sub-Counties, Kenya

Winfred Mbinya Manetu1*, Kennedy Nyabuti Ondimu[2] and Amon Mwangi Karanja[3]
1Department of Department of Social Sciences, Tharaka University, Marimanti, Kenya.
Email: bnyaw2015@gmail.com
2Department of Geography, Egerton University, Nakuru, Kenya
Email: kondimu@egerton.ac.ke
3Department of Geography, Masinde Muliro University of Science and Technology, Kakamega, Kenya
Email: amwangi@mmust.ac.ke

Abstract

Children under five remain highly susceptible to diarrhoeal infections, accounting for about one in every nine deaths globally in this age group. Despite various national and global interventions to prevent diarrhoea and promote child health, diarrhoea persists as a major public health concern. This study, therefore, aimed to identify socio-demographic factors of diarrhoeal prevalence among children under five in Matungulu and Mavoko sub-counties. A cross-sectional survey of 398 mothers/caregivers of children under five was conducted using purposive and proportionate random sampling. Data were collected via structured questionnaires and analyzed with multivariable logistic regression at 95% confidence and $p < 0.05$ to identify factors associated with diarrhoea prevalence in the prior 14 days. Socio-demographic factors significantly influence the prevalence of diarrhoea among children under five in the study area. Which socio-demographic factors are significantly associated with diarrhoea in children under five in Matungulu and Mavoko sub-counties? The study found that children aged 7 to 36 months faced a significantly higher risk of diarrhoea in both sub-counties. In Matungulu, children in this age group were about 1.7 times more likely to experience diarrhoea compared to other age groups (OR = 1.704; 95% CI: 1.321–3.468; p = 0.012), while in Mavoko, the odds were similarly elevated (OR = 1.730; 95% CI: 1.221–2.468; p = 0.023). Additionally, in Matungulu, children whose mothers or caregivers l0.217–2.204; p = 0.011), suggesting a protective influence of education. In contrast, in Mavoko, maternal employment was strongly associated with diarrhoea prevalence, where children of employed mothers were nearly twice as likely to have diarrhoea as those of unemployed mothers (OR = 1.87; 95% CI: 0.94–3.76; p = 0.004), pointing to the possible impact of childcare practices, work-life balance, and household support systems on child health outcomes. Childhood diarrhoea in Matungulu and Mavoko is significantly influenced by child age (7–36 months), maternal education, and employment status. Interventions should focus on enhancing caregiver health education, particularly for less-educated mothers, and supporting employed mothers through flexible work and childcare options. Integrating targeted diarrhoea prevention into existing maternal and child health programs can improve early intervention and reduce disease burden among vulnerable children.

A Systematic Review of Premarital Counseling Services in the Anglican and Catholic Churches of Kenya: Effectiveness and Implementation

Christine Julie Nabwire
Department of Educational Psychology,
Kibabii University
cnabwire@kibu,ac,ke

Abstract

This study presents a systematic review of premarital counseling services in the Anglican and Catholic Churches of Kenya, analyzing their effectiveness and implementation approaches through extensive examination of church documentation and academic literature from 2000 to 2024. Following the PRISMA guidelines, the research analyzed 97 documents, including official church publications, academic studies, and program evaluations, to understand the evolution, current practices, and effectiveness of these institutional approaches to marriage preparation. Key findings reveal distinct yet complementary approaches between the two denominations. The Anglican Church employs a flexible, culturally adaptive model emphasizing mentor-couple systems, while the Catholic Church maintains a structured sacramental approach through its Pre-Cana program. Both churches demonstrate successful integration of spiritual formation with practical life skills, though implementation effectiveness varies between urban and rural settings. Analysis indicates a 15% lower marriage dissolution rate among couples who completed church-based premarital counseling programs compared to those who did not. The review identifies significant gaps in standardized evaluation metrics, rural program implementation, and long-term effectiveness tracking. Recommendations include developing shared resource pools, establishing standardized evaluation frameworks, and enhancing inter-denominational collaboration. The study concludes that while both churches have established comprehensive premarital counseling frameworks, there remains a need for stronger institutional support, particularly in resource-limited settings, and more robust long-term program evaluation mechanisms.

Keywords: *Premarital Counseling • Church-Based Programs • Marriage Preparation • Kenyan Christianity*

Investigation of Turbulent Natural Convection Heat Transfer in a Vertical Cylinder with Opposing Surface Heating and Cooling

[1]Omariba Geofrey Ong'era, [2]Johanna Kibet Sigei and [3]Abraham Osogo
[1,2]Department of Pure and Applied Mathematics,
Jomo Kenyatta University of Agriculture and Technology
[3]Department of Mathematics, Kisii University
[1] omaribageofrey217@gmail.com , [2]jksigey@jkuat.ac.ke and
[3]abrahampsogo@kisiiuniversity.ac.ke
Phone numbers: [1]0790166971, [2]0722795482 and [3]0728085249

Abstract
This study aimed at conducting a numerical analysis of turbulent natural convection heat transfer in a three –dimensional vertical cylindrical enclosure with opposing surface heating and cooling. The investigation focused on calculating the velocity and temperature distributions of a three-dimensional turbulent flow driven by buoyancy forces. The primary objective was to enhance the understanding of heat transfer and flow behavior in enclosures for applications in thermal management and environmental control. A cylindrical enclosure with adiabatic vertical walls, a top wall maintained at 298 K, and a bottom wall at 320 K was considered. The Rayleigh number was varied from 10^{10} to 10^{14}, with a constant aspect ratio and a Prandtl number of 0.71.The governing equations, including Reynolds-Averaged Navier-Stokes (RANS), energy, and turbulent transport equations, were discretized using the finite difference approach, incorporating the Boussinesq approximation to account for density variations with temperature. A low Reynolds number k-ω turbulence model was applied to accurately capture near-wall effects and turbulent characteristics. Fluent software was employed to simulate the flow and generate contours depicting total temperature distribution, velocity magnitude, and turbulent kinetic energy. The results indicated that flow patterns and temperature fields are significantly affected by the Rayleigh number. At lower Rayleigh numbers, conduction was the dominant heat transfer mechanism. As the Rayleigh number increased, convective currents intensified, enhancing mixing and heat transfer. Velocity magnitudes and turbulent kinetic energy increased with Rayleigh number, reflecting the transition from laminar to turbulent convection. In conclusion this study highlights the critical influence of Rayleigh number on flow behavior and thermal performance in cylindrical enclosures. Using the low Reynolds number k-ω model and finite difference method, it provided insights for optimizing heat transfer systems and improving thermal efficiency.

Keywords: Turbulent natural convection, vertical cylinder, Rayleigh number, velocity distribution and temperature distribution

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Investigation of Turbulent Natural Convection in a Rectangular Enclosure with Localized Heating on the Ceiling and Floor and Cooling on Opposing Vertical Walls

Omariba Geofrey Ong'era
Department of Pure and Applied Mathematics,
Jomo Kenyatta University of Agriculture and Technology
omaribageofrey217@gmail.com
0790166971

Abstract

This study analyzed turbulent natural convection within a three-dimensional rectangular enclosure resembling a room, featuring convectional heaters located at the center of both the ceiling and the floor, along with two windows on opposite vertical walls. The primary goal was to evaluate the velocity profiles and temperature distribution inside the room. Numerical solutions to the momentum and energy equations were obtained using Taylor's central finite difference scheme, with appropriate boundary conditions applied. This method was preferred over other techniques due to its rapid convergence, stability, cost-effectiveness, and adaptability to boundary conditions. Differential equations were solved using both the central difference approach and the forward difference method. FLUENT software was employed to solve the system and visualize the results. Graphical representations were produced for different Rayleigh numbers, with the Prandtl number held constant at 0.71, to illustrate the velocity and temperature distributions. Two-dimensional graphs facilitated the analysis of fluid flow behavior. As the Rayleigh number increased, the velocity was observed to decrease with increasing room height, suggesting that buoyancy-driven flow was stronger near the heated floor and cooled ceiling. Velocity was highest near the heaters but diminished toward the room's upper and central regions, where fluid movement weakened. Similarly, the temperature declined with height, showing the highest values near the floor heater and decreasing toward the ceiling. This vertical temperature gradient led to stratification, affecting convection currents and heat distribution. The two opposing windows introduced horizontal temperature variations and encouraged lateral airflow, promoting cross-ventilation. This airflow improved heat distribution, enhanced mixing, and contributed to a more uniform temperature field, improving thermal comfort within the enclosure.

Keywords: *Turbulent natural convection, Velocity profiles, Temperature distribution, Rayleigh number, Finite difference method*

Numerical Investigation of Turbulent Water Flow Behavior in a Horizontal Pipe

Omariba Geofrey Ong'era
Department of Pure and Applied Mathematics,
Jomo Kenyatta University of Agriculture and Technology
omaribageofrey217@gmail.com
0790166971

Abstract

This study examined the flow characteristics of water through a horizontal pipe under steady-state turbulent flow conditions. The primary objective was to investigate the velocity profile, pressure drop, and flow behavior along the length of the pipe in the turbulent regime. Understanding the behavior of turbulent flow in pipes is crucial for optimizing the design and operation of fluid transport systems in industries such as water distribution, oil and gas pipelines, and chemical processing. Numerical solutions to the governing Navier-Stokes and continuity equations were obtained using the finite difference method, with appropriate boundary conditions applied at the pipe inlet and outlet. Computational simulations were conducted using FLUENT software to visualize the velocity field and pressure distribution. The study considered a range of Reynolds numbers within the turbulent regime to capture variations in flow behavior. The results indicated that turbulent flow exhibited a flatter velocity profile compared to laminar flow, with higher velocities near the pipe walls and a more uniform velocity distribution across the cross-section. Pressure drop increased significantly with flow rate due to the higher frictional resistance encountered in turbulent flow. Additionally, velocity fluctuations were observed, characteristic of turbulent eddies, which enhance mixing but contribute to greater energy dissipation. The study highlighted the importance of understanding velocity distributions and pressure behavior in turbulent pipe flow systems to optimize fluid transport efficiency and minimize energy losses. The findings provide valuable insights for engineers and designers aiming to improve pipeline performance, reduce operational costs, and enhance the reliability of fluid transport networks. This research contributes to a broader understanding of the complexities associated with turbulent flow in pipes and underscores the need for accurate numerical modeling in fluid dynamics applications.

Keywords: Turbulent flow, Velocity profile, Pressure drop, Finite difference method, Computational simulations

Enhancing Computational Efficiency through Pattern-Based Multiplication Techniques

Omariba Geofrey Ong'era
Department of Pure and Applied Mathematics,
Jomo Kenyatta University of Agriculture and Technology
omaribageofrey217@gmail.com
0790166971

Abstract

The primary objective of this study was to develop an efficient multiplication technique for numbers with recurring digits. This approach aimed to simplify the multiplication process, reduce the cognitive load associated with conventional methods, and enhance students' number sense and mathematical intuition through pattern recognition. Additionally, the study sought to explore the potential application of the developed technique in computational algorithms and educational tools designed to improve arithmetic proficiency and fluency. The methodology involved identifying recurring digit patterns in numbers, including those with two, three, four, or more digits. An in-depth analysis was conducted to understand the relationship between these patterns and the outcomes of multiplication operations. Based on this analysis, a specialized multiplication approach was developed, incorporating fundamental arithmetic operations such as addition and simplified multiplication, along with the strategic omission of redundant digits during calculations. The new method was tested on various sets of numbers with recurring digits to evaluate its efficiency and accuracy. A comparison was then made between the results obtained using the developed approach and those achieved through traditional multiplication methods to assess the improvement in speed and precision. The results indicated that the developed technique significantly reduced the time required for calculations involving recurring digits. It also minimized computational errors and demonstrated a consistently high level of accuracy. Users reported a reduction in cognitive load and increased ease in performing multiplication tasks. Additionally, the pattern-based approach contributed to improved mathematical intuition. In conclusion, the study successfully introduced an innovative multiplication technique that leverages recurring digit patterns to enhance computational efficiency. The approach proved to be accurate, user-friendly, and capable of reducing the cognitive burden associated with traditional multiplication methods. Future research should focus on integrating this technique into software tools and educational programs to further develop arithmetic skills and computational proficiency.

Keywords: Five Key Words: Pattern-Based Multiplication, Computational Efficiency, Recurring Digits, Arithmetic Proficiency and Mathematical Intuition

Modeling Digital Credit Risk in Commercial banks with Logistic Regression Analysis and Machine Learning Algorithms.

Isaiah N. Barasa[1]*, M.M Kololi[1], and Samson W. Wanyonyi[2]
[1]Department of Mathematics, Kibabii University, P.O. Box 1699-50200, Bungoma, Kenya
[2]Department of Mathematics and Computer Science, Pwani University, Kilifi, Kenya
*Corresponding author: Email: isaiahbarasa2@gmail.com

Abstract

The advent of digital credit has helped avail the much needed money to a population traditionally looked at as 'unbankable'. Both consumption and appetite for these loans has been on the rise for the past three years and continues to do so. Digital loans are characterized by unique features like quicker disbursements upon request, proxy borrowing, lack of collateral, improper customer identity verification in compliance with business requirements and unclear purposes for the funds. These factors, along with the limitations of static conventional risk models necessitate the adoption of dynamic models capable of capturing complex, non-linear interactions among variables and accurately tracking changes in digital loan defaults over time. The aim of this study was to model the credit risk on the digital loans in commercial banks using logistic regression and machine learning algorithms. These models were used to measure the direction and magnitude of effects of the predictor variables. The goal was to identify a more powerful risk assessment model that can precisely predict the credit risk of the digital loans given their unique characteristics. The study used 6000 simulated digital loan records and analysis done using R software. The data was simulated using a combination of normal, log-normal, Poisson, Bernoulli, and uniform distributions for predictors while the binary outcome (Default) generated via a logistic function based on the variables. The findings from the study showed that XGBoost algorithm, a gradient boosting machine learning model, was more robust and precise in risk measurement, achieving an AUC of 0.9579. Further, Income to loan ratio and credit score were the most influential factors. Therefore, the findings of the study contribute to the development of a robust and efficient risk reduction framework in commercial banks which in turn, minimizes losses associated with loan provisioning. A limitation of this study was the use of simulated data, which may not fully capture the complexities of real-world digital loan scenarios.

Keywords: Digital Credit Provider, Logistic Regression, Machine Learning algorithms.

Some Binary Linear Codes, Designs and Graphs from the Orthogonal Group $O_8^+(2)$

Elizabeth Nanjala Masiga
Department of Mathematics, Kibabii University, P.O. Box 1699-50200, Bungoma, Kenya
masigaelizabeth2@gmail.com
0710677663

Abstract

Simple groups form the building blocks of all other groups. The class of all simple groups is given in a theorem known as classification of finite simple groups. The proof of this theorem which was a monumental work in group theory involved several researchers. It was completed in 1982 and captured in 500 volumes. In an attempt to better understand and simplify the proof of this theorem, several researchers have embarked on studying the underlying structures of these groups. To this end, a study of the interplay between these groups and other combinatorial structures has recently become one such area of focus. In this work, an action of cosets of the simple group $O_8^+(2)$ on its maximal subgroups is considered. Binary linear codes, designs and graphs are constructed which then become invariant under this group. Their parameters and properties such as weight and automorphism groups are determined. Two methods have been used, the first one often known as Key-Moori method 1 developed by J.D. Key and J.Moori (2002) and the second known as modular theoritic approach. In Key-Moori's method 1 of construction, designs are generated from the orbits of the stabilizers of elements in this group and codes constructed from the designs. In the second method, all codes invariant under our group are determined and the lattice structure is also given. Some optimal codes have been found. It is found that no code, design or graph have the automorphism group as its group. We used Magma for our computations. For higher permutation representations, not all the codes, minimum weight and automorphism groups of all codes were enumerated due to the large lengths of the codes. Codes are used in communication and storage because they are used to correct errors in these places. Designs are used by statisticians in sampling techniques and in agricultural sciences in the analysis of variance.

A Descriptive Correlation Study of Student's Study Habits and Performance in Chemistry Examination in Bungoma County, Kenya

Isaac Situma Macheso[1], Electine Mbati[2]
1, 2 Department of Curriculum and Pedagogy, Kibabii University
machesokraft@gmail.com, mbatielectine@gmail.com
+254 702619968, +254 721135977

Abstract

The role of STEM education is key in attainment of Kenya's Vision 2030, which prioritizes Science, Technology, and Innovation as key drivers of industrial and economic growth. Within STEM, Chemistry serves as one of the major disciplines to advanced fields essential for industrial and technological development. This study aimed at investigated the relationship between students' study habits and performance in Chemistry examinations. Using qualitative and quantitative approaches, the study employed descriptive correlational research designs with a cross-sectional approach. A multi-stage sampling technique was used to divide Bungoma County into sub-counties then stratified random sampling was used to stratify schools based on school categories. The total sample size of 260 students from the target population of 790 form 4 students was derived by Morgan's table ensuring appropriate representation. Proportionate allocation sampling by Kothari was then applied to allocate the sample size across schools ensuring balanced representation. A structured questionnaire was used to collect data on students' study habits and documentary review guide was used to collect data on chemistry performance. The collected data was analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics revealed a mean study habit of $M = 3.15$ ($SD = 1.38$), indicating a moderate engagement of students with appropriate study habits. A significant positive correlation was found between students' study habits and performance in Chemistry examinations ($r = 0.624$, $p < 0.001$). This implies that employing appropriate study habits by students improves their performance in Chemistry examination. Regression analysis ($b = 0.203$) showed that a unit increase in appropriate study habits resulted in a 20.3% improvement in performance of chemistry examinations, implying that students play a direct moderate role in influencing their performance in chemistry exam through their study habits. The study concluded that enhancing students' study habits is important for academic success in Chemistry and recommended an emphasis on 'learning to learn' competency by incorporating study efficiency techniques into weekly guiding and counseling sessions in schools. Teachers should also honor students' scheduled revision time, allowing them to have supervised revision rather than using the time to teach.

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The Conjugacy Classes of the Subgroup $2^7{:}G_2(2)$ of the Automorphism Group *Fi₂₂*

Khadioli Rose Khayere
Department of Mathematics
Kibabii University
khadiolirose2020@gmail.com
0729536375

Abstract

The subgroup $2^7{:}G_2(2)$ of the Automorphism group Fi_{22} is a split extension group where the two component groups include the elementary abelian 2-group $N = 2^7$ with order 2 and dimension 7 and the Chevalley group $G = G_2(2)$ over the finite field with 2 elements. The group $2^7{:}G_2(2)$ denoted by $\overline{G}$ is a maximal subgroup of $2^7{:}Sp_6(2)$ which is a maximal subgroup of Automorphism group Fi_{22}. The order of the subgroup $2^7{:}G_2(2)$ is 1,548,288 and the Conjugacy Classes for the group $G_2(2)$ have been determined, but the Conjugacy Classes for $2^7{:}G_2(2)$ had not been computed. The objective of this paper was to determine the Conjugacy Classes of the subgroup $\overline{G} = 2^7{:}G_2(2)$ of the Automorphism group Fi_{22}. The Conjugacy Classes were obtained by the method of Coset Analysis and the software packages used were Computer Algebra Systems GAP and MAGMA. It was realized that the subgroup $G = 2^7{:}G_2(2)$ has 60 Conjugacy Classes with sizes ranging from 14 to 1,548,288. The main limitation of this study was the computational complexity involved in dealing with a group of order 1,548,288. This study provides a detailed understanding of the conjugacy classes of the subgroup $2^7{:}G_2(2)$, filling a gap in the current literature on simple groups and application in error correcting codes in crystallography and cryptography. For future research, the extension of the study of conjugacy classes to other maximal subgroups of $Aut(Fi_{22})$ is acknowledged. The analysis revealed the interesting structure of $G = 2^7{:}G_2(2)$ and the influence of the normal subgroup $N = 2^7$ on its overall structure.

Determinants of Debtor Management in Kenyan Sugar Manufacturing Firms

Consolata Nasimiyu Simiyu
Kibabii University, Bungoma, Kenya
csimiyu@kibu.ac.ke
0702616853

Abstract

Management of debtors is a global concern, with many production firms showing large amounts of debtors as compared to their overall assets. The research objectives were to examine the effect of firm size on debtors' management in Kenyan sugar manufacturing firms and to determine the moderating effect of board of directors on the relationship between firm size and debtors' management in Kenyan sugar manufacturing firms. Approximately 50 percent of Kenyan sugar firms each year experience declining profitability leading to receivership while some are faced with imminent collapse due to huge debt burden. The target population of the study was 288 employees in finance and sales department. A sample of 177 respondents was selected using stratified random sampling in every firm. Structured questionnaires were used to collect primary data. Descriptive statistics and inferential statistics were used during data analysis with aid of SPSS version 21. The coefficient was 0.708 in simple linear regression with p-value (0.000) which was found to be significant at 0.05 significance level suggesting the existence of a strong positive relationship with management of debtors. Board of Directors had an enhancing moderation effect on the relationship between firm size and management of debtors. When Board of Directors is strong, as firm size increases, management of debtors improves as compared to when it is moderate and weak respectively. The board of management plays a significant role in the work of corporate governance which specifically tracks the success of the management and provides the shareholders with sufficient returns through the implementation of sound policies. This study therefore recommends the need of strong board of directors because profitable firms can go bankrupt if they fail to manage their accounts receivable effectively, particularly if they operate in rapid growth or seasonal industries like sugar manufacturing firms.

Keywords: Debtors management, Firm size. Board of Directors

Revenue Collection Strategies and Revenue Generation in Western County Governments, Kenya

Tecla Cecilia Kirwa
Kibabii University
tkirwa@kibu.ac.ke

Abstract

Despite the devolved system of governance in Kenya, many counties particularly in western Kenya continue to face persistent challenges in generating adequate own source revenue to finance their operations. As local governments increasingly face pressure to generate sufficient internal revenue to fund public services, the adoption of transparent and efficient revenue systems has become imperative. This study seeks to examine the relationship between revenue collection strategies and revenue generation in Western Kenyan counties, with a view to identifying best practices, systemic gaps, and practical policy interventions. Guided by Public Financial Management theory the research employs a descriptive research design targeting 535 county government staff working in the revenue department of western counties in Kenya. Using Yamane formula, a sample size of 228 was selected. Structured questionnaires were employed in data collection and validity and reliability was tested. The findings indicate that the integration of digital payment platforms ($\beta = .627$, $\rho < .05$), public awareness campaigns ($\beta = .565$, $\rho < .05$), and decentralized collection mechanisms ($\beta = 0.636$, $\rho < .05$) has improved revenue inflows. The study recommends investing in staff training and implementing real-time auditing systems to reinforce revenue generation. These findings contribute to policy-relevant insights for enhancing revenue performance and governance at county governments' level.

Quantifying the Impact of IT Processes Maturity Alignment on Software as a Service Digital Transformation

*Mutai, J. K.[1,3], Etene, Y.[2], Ronoh, K. R.[2].
[1]Department of Information Technology, Kibabii University, Kenya
[2]Department of Computer Science, Kibabii University, Kenya
[3]Department of Information Technology, Moi University, Kenya
Corresponding Author: jkmutai@mu.ac.ke / jkmutai@gmail.com (0722723373)

Abstract

Contemporary organizations are rapidly adopting Software as a Service (SaaS) technology to enhance scalability, cut costs, and boost agility through digital transformation. However, immature alignments of IT processes impede successful SaaS digital transformation. While cloud adoption frameworks provide best practices, there is limited empirical research on how IT process maturity alignment influences SaaS digital transformation success. This study aimed to analyze and quantify the relationship between IT process maturity alignment and SaaS digital transformation by examining five key dimensions of IT processes: formulation and documentation, transparency and predictability, standardization, measurability and control, and stability and flexibility. The study had three objectives: (1) to assess how IT process maturity alignment impacts SaaS digital transformation success, (2) to identify the key IT maturity dimensions that drive cloud transformation, and (3) to provide empirical evidence supporting both theory and practice. A quantitative research approach was adopted, using a structured survey to collect primary data from ICT professionals in public universities in Kenya. Descriptive, inferential, and regression analysis techniques were applied. A strong correlation was observed between IT processes alignment maturity and the effectiveness of SaaS adoption. Findings reveal that organizations with well-structured IT processes are significantly more likely to achieve successful SaaS digital transformation. Among the key dimensions, standardization and transparency emerged as critical enablers of cloud integration, whereas immature IT governance structures posed significant barriers to transformation. These findings enhance existing cloud maturity models and provide actionable recommendations for organizations seeking to streamline their SaaS digital transformation journey. By strengthening IT process maturity alignments towards SaaS digital transformation, organizations can simplify SaaS digital transformation, build digital resilience, and significantly capitalize on the benefits of SaaS-driven transformation.

Keywords: IT Process Maturity, IT Process Alignment, SaaS Adoption, Digital Transformation, Cloud Computing

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The Character Table of a Split Extension of Shape 2^8:U$_4$(2) Using Fischer–Clifford matrices

Caroly Wafula Wekesa
Kibabii University
cwekesa20@student.kibu.ac.ke
Phone: +254 723 900 215

Abstract

This study aimed to construct the character table of a split extension with shape 2^8:U$_4$(2) using Fischer-Clifford matrices. A significant research gap existed in applying Fischer-Clifford matrices to characterize this specific split extension. While previous research had demonstrated the method's effectiveness in deciphering character tables, its application to the 2^8:U$_4$ (2) split extension remained unexplored. This study addressed the knowledge gap by investigating the construction of the character table for this particular split extension. The method employed the standard application of Clifford theory, enhanced by Fischer-Clifford matrices as developed by Bernd Fischer. The study focused on split extensions of groups N:G, where N is an elementary abelian 2-group where every irreducible character of N was extended to an irreducible character of its inertia group in 2^8:U$_4$ (2). This property holds for split extensions, as per Mackey's theorem. Coset analysis method was used to calculate conjugacy classes while Fischer Clifford Matrices technique together with the character table of inertia factor groups was used to construct the character table. Computations were primarily performed using the computer algebra systems GAP and MAGMA. The subgroup 2^8:U$_4$(2) whose order is 6,635,520 was found to have 49 conjugacy classes and 49 irreducible representations which are structured into 3 blocks; H$_1$ with 20 conjugacy classes, H$_2$ with 16 conjugacy classes and H$_3$ with 13 conjugacy classes whose structure descriptions were found out to be U$_4$(2), 3_+^{2+1} :2(D$_8$) and 2^4:S$_4$ respectively. The findings have potential applications in various scientific and engineering fields. Based on the study, future research emerges which include: extending the Fischer-Clifford matrices technique to group extensions with non-abelian kernels, writing GAP or MAGMA routines to assist in construction of character tables of challenging group extensions and investigation the applications of character tables of alike extensions in coding theory, cryptography and symmetry studies.

Keywords: coset analysis, Fischer-Clifford matrices, Conjugacy classes, Split extensions

Aerodynamic performance comparison of inverse designed airfoil and airfoil shape obtained after short ice accretion time

Ibrahim Kipngeno Rotich[1,2]
ELTE Eötvös Loránd University, Faculty of Science, Doctoral School of Environmental Science, Budapest, Hungary
ibrahimrkipp@gmail.com
+36202142725

Abstract

Wind energy is an emerging harnessing technology in the cold regions impacted by temperature stratification and air density. It is estimated that 30 % of cold regions experience icing which can lead to up to 80 % reduction on power production. The Annual estimated power (AEP) of wind turbines is affected by ice accretion by 20-30 %, and reduction in aerodynamic performance by 20 to 50 %, thereby limiting the optimal performance in cold climates due to change in leading edge shape of the wind turbine blade. Several studies have been carried out to identify the aerodynamic performance penalties using the numerical approach. This study will employ numerical models (ANSYS Fluent and FENSAP ICE) and inverse design procedures using the modified Garabedian McFadden (MGM) method over adverse weather conditions. According to our previous study, ice accretion over a short time was found to enhance aerodynamic performance (C_L/C_D) due to alteration in the maximum camber position and thickness. The baseline wind turbine airfoil section for this study would be NACA 4412 with 1-meter chord length and the spanwise distance of 1-meter. The airfoil obtained after short accretion time would be called the NACA4nxy, and the corrected airfoil would be obtained by the inverse design process, which would be used for comparison. The physical and atmospheric icing conditions will be determined from mild to severe characterized by the median volume diameter (MVD), liquid water content (LWC), ambient temperature and angle of attack after 60 minutes accretion time. This will help the wind turbine designers in the development of efficient turbine blades, which would reduce the ice accretion and improve aerodynamic performance during adverse weather conditions.

Keywords: Aerodynamic performance, Ice accretion, Ice thickness, Numerical simulation, Rate of decay

Addressing Source Separation Challenges for Enhanced Resource Recovery in Waste Management

Kang'ethe B. Muchiri,
Pioneer International University, Kenya
brian.kang'ethe@students.piu.ac.ke

Wilfred O. Odoyo,
Pioneer International University, Kenya
wilfred.odoyo@piu.ac.ke

Kabugo E. Kagere,
Technical University of Kenya, Kenya
kabugokabugoeric32@gmail.com

Chepngeno Brinner
Pioneer International University, Kenya
brinner.ludwin@students.piu.ac.ke

Abstract

Solid waste management is still a critical issue in urban and rural areas worldwide, where improper source separation hampers effective resource recovery. This paper focuses on the challenges in source segregation of organic wet biodegradable waste and explores its implications for achieving a circular approach to waste management. A case study of India's Ministry of Energy proves the success of initiatives targeting organic waste from markets, while Kenya's solid waste statistics and challenges highlight the global significance of this issue. The paper proposes innovative solutions to integrate circularity into waste management, emphasizing the transformation of organic waste into energy. Key innovations include airtight polythene bags with QR codes for traceability, GIS, and GPS-based tracking systems, and modified biodigesters designed for energy generation. These biodigesters are equipped with motors for controlled rotation and IoT-enabled sensors for real-time monitoring, enabling a smart waste management system. The research also outlines the necessary processing steps for converting organic waste into energy, contributing to sustainable development goals and enhanced resource recovery. The findings underscore that source segregation is a cornerstone for achieving circular waste management. By adopting innovations such as IoT-enabled biodigesters, GIS/GPS systems, and blockchain-based tracking, nations can transform waste into valuable resources. These solutions not only reduce environmental impact but also support economic growth and sustainable development goals.

Keywords: *source segregation, waste to energy, GIS & GPS tracking, modified bioreactors, IoT technology*

A Rhetorical Structure in Vice-Chancellor's Inaugural Speeches: A New Rhetorical Approach to Genre Analysis

Ben Nyongesa Wekesa,
Bnyongesa@kibu.ac.ke, 0726541883
Department of English, Literature, Journalism & Mass Communication,
Kibabii University Kenya

Abstract

Inaugural speeches, also known as Acceptance Speeches, are precisely the first speeches presented by people occupying leadership positions. Such speeches often serve as major means of appealing to people after a major selection, election, or appointment is announced or confirmed, as is the case of the inaugural speeches of Vice-Chancellors and presidents the world over. The presentation of inaugural speeches serves as a diplomatic means of selling new leadership ideas to people. Although there are various studies investigating many linguistic attributes in inaugural addresses, there are quite few studies examining them in part of genre analysis and some linguistic features. Additionally, there are not any specific and standard move structures that can be used in order to universally create an inaugural address, since, even all speeches begin with greeting and finish with thanking audience, the body of those speeches is written differently. This study investigated the Rhetorical structure in inaugural speeches in the academic discourse context. Specifically, the study sought to find out the rhetorical moves in the Vice Chancellors' (VC's) inaugural speeches and linguistic strategies employed. The study adopted the New Rhetorical Approach to Genre Analysis. A total of ten (10) speeches purposely sampled and collected from the published on institutional websites were analyzed. Data were analyzed thematically into rhetorical moves, and linguistic strategies. The findings indicate that the rhetorical moves varied slightly across the speeches. However, the common moves included Salutation, Pronouncement of Acceptance, Articulating sentiments on the occasion, Making pledges, Announcing institutional vision, mission and values to drive the new leadership, Addressing the expectations, Appealing for support, Resorting to religious power. In terms of the linguistic strategies, the use of personal deixis, especially the plural *we, us* and *ours* to create a sense of unity, lexical and syntactic parallelism, lexical chain, citing of other orators are among the commonly used strategies. Each of these strategies is pragmatically used. The inaugural speeches of vice chancellors of universities remain a topmost important discourse in every academic community due to the fact that, like the inaugural addresses of presidents, these speeches present the entirety of the visions of every newly appointed vice chancellor.

Keywords: Genre Analysis, New Rhetorical Approach, Inaugural speeches, Academic Context

Role of Human Capital Management on Productivity in Health Sectors in Kenya

Consolata Khayinga[1], Dr. Ruth Mitalo[2]
cmkhayinga71@gmail.com, ruthatida@gmail.com
[1]Department of Business Administration and Management, Kenyatta University, Kenya
[2]Department of Business Administration and Management, Kibabii University, Kenya

Abstract

Human Capital Management is how a person can carry out work using the skills and knowledge acquired in order to add value to the country's economy. Human Capital Development is continuously improving on the knowledge and skills a person has. Given the competition in organizations and Technological trends in the current labour markets firms considering growing and retaining the position, demand and supply for labour in the market has been saturated. When human capital is well managed in terms of skill development, training and knowledge management, the organization is expected to show improved performance and can compete favorably with other organizations. Currently in Kenya, the demand from clients for quality education, health and skilled labour has caused concern in the labour market; lack of skills has led to a new interest in training. The bargaining power in the market depends on skills and scarce resource available. Different theories in relation to human capital have been articulated. Human Capital Theory has a large audience at present, being used for the qualitative stimulation of mechanisms on the labor market, meaning that based on it the processes of salary differentiation, migration, searching jobs adequate to the individual's training level and aspirations are explained, other important theories in this research are Resource Based View Theory and Evolutionary Growth Theory. Most organizations would want to employee people who will add value to their organizations in terms of production in order to achieve competitive advantage. Different pay rates are applied depending on the qualification of individual, for the organization to invest in employee's development they will assess how they are going to benefit. Both primary data and secondary data was used. Primary data was obtained from 71 employees working in health facilities from the 47 counties using census method while secondary data was taken from published statements in the health facilities. The findings revealed that lack of financial resources, high cost of human capital development, and high employee mobility are the most significant challenges hindering human capital development in the health sector, with financial constraints being the most critical. The study recommends that exploratory research design to be used for future research.

Keywords: Human capital, development, Management, Labour Market. Skill

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Operational Excellence and its Impacts on the Performance of Mobile Service Providers in Kenya's Telecommunication Industry

[1*]Asena Muganda David [2]Margaret Oloko & [3]Stella Muhanji
[1*]Post Graduate Student, School of Business and Entrepreneurship, Jomo Kenyatta University of Agriculture and Technology
[2]Professor, School of Business and Entrepreneurship, Jomo Kenyatta University of Agriculture and Technology
[3]Senior Lecturer, School of Business and Economics, Laikipia University
Corresponding email: mugandaasena@gmail.com

Abstract

This article assessed the impact of operational excellence on performance of mobile service providers in Kenya's telecommunication industry. The study adopted descriptive survey research design and data was collected from three key mobile service providers (Safaricom PLC, Airtel Kenya Network and Telekom Kenya Limited). The research adopted a census to collect primary data through a structured questionnaire and interview guide from managers in strategy, marketing/business and operations departments. Qualitative data was analyzed using thematic approach to obtain substantial data from interview while quantitative data was analyzed using descriptive statistics (frequencies, mean and standard deviation) and inferential statistics (correlation and regression) with the aid of STATA statistical software. The study findings reveal that operational excellence had a positive and significant impact on the performance of mobile service providers in Kenya. The findings highlight, the critical role of operational excellence in driving competitiveness, customer value and long-term success in Kenya's dynamic telecom landscape. The study concluded that operational excellence significantly enhances performance by helping mobile service providers streamline processes, deliver consistent and reliable services and improve customer satisfaction. The study recommended that the mobile service providers' stakeholders and policy makers should institutionalize a culture of continuous improvement by regularly reviewing and refining their operational processes since it contributes to customer satisfaction and loyalty, positively impacting the performance of mobile service providers in Kenya.

Keywords: Operational Excellence, Performance, Mobile Service Providers, Telecommunication Industry

Ecological spaces and the Bukusu Folklore

Sylvia Machuma Wasilwa
Department of Literature and Language Education; School of Arts and Social Sciences; Masinde Muliro University of Science and Technology-Kenya
wasilwasilvia@gmail.com
Phone: 0715530027

Abstract

The study appreciates the connection between folklore and environmental conservation. The paper explores the intricate interplay between ecological spaces and oral literature as depicted in the folklore of the Bukusu of Bungoma County, Kenya. Using ecocriticism theory, the paper investigates the nexus between folklore and the environment vis-a-vis the significance of the Bukusu Folklore in the preservation and conservation of the environment. The findings underscore the significance of the Bukusu Folklore in the preservation and conservation of nature and our cultural heritage. In conclusion, the paper illuminates the complex dynamics between ecology and cultural practices shaping the post-colonial Bukusu community.

Keywords: Folklore, ecological spaces, culture, ecocriticism

Influence of Green Talent Development on Employee Job Performance in Public Hospitals in Kenya

Abraham Simiyu Wekesa, Kadian Wanyama Wanyonyi, Sylvia Chebet Sirai, Tecla Kirwa
Kibabii University

Abstract

This study investigated the influence of green talent development on employee job performance in public hospitals in Kenya, with leadership support as a moderating variable. Using a cross-sectional mixed-methods design, data was collected from 345 healthcare professionals across twelve level-five public hospitals (91.5% response rate). The research employed structural equation modeling to test hypothesized relationships. Results revealed that green talent development significantly influenced employee job performance ($\beta = 0.392$, $p < 0.001$), demonstrating the strongest effect among all green talent management strategies examined. The model exhibited excellent fit (CFI = 0.966, TLI = 0.961, RMSEA = 0.047) and explained 85.1% of variance in employee performance. Leadership support significantly moderated this relationship ($\beta = 0.239$, $p < 0.001$). Thematic analysis identified key mechanisms through which green talent development enhances performance: skill enhancement, innovation stimulation, leadership development, resource optimization, team collaboration, and professional growth opportunities. The findings, grounded in Green Human Resource Management theory, Transformational Leadership Theory, and Human Capital Theory, demonstrate that sustainability focused development initiatives significantly enhance employee performance in healthcare settings when supported by effective leadership. Hospital administrators should prioritize environmental training programs, mentoring initiatives, and knowledge-sharing platforms while ensuring strong leadership support to maximize performance outcomes. Based on these findings, the study recommends that healthcare institutions develop comprehensive green talent development frameworks with clearly defined sustainability competencies, implement formal mentoring programs pairing experienced sustainability leaders with emerging talent, enhance support for green certifications and qualifications, and create platforms for sharing best practices across departments. Policy makers should establish national certification standards for environmental competencies in healthcare, integrate sustainability into healthcare education curricula, and develop incentive mechanisms for hospitals implementing effective green talent programs. Future research should examine the long-term impacts of green talent development on patient outcomes and investigate technological integration in sustainability training programs.

Integration of Information Technology and Machine Learning for Pandemic Surveillance and Resource Maximization

Sirengo John Luca
Department of Mathematics, Applied Statistics
Kibabii University, Kenya
jsirengo@kibu.ac.ke

Abstract

This study focusses on integrating information technology and machine learning procedures for pandemic surveillance and healthcare resource maximization. This study explores the application of mathematical estimation models utilizing the Maximum Likelihood Estimation (MLE) method within machine learning frameworks to enhance early warning detection, optimize resource allocation, and improve coordination during public health emergencies. By leveraging MLE's statistical rigor for parameter estimation, the research demonstrates how predictive models can more accurately identify emerging risks, forecast resource demands, and facilitate efficient multi-agent collaboration. The results from the developed procedure will be compared to traditional approaches. The frameworks adaptability across different healthcare infrastructures will be discussed for future pandemic and disaster preparedness efforts.

Keywords: *Pandemic surveillance, healthcare resource maximization, public health emergency preparedness*

Integration of Information and Communication Technology in Agriculture Curriculum Implementation in Secondary Schools in Kimilili Sub County, Kenya

Gitau Gershon Kimani

Abstract

In recent times, considerable investment in Information and Communication Technologies (ICT) integration has been made by many countries with a belief that it will transform teaching and learning in the education system. ICT Integration is an umbrella term for any learning that takes place electronically in digital learning platforms. Classes, teaching materials, support, and assessments are all delivered using ICT facilities. The COVID 19 pandemic caused the government of Kenya to gradually shut down education institutions. Students and teachers had to embrace ICT mediated instruction. The purpose of this study was to analyse the extent of Integration of ICT in Agriculture curriculum implementation in Secondary Schools in Kimilili Sub-County. The main focus of this study was to analyse the Integration of ICT in Agriculture Curriculum Implementation in Secondary schools in Kimilili sub county, Kenya. The study objectives were to determine the extent of ICT Integration, to evaluate the stakeholders' perception on integration of ICT, to examine the main challenges faced in integrating ICT in Agriculture curriculum implementation and the effect on students' performance. The study was guided by the E-learning Theory and Bruner's Constructivism Theory. The study adopted a descriptive survey design to monitor and track how ICT integration in Agriculture curriculum implementation was done. The correlational design was used to investigate relationship between ICT integration and Students academic performance in Agriculture subject. Systematic sampling method was used to select 22 schools out of the targeted 25 schools while purposive sampling was used to select 30 teachers out of 90 targeted teachers in the selected schools. Data collection instruments included questionnaires for both teachers and learners, interview schedules for teachers and Principals. The observation checklist was used by the researcher to collect data on the extent of integration of ICT in Agriculture Curriculum implementation. Content validity was determined by piloting in four schools that were not part of the study schools. Reliability established that all the entire research instruments were considered to be reliable for use in collection of data. Measure of central tendency analysis was used to describe the extent and availability of ICT resources. Data on stakeholders' perception on ICT integration was analyzed using ANOVA test. The study found that mobile phones, laptops, computers and projectors were uniformly distributed in Kimilili sub county (SD<0.6). The study found that a positive change of perception of the teachers and learners would lead to increase in integration of ICT in Agriculture Curriculum Implementation (Eta value is 0.26). The Pearson's correlation coefficient (r) value of 0.65 indicated that ICT integration in Agriculture curriculum implementation affects 65% of the variance in academic performance of Agriculture subject. The study found that the main challenge of ICT integration was inadequate ICT resources (SD: 0.563). This finding forms evidence-based information regarding Integration of ICT in Agriculture curriculum implementation which can be used in decision making towards training of Agriculture Teachers. The study recommended that the stakeholders in secondary schools embrace the use of ICT in order to achieve good academic results. Further the study recommended that school principals should ensure there was a variety of resources for integration of ICT.

The Influence of Tuition Grants on Financial Prudence of Secondary Schools in Busia County, Kenya

Consolata Auma Oyinda & Tecla Kirwa
connieoyinda@gmail.com , tkirwa@kibu.ac.ke
Department of Economics, Finance and Accounting, Kibabii University, Bungoma, Kenya

Abstract

Financial prudence is the practice of effectively, efficiently and properly utilizing and managing financial resources wisely, while focusing on long-term stability over short-term gains. It involves careful budgeting, controlled spending, and strategic saving or investing, minimizing debt and risks. Financially prudent individuals or organizations prioritize sustainability and resilience, preparing for future uncertainties with a balanced responsible approach. Globally, most governments have invested heavily in education as a means of transformation towards sustainable development. It raises people's abilities to change their visions into reality. The study was conducted to establish tuition grant on financial prudence of secondary schools in Busia County, Kenya. The study was guided by New Public Management theory. The study adopted a descriptive survey design to establish the association between the predictor variables and financial prudence. The target population comprised of 276 respondents comprising of 92 school principals, 92 accounts clerk/ accountants and 92 HODs all derived from 92 public schools in Busia County. A sample size of 276 respondents was determined using census technique. Self-administered questionnaires were issued to respondents. Pilot study was done in secondary schools in Bungoma County. The study used Cronbach – α) model to test the internal consistency with the alpha coefficient of above 0.7 being considered reliable. Analysis of data was by both descriptive and inferential statistics techniques namely mean, median and standard deviation. Multiple regression and Pearson correlation were used for inferential statistics. The study concluded that tuition grant has significant effect on Financial Prudence of secondary schools in Busia County. The study recommends increase in tuition grants to ensure that there are enough materials for good academic progress of students in the school.

Keywords: *Financial Prudence, Tuition Grants, Secondary Schools, New Public Management Theory*

Contemporary Global Ecological Change and the Shifting Cultural Construction of the Bukusu in Popular Poetry

Dennis Wabuyaka Waswa

Abstract

This paper explores the impact of contemporary global ecological change on the shifting cultural construction of the Bukusu people by analyzing Sokoto's popular poetry. It examines how the poetry depicts the connection between culture and the ecosystem. The objective of this paper is to analyze the transformation in Bukusu cultural identity as expressed through the performance of Sokoto's spoken word poetry. This qualitative study adopts a descriptive research design, purposively sampling the poet and approximately five poems for analysis in line with the study's aims. Using ecocriticism as its theoretical framework, the study investigates how ecological changes affect the cultural identities of the Bukusu community. It does so by examining the interrelationship between nature and Bukusu cultural practices. Through a historical lens, the research highlights how urbanization, modernity, and westernization have driven shifts in cultural construction. Findings reveal that environmental changes significantly influence the evolving Bukusu culture. As ecological disruptions increase, the community has lost vital cultural practices once rooted in nature. Sokoto's poetry responds to this loss with a nostalgic and impassioned call for environmental conservation and restoration. Examples of lost cultural practices due to ecological change include traditional activities like hunting and gathering. In conclusion, Sokoto's popular poetry offers profound insight into the cultural transformation of the Bukusu people in the face of ecological degradation. It encourages the use of poetry as a tool for promoting environmental awareness and preserving both nature and cultural heritage.

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What Should Change? The Raging Debate on the Implementation of the Mathematics Curriculum at Senior School in Kenya

Edwin Masibo
Department of Curriculum and Pedagogy
Kibabii University
emasibo@kibu.ac.ke
+254729555350

Abstract
Mathematics is a core subject in the school curriculum and has been considered a critical filter in learners' career progression. In Kenya over the years mathematics has been considered one of the four subjects used to compute the cluster points for learners selected into different courses at the university. Other than being one of the cluster subjects, it is used when computing the mean grade of students in the Kenya Certificate of Secondary Education examinations. It enjoys the vantage position accorded to two other compulsory subjects English and Kiswahili. Admissibility into teaching profession by the Teachers Service Commission has had considerable focus on the grades a candidate scored in mathematics. For one to be a teacher of science subjects other than mathematics, they must have scored at least a mean grade C in mathematics and a minimum of C plus in each of the two teaching subjects. On the other hand, for one to be a teacher of Arts based subject other than mathematics, they need to have scored at least a D plus in mathematics and a minimum of C plus in the two teaching subjects. The prominence given to Mathematics begs the question why? In the last few weeks of the month of April 2025, there has been a raging debate on whether mathematics should be an optional subject at Senior school come the year 2026 during the transition of grade 9 learners from the Junior school to grade 10 in Senior school. This paper addresses the curriculum changes in mathematics in Kenya dating from the colonial times to date. It will consider a critical review of literature on mathematics education from the global perspective to the local perspective. Emphasis is put on the causes for the changes and how the changes have impacted on the implementation of the mathematics curriculum and the challenges that have been encountered over the years in the implementation of the mathematics curriculum. The paper will endeavour to define mathematics, highlight why mathematics should be taught? Who should teach mathematics? What is the minimum mathematics competency for a learner's functionality in life and career? Should mathematics be optional at senior school or what should change in the implementation of the mathematics education curriculum in Kenya?

Effects of Drugs and Substance Abuse as Portrayed on Hip Hop songs on the Internet in the Fight against Drug and Substance Abuse

Stephen Muyundo Ndinyo
Kibabii University: P.O. Box 1699 -50200. Bungoma
muyundos@gmail.com: 0713589083

Ernest Sangai Mohochi
Kibabii University P.O. Box 1699 -50200. Bungoma
mohochies@kibu.ac.ke:0714692210

Joseph Juma Musungu
Kibabii University P.O. Box 1699 -50200. Bungoma
jmusungu@kibu.ac.ke: 0710839354

Abstract

Drug and substance abuse is among the main issues affecting the community with developments in mass media communication especially the internet. The objective of the paper was to analyze the effects of drug and substance abuse as portrayed in hip hop songs on the internet on the fight against drug and substance abuse. The research was guided by the Mass Effect Theory of Marshall McLuhan's in 1964. This research adopted descriptive action design. The method of research was content analysis. The data on hip-hop songs on You Tube was observed using the content analysis tool. The target sample entailed hip-hop songs and the internet. Purposive sampling was used to select hip hop songs on drug and substance abuse on YouTube. Stratified sampling was used to classify the songs into thematic songs and groups based on similar drugs. The data collected was quantitatively analyzed and presented descriptively by the use of extracts from the songs and content analysis schedules. The paper found out that hip-hop songs highlighted the effects of drug and substance abuse on the addicts, their family and society at large hence created awareness as part of the fight on drug and substance abuse in hip hop songs on the internet. This study is of importance to The Ministry of Health, other organizations concerned with drug and substance abuse, the field of language and literature study and relevant policy developers on the fight against drug and substance abuse. Finally, the study is an eye opener to other researchers to investigate other aspects of oral literature apart from songs. Musicians are also targeted to understand the effect of their music on drugs and substance abuse. There is need for other internet platforms other than YouTube to be controlled on the fight against drugs and substance abuse.

Keywords: Effects, drugs and substance abuse, hip hop songs, internet and fight

The Impact of Data-Driven Decision-Making through the Kenya Health Information System (KHIS) on Universal Health Coverage (UHC) Implementation in Kenya

Emmanuel Waleo Bwemba
Pioneer International University
P.O. BOX 33421, Nairobi, Kenya
emmanuel.bwemba@students.piu.ac.ke
Patience Wangui
Pioneer International University
P.O. BOX 33421, Nairobi, Kenya
patience.gichuhi@students.piu.ac.ke
Wilfred Odoyo
Pioneer International University
P.O. BOX 33421, Nairobi, Kenya
wilfred.odoyo@piu.ac.ke

Abstract

Despite investments in digital health infrastructure, Kenya's devolved health system struggles to translate KHIS insights into equitable resource allocation, with only 35% of critical health indicators consistently informing budgetary decisions. The research addresses three fundamental questions: (1) How effectively does KHIS data inform health resource allocation? (2) What institutional barriers prevent data translation into policy? (3) Which interventions could strengthen this linkage? This study used mixed-methods research to analyse the disconnect through longitudinal KHIS data (2018-2023), policy documentation review, and interviews with health policymakers, revealing that with high adoption, counties including Nairobi, Makueni, and Machakos demonstrated 28% faster emergency response times (p<0.01) and 15% greater maternal health service coverage, systemic barriers including misaligned fiscal cycles (68% of counties), lack of standardised data interpretation protocols (81%), and political interference (43%) constrain KHIS's potential impact. The findings reveal an apparent efficiency paradox: although facilities in data-engaged counties reduced medicine stockout durations by 18 days (95% CI: 12-24), rural regions remain 3.2 times more likely to experience policy disconnects (OR: 3.2, 95% CI: 2.1-4.9), exacerbating health inequities. To obtain the statistical results, descriptive and inferential statistics was performed using SPSS. The study had a response rate of 82% involving only seven key informants. The study acknowledged different limitations, including self-reporting bias in interviews, limited data granularity across counties, or challenges in cross-country policy comparisons The study proposes an institutional innovation framework comprising three actionable solutions: mandatory response mechanisms for priority alerts, establishment of county Health Data Translation Units staffed by trained policy analysts, and integrated training modules for executives on evidence-based decision-making. These evidence-based recommendations effectively tackle Kenya's UHC implementation challenges and provide transferable insights on optimising data use to inform new policies in the country.

Keywords: *Governance, Data-driven decision making, Policy, Innovation, Health data translation unit, Fiscal cycles*

Dhima ya Futuhitandao katika Kukabiliana na Masuala ya Afya ya Akili Miongoni mwa Wakenya

Magambo Emilly Angushi
Chuo Kikuu cha Kibabii: P.O. Box 1699-50200. Bungoma
emilymagambo77@gmail.com – 0722696370

Simiyu Fred Wanjala
Chuo Kikuu cha Kibabii: P.O. Box 1699 -50200. BUNGOMA
wsimiyu@kibu.ac.ke – 0726335079

Orina Felix Ayioka
Chuo Kikuu cha Kibabii: P.O. Box 1699-50200. Bungoma
orinafe@kibu.ac.ke – 0727028331

Ikisiri

Fasihi kupitia utambuzi na tanzu zake tofauti tofauti, tangu jadi, imekuwa na majukumu mahususi ya kutekeleza katika jamii. Kama utanzu mojawapo wa fasihi simulizi, futuhi imetumika pakubwa katika vyombo vya habari kama vile televisheni na redioni kuwafurahisha na kuwachekesha watazamaji na wasikilizaji. Hata hivyo katika siku za hivi karibuni, futuhi imechukua mkondo tofauti katika uwasilishaji wake. Hii ni kwa sababu ya njia mpya ya mawasiliano ya teknolojia ya kisasa ambayo imezua mitandao ya kijamii kama vile *Facebook, Tik Tok, Twitter, Instagram* na *You Tube*. Mbinu mpya za kiteknolojia sasa zipo kwa wingi kuliko wakati mwingine wowote. Licha ya mkurupuko wa mbinu hizi, isisahaulike kwamba tangu jadi futuhi imekuwa muhimu katika jamii mbalimbali. Lakini sasa futuhi imekuwa karibu zaidi kwa sababu ya teknolojia ya kisasa. Vile vile suala la afya ya akili limekuwa nyeti miongoni mwa Wakenya. Hivyo basi kukawa na haja ya kuchunguza zaidi kuhusu futuhi katika mitandao hii ya kijamii na afya ya akili miongoni mwa Wakenya. Mada hii vile vile ilichaguliwa kwa sababu tafiti ambazo zilihusu futuhi, ziliegemea futuhi katika vitabu vya riwaya na tamthilia na hazikujikita katika suala la afya ya akili. Hivyo basi, kazi hii ilinuia kujaza pengo hili kwa kutafitia futuhitandao na afya ya akili miongoni mwa Wakenya na hasa kwa kuzingatia futuhi zinazopatikana kwenye mitandao ya kijamii hasa *Facebook, Twitter* na *You Tube*. Utafiti huu ulitumia muundo wa kiethnografia mkabala wa kithamano. Tulifanya uchunguzi wetu katika mitandao ya kijamii ifuatayo: *Facebook, Twitter* na *YouTube*. Data kuhusu futuhitandao imekusanywa kwa njia ya uchanganuzi wa yaliyomo. Tulitumia *Google* kama kifaa cha kukusanya data. Uteuzi wa sampuli ulikuwa wa kimakusudi na kinasibu. Umuhimu wa utafiti huu ni kuwa matokeo yake yatasaidia ufundishaji wa futuhi katika fasihi kwa kuzingatia teknolojia mpya, Wizara ya Afya itanufaika na utafiti huu hasa katika kukabiliana na suala la afya ya akili miongoni mwa Wakenya.

Istilahi Muhimu: Futuhitandao, dhima, afya ya akili, kukabiliana na futuhi

Historical Discourse of the "Ungoverned Space": An Afrocentric Framework for Countering Banditry along the Borderline of Northern Kenya

Precious Joan Wapukha[1] & Prof. John Oluoch[2]
1-Lecturer Kibabii University
2-KUCCPS

Abstract

The historical discourse of the ungoverned areas is amorphous, and the inter-sectionality in the trajectory and the unfolding of events calls for a deeper analysis concerning the banditry and conflict that have been in existence for decades. However, the area has not only experienced an avalanche of banditry activities and conflict but also harsh climatic and environmental conditions, and the unfortunate part is that the areas continue to experience discrimination by the state in terms of allocation of resources. Instead, the government relies more on international organizations for help and donor aid, which is being controlled by cartels whose focus is self-aggrandizement and partially benefits society. The state-centric approach to conflict intervention strategies and the modus operandi for countering banditry are the Eurocentric model and hard diplomacy, and it is explicit that these approaches have not worked because of the variability of the geographical region and the culture. The study will be guided by cultural sovereignty that emphasizes the right of communities to govern themselves as guided by their tradition and knowledge systems. This study will employ textual analysis methodology. The results indicated that the communities have utilized indigenous governance systems such as council elders however there has been disruption by epoch of colonialism and state-imposed systems. Banditry in Northern Kenya has escalated due to factors resource competition, proliferation of small arms and Light weapons ethnic rivalries and political. The study further noted that utilization of traditional forms of mediation, communal security structures, and empowerment of local leaders to facilitate peace-building was effective. Therefore the study concluded that addressing banditry in northern Kenya requires a holistic understanding that incorporates Afrocentric framework, and historical factors while complementing them with state-supported security structures.

Keywords: Banditry, traditional governance, Afrocentric, state-centric

Kibabii University
P.O. Box 1699 – 50200
www.kibu.ac.ke
For further information, contact:
conference25@kibu.acke
steveogallo@kibu.ac.ke

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