



**MACHAKOS
UNIVERSITY**

**4TH ANNUAL INTERNATIONAL
CONFERENCE**

DATES:
28TH - 30TH JUNE 2022

PROGRAMME & BOOK OF ABSTRACTS

THEME:

*Promoting sustainable development through
disruptive research and innovation*

Supported by;



Soaring Heights in Transforming Industry and Economy

ISO 9001:2015 CERTIFIED

MACHAKOS UNIVERSITY PRESS



MACHAKOS UNIVERSITY

4TH ANNUAL INTERNATIONAL CONFERENCE PROGRAMME

DATE

28TH – 30TH JUNE 2022

VENUE

MACHAKOS UNIVERSITY VIRTUAL PLATFORM

THEME

***PROMOTING SUSTAINABLE DEVELOPMENT THROUGH
DISRUPTIVE RESEARCH AND INNOVATION***

FUNDAMENTAL STATEMENTS

Our Vision

A Preferred University of Excellence in Scholarship and Service Delivery.

Our Mission

Provide Scholarly Education through Training, Research and Innovation for Industrial and Socio-economic Transformation of our Communities.

Our Identity

Machakos University is an Academic Institution Committed in Transmitting Knowledge, Skills and Attitude through Science, Technology and Innovation for the Benefit of Humanity.

Our Philosophy

The Philosophy of Machakos University is to Provide Transformative Leadership in Teaching, Training, Research, Innovation, Industrial and Technology Transfer for Wealth Creation.

Core Values

Integrity
Accountability
Professionalism
Inclusivity
Creativity
Teamwork
Equity

CONFERENCE COMMITTEE

1. Prof. Mugendi M'Rithaa - Chairman
2. Prof. Stanley Makindi - Secretary
3. Prof. Jones Agwata - Alternate Secretary
4. Prof. Charles Ombuki
5. Prof. Geoffrey Maroko
6. Prof. Richard Kimiti
7. Dr. Alex Kamwaria
8. Dr. Pamela Muriungi
9. Dr. Alice Nzioka
10. Dr. Julius Nzeve
11. Dr. Anashia Ong'onda
12. Dr. Benjamin Kikwai
13. Mr. Adam Shisia
14. Mr. Watson Kanuku
15. Mr. Daniel Mulinge
16. Ms. Elizabeth Mbatha

MESSAGE FROM THE VICE CHANCELLOR



I take this opportunity to once again welcome you to our Machakos University 4th Annual International Conference of 2022. One of our mandate as a University is to do research but also to disseminate that knowledge for the sake of solving societal problems and achieving socio-economic transformation of our communities. This conference is coming at a time when the world is still dealing with the effects of Covid-19 Pandemic. Globally, decision makers and scientists are on the run to ensure the socio-economic and technological development goals are sustained.

This 4th Annual International Conference, under the theme: *“Promoting Sustainable Development through Disruptive Research and Innovation”* is appropriately focused and interprets to all of us that indeed we need disruptive technologies to move forward to be at par with the rest of the world. As a result of this view and perspective, these conference’s research presentations have well been chosen and are aligned to give innovation and technology-based solutions. They are meant to respond to disruptive nature of the times we have found ourselves in. This 4th Annual International Conference takes exception to the fact that we have a duty to Kenya and to the world a whole to offer knowledge and solutions to issues and problems affecting humanity.

It is my hope that researchers and scholars from various Universities, industries and other organizations participating in this conference will offers us opportunity to share ideas and experiences to solve not only our Kenyan problems but globally as well. Am happy to note that sub-themes for this conference have captured important earmarks of concern. They interrogate critical societal issues that address agriculture, food security, economic issues, education, climatechange, socialdisruptions as well as innovations and technology.

Finally, I wish to thank our Keynote Speakers, Guest Speakers, Chief Guests, and all participants for finding time to be with us during this conference. I welcome you all to interact freely and build collaborations that will be of beneficial to all of us around the world.

Thank you and God bless you

Prof. Lucy W. Irungu, Ph.D.
VICE-CHANCELLOR & PROFESSOR OF ENTOMOLOGY

**MESSAGE FROM THE DEPUTY VICE CHANCELLOR
(RESEARCH, INNOVATION AND LINKAGES)**



Universities play a key role in unravelling new knowledge, innovation, inventions and technologies that when transferred to our communities become a panacea to improved livelihoods in this era of emerging challenges to sustainable development. The focus of our 4th Annual International Conference was conceived to drive the theme: “Promoting Sustainable Development through Disruptive Research and Innovation” as elaborated in the following sub-themes:

- 1. Climate Change, Environment, Food security, Health, Natural Resources and Tourism for Sustainable Development;*
- 2. Innovative Research on Artificial Intelligence, Big Data, Blockchain Technology and Machine Learning for Sustainable Development;*
- 3. Mathematics, Statistics and Data Science for Sustainable Development;*
- 4. Engineering Issues in Education in the Era of Disruptiveness; and*
- 5. Implications of Innovative Research and Innovation on Culture and Language Education in a Disruptive World.*

In recognition of all the participants and invited guests, please do accept my heartfelt appreciations for finding time to research, write papers and presentations around our Conference theme. Your participation is indeed a confirmation of your commitment towards making the world a better place to live. As it has become our tradition, one of the key post-conference activities will be to have papers presented during this Conference, peer reviewed and published in our Machakos University Journal of Science and Technology, besides being published in the Book of Conference Proceedings.

Lastly, I thank all our sponsors: Machakos University management and Sidian Bank for their generous support. I also thank the Conference Committee members for working around the clock during the preparatory stage. Together we have made this 4th Annual International Conference a success. I wish you all a happy and exciting conference.

Thank you.

Prof. Peter N. Mwita, Ph.D.
DEPUTY VICE-CHANCELLOR (RESAECHE, INNOVATION AND LINKAGES)

MESSAGE FROM THE CHAIRMAN, CONFERENCE COMMITTEE



The COVID-19 pandemic is arguably one of the most significant disrupters to life as we know it in recent times. Subsequently, diverse institutions have had to retool themselves to better align with emerging challenges and opportunities. To this end, the catalytic role of universities in leading context-responsive strategies for knowledge co-production is imperative.

This reality is captured in the theme of our 4th Annual International Conference: *“PROMOTING SUSTAINABLE DEVELOPMENT THROUGH DISRUPTIVE RESEARCH AND INNOVATION”*. As a consequence of the COVID-19 pandemic and allied health protocols, this Conference is taking place virtually and has attracted participation from various regions internationally. We thank the community of scholars and researchers who have supported our Conference and made it a robust a dynamic platform for the exchange of novel ideas that will ultimately impact positively on society at large. I also encourage you to visit our institutional website to access copies of books of conference proceedings, as well as published journal articles from previous conferences.

Lastly, I thank our sponsors and partners; notably Machakos University and Sidian Bank. It would be remiss of me not to acknowledge my fellow Conference Committee members whose commitment, direction and service has aided in advancing our collective goals and aspirations. Together we have made this 4th Annual International Conference a success – and buoyed our expectations for the 5th edition.

I wish you all a productive and engaging conference.

Thank you.

Prof. Mugendi K. M'RITHAA
DEAN: SCHOOL OF HUMANITIES AND SOCIAL SCIENCES
CHAIRMAN: CONFERENCE COMMITTEE

MEMBERS OF THE UNIVERSITY BOARD OF MANAGEMENT



Prof. Lucy Irungu, Ph.D.
Vice Chancellor



Prof. Peter Mwita
Deputy Vice Chancellor (Research,
Innovation & Linkages)



Prof. Joyce Agalo
Deputy Vice-Chancellor
(Academics & Student Affairs)



Prof. Fredrick Ogola
Ag. Deputy Vice Chancellor
(Administration, Planning & Finance)



Prof. Stanley Makindi
Ag. Registrar (Research,
Innovation & Linkages)



Prof. Ezra Ondari-Okemwa,
Registrar (Academics & Student
Affairs)



Dr. Susan Nzioki, Registrar
(Administration, Planning & Finance)



CPA Terry Mutunga
Ag. Chief Finance Officer



Advocate Mumbi Mwhurih
Head of Legal Affairs & Council Secretariat

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CHIEF GUEST – OFFICIAL OPENING

PROF. WALTER O. OYAWA

*Director General
National Commission for Science, Technology and Innovation*



Prof. Walter Oyawa is a Professor of Civil Engineering, and currently the Director General, National Commission for Science, Technology and Innovation (NACOSTI). He is a holder of a PhD in Civil Engineering, and a holder of Executive MBA. He is a Registered Professional Engineer, a Lead EIA Expert with NEMA and a reviewer of several international journals. In addition to his current position as Director General of NACOSTI, Prof. Oyawa has served in various senior leadership/management positions including having been the Principal/CEO of Multimedia University College, Deputy Commission Secretary at the Commission for University Education (CUE), pioneering Ag. Principal of the College of Engineering & Technology at Jomo Kenyatta University of Agriculture and Technology (JKUAT), Director of a Research Centre-SMARTEC at JKUAT, Chairman of the Department of Civil Engineering at JKUAT, Board member of several boards, among others. He is endowed with vast experience in

research/scholarly work, as evidenced by extensive publications in peer reviewed journals, several awards and research grants, keynote lectures and conference papers, and supervision of numerous postgraduate students. His research interest is in the area of sustainable construction materials and technologies.

CHIEF GUEST – OFFICIAL CLOSING

MR. PATRICK ABELLE
(CHAIRMAN OF COUNCIL, MACHAKOS UNIVERSITY)

GUEST SPEAKER

DR. SOLOMON NWABUEZE AGBO



Dr. Solomon Nwabueze Agbo was born at Nsukka town in Enugu State of Nigeria. He obtained his bachelors and masters degrees in Physics in 1999 and 2005 respectively from the University of Nigeria, Nsukka. In 2007 he was awarded Dutch government PhD scholarship thus he proceeded to Delft University of Technology, Delft Netherlands where he did his PhD in materials physics/sustainable energy and obtained his PhD degree in 2012. For his PhD work, Dr. Agbo investigated the growth evolution of thin-film nanocrystalline silicon materials implemented in the development of thin film silicon solar cells. Upon return to Nigeria after his PhD, he headed the Photovoltaic department of the National Centre for Energy Research and Development, University of Nigeria, Nsukka before joining the University of West Bohemia, Pilsen, Czech Republic as a postdoctoral fellow in 2013. For one and half years in Czech Republic he worked on developing silicon quantum dots and superlattices as efficiency-enhancers in multijunction solar cells, a project jointly funded by the EU and the Czech government.

Dr. Agbo was awarded postdoctoral research fellowship by the Alexander von Humboldt foundation, thus from January 2015 till December 2017 he was a Humboldt fellow working at the Institute of Energy and Climate Research, Forschungszentrum, Jülich Germany. He remains till date a senior research scientist and project manager in the same research centre where he is responsible for coordinating all the research activities and collaborations between Forschungszentrum Jülich and African institutions. Dr Agbo has initiated several multi-million Euro research projects. He is the coordinator and principal investigator of the ongoing H2Atlas-Africa project involving Forschungszentrum Jülich and 35 African countries. He initiated and coordinates the YESPVNIGBEN project, with research centre Jülich, University of Nigeria, Nsukka, Centre for Atmospheric research (CAS, NARSDA) Anyigba and University of Abomei Calavi, Benin Republic as partners. Within the framework of this project, five UNN staff (young academics) are currently in Jülich for both PhD and Master's program.

In the last 20 years, Dr. Agbo has been working in the field of renewable energy as a scientist, academic, consultant and project manager across institutions in Europe and Africa. He is a reviewer for several international journals, postgraduate external examiner for University of Fort Hare, South Africa. He was a lead consultant in the GIZ Energy Support Program for Nigeria and has held visiting professorship position in UNN. Dr. Agbo has published widely with over 40 publications in reputable journals in the fields of solar water heating, solar radiation modeling, thin-film depositions and applications, integrated energy harvesting-storage devices, green hydrogen and photovoltaic systems analyses. He is a

member of the International Solar Energy Society, European Material Research Society, Solar Energy Society of Nigeria, Nigeria Institute of Physics, Materials Research Society and International Institute for Electronics and Electrical Engineers (IEEE)

KEY NOTE SPEAKERS

PROF. WILKISTER NYAORA MOTURI



Prof. Wilkister Nyaora Moturi holds a Ph.D in Environmental Science (Health) from Egerton University. She is currently a professor (Environmental Health) at the same institution. She is currently serving as the Dean, Faculty of Environment and Resources Development. She has won many awards which have facilitated her personal development in her area of specialization. She has held consultancies with various organisations and participated in many research projects either as a principal investigator or as a co-investigator. She has published widely in her area of expertise and presented several papers in international conferences.

PROF. JOHN KIHORO



Prof. John Kihoro holds a Ph.D. (Statistics), Jomo Kenyatta University of Agriculture and Technology. He is a professor of Applied Statistics at the School of Computing and Mathematics at The Co-operative University of Kenya. He also serves as Dean, School of Computing and Mathematics-CUK. He has memberships

with the Kenya National Statistical Society (KNBS); the International Biometric Society-Group Kenya (IBS-GKe) and the Kenya Society of Professional Co-operators. He has held consultancies and published widely in his areas of expertise. He has also served in various institutions of higher learning as an external examiner.

PROF. ALEX MUMBO



Prof. Alex Mumbo holds a Doctorate in Materials Engineering from Nagoya University (Japan), MSc in Advanced Manufacturing Systems Engineering and Management from the University of Bradford (UK) and B. TECH (Hons.) in Production Technology from Moi University (Eldoret – Kenya). He has over 33 years of teaching and research experience particularly in Energy, Materials engineering/science, Design, Additive/Subtractive manufacturing and Foundry engineering. He is a mechanical engineer by profession and a mentor with the Engineers Board of Kenya (EBK). He has actively participated in organizing IEK-sponsored functions and events including the Annual IEK-EBK International Conference. He has participated in initiatives that promote collaboration between Academia and Industry, particularly towards realization of the fourth industrial revolution and a green future, and has trained industry professionals on; Continuous improvement, Failure mode and effect analysis, Lean manufacturing/administration, Change management and Total quality management among other short courses.

PROF. ANGELINA KIOKO



Prof. Angelina Nduku Kioko is a Professor of English and Linguistics at the United States International University – Africa (USIU-A). She has engaged in higher education institutions for 34 years in: teaching and examining both undergraduate, graduate and postgraduate programs; supervising and examining graduate research at Master’s and Doctorate levels; serving as external examiner to a wide range of universities locally, regionally and internationally; developing and evaluating curriculum within and beyond the institution; spearheading the establishment of quality enhancement and quality assurance systems within the institution; and responding to external accrediting commissions on issues of institutional audits and quality assurance requirements. Fourteen of these years were spent at Kenyatta University- Kenya where the majority of the undergraduate students then were training as graduate secondary school teachers, and the remaining 20 years have been spent at United States International University- Africa. During this period, Professor Kioko has also excelled in scholarship in the area of research and publication. To date her publications include: 42 publications in the books and book chapters category; 16 publications in refereed journals; and 54 conference papers, 10 of which are in the area of quality assurance in higher education.

Professor Kioko’s service to the profession and the community at large has been marked by but not limited to: long term service as an expert in national English language panels with the Kenya National Examination Council and the Kenya Institute of Curriculum Development; involvement in teacher development program with the Ministry of Education Science and Technology and also with other organisations like the British Council; service to the Commission for University Education as a resource person for reviewing programs and institutions for accreditation; engagement with the WASC Senior College and University Commission, engagement in the development of the national language policy; and consultancy work in the development of early grade literacy material at national and international scale.

CONFERENCE PROGRAMME

OFFICIAL OPENING AND KEY NOTE ADDRESS

TIME	DAY ONE: 28TH JUNE 2022	RESPONSIBILITY
8.00 – 9.00	Log-in and Registration	Secretariat and Committee Members
9.00 – 10.30	OFFICIAL OPENING CEREMONY	
	Opening Prayer	Dr. Julius Nzeve
	Welcoming Remarks by Prof. Peter Mwita, Deputy Vice-Chancellor (Research, Innovation and Linkages, Machakos University) who invites the Vice-Chancellor, Machakos University	Prof. Stanley Makindi
	Opening Address by Prof. Lucy Irungu, Vice-Chancellor, Machakos University	Prof. Peter Mwita, Deputy Vice Chancellor (RIL)
	The Vice-Chancellor invites the Chief Guest to address and officially open the 4 th Machakos University Annual Conference.	Prof. Lucy Irungu, Vice-Chancellor
	OFFICIAL OPENING ADDRESS	Prof. Lucy Irungu, Vice-Chancellor
10.30 – 11.00	PHOTO SESSION & HEALTH BREAK	Dan Mulinge/Secretariat
11.30 – 12.30	Address by Chief Guest: Dr. Dr. Solomon Nwabueze Agbo	Prof. Mugendi M'Rithaa
12.30-1.00	PLENARY DISCUSSION	Prof. Jones Agwata

DAY 1: TUESDAY 28TH JUNE 2022
VENUE: SUB-THEME VIRTUAL PLATFORM

SESSION CHAIR: Dr. Alex Kamwaria. **RAPPORTEUR:** Dr. Anashia Ong'onda

SUB-THEME 5 - IMPLICATIONS OF INNOVATIVE RESEARCH AND INNOVATION CULTURE AND LANGUAGE EDUCATION IN A DISRUPTIVE WORLD

GUEST SPEAKER: Prof. Angelina Nduku Kioko

TIME	PRESENTATION
2.00 – 2.40	Prof. Angelina Nduku Kioko – Guest Speaker's presentation
2.40 – 3.00	Mugendi K. M'Rithaa: <i>Design Thinking in the Age of Disruption: The Afrikan context.</i>
3.00 – 3.20	Romano Okwi Elingit: <i>Talent Management and Institutional Performance</i>
3.20 – 3.40	Onyango Daniel Oduor, Justine Matiko Alloph, Veneranda Paulo: <i>Influence of cultural Activities on Primary Education in Tanzania</i>
3.40 – 4.00	Kimiti Richard Peter: <i>The Transition from 8-4-4 to 2-6-6-3 (Competence Based Curriculum) system of education in Kenya: A Case of Public and Private Universities</i>
4.00 – 4.20	Geoffrey Maroko, Gladys Mokua & Augustus Nyakundi: <i>Empowerment of Self-Help Groups of People Living with HIV/AIDS in Kisii County: Lessons from Research and Practice</i>
4.20 – 4.40	Mbuthi. M. Peter: <i>Religion and Sustainable Development: Exploring the Role of the Church in Environmental Conservation in Makeni County.</i>

DAY 2: WEDNESDAY 29TH JUNE 2022
VENUE: SUB-THEME VIRTUAL PLATFORM

SESSION CHAIR: Prof. Charles Ombuki. **RAPPORTEUR:** Dr. Alice Nzioka

SUB-THEME 1: CLIMATE CHANGE, ENVIRONMENT, FOOD SECURITY, HEALTH, NATURAL RESOURCES AND TOURISM FOR SUSTAINABLE DEVELOPMENT

GUEST SPEAKER: Prof. Wilkister Nyaora Moturi

TIME	PRESENTATION
8.20 – 9.00	Prof. Wilkister Nyaora Moturi – Guest Speaker's presentation
9.00 – 9.20	Titus M. Kasimu, Harun M. Mbuvi, Francis M. Maingi: <i>Superabsorbent Synthesized from Lemon Juice/Ethylenediamine Based Hydrogel Cross-Linked with Maleic Acid for Sustainable Agriculture</i>
9.20 – 9.40	Z. M. Getenga; A. N. Ngige; S.J. Kimosop; G. K. Mutua; F. Kengara; S. Reiner; D. Ulrike: <i>Evidence of Enhanced Degradation of Pesticides in Agricultural Soils</i>
9.40- 10.00	Mwangi Ruth, Michael Munene, Samuel Maina: <i>Natural Resources Use and Tourism for Sustainable Development in Laikipia District</i>

10.00 – 10.20	Mugambi Pamela Makena, Muturi Willy, Njeru Agnes: <i>Capital Structure Mediating Effect on Financial Performance of Star Rated Hotels in Nairobi County</i>
10.20 – 10.40	Charles Ombuki: <i>An Appropriate Credit Scheme to enhance Food Security in Kenya: Lessons from West Africa</i>
11.00 – 11.20	HEALTH BREAK
11.20 – 11.40	Jones F. Agwata & Angelyne M. Mwabu: <i>Implications of Green Marketing on Environmental Management in Machakos County, Kenya</i>
11.40 – 12.00	Reinhard Endeki, Stanley M. Makindi, & Shadrack K. Inoti: <i>Impacts of Agroforestry Technologies on Livelihood Improvement in Vihiga County, Kenya</i>
12.00 – 12.20	Nzioka, Alice Mueni, Juliet Magoma Mesa, & Jane Jebet Bitok: <i>A Critical Examination of the Effectiveness of Exhibition Events in Promoting the Tourism Industry in Kenya: A Case of Nairobi CBD</i>
12.20 – 12.40	Sabina Emilly Dimba & Julius Nzeve: <i>Assessment of heavy metal concentrations in Nile tilapia (<i>Oreochromis niloticus</i>) from an urban stream in Machakos town, Kenya</i>
12.40-1.00	Stephen Aurice Wekoye, Wilkister Nyaora Moturi, & Stanley Makindi: <i>Adoption of Occupational Safety and Health Measures in the Informal Manufacturing Sector in Kampala, Uganda</i>
1.00 – 2.00	HEALTH BREAK
2.00 – 2.20	Jones F. Agwata: <i>Policy and Institutional Mechanisms for Drought Management in Kenya</i>
2.20 – 2.40	Mercy Mulyungi & Julius Nzeve: <i>Assessment of toxic heavy metals in sewage sludge from Decentralized Treatment Facility in Machakos town, Kenya</i>
2.40 – 3.00	Petronilla Adhiambo & Julius Nzeve: <i>Assessment of water quality from Manza River in Machakos town, Kenya</i>
3.00 - 3.20	Stanley M. Makindi and Wedgener Sindani Mungatsiai: <i>Policy Framework on the Conservation and Management of Riparian Lands in Kenya</i>
3.20 – 3.40	Petronila Adhiambo & Julius Nzeve: <i>Assessment of water quality from Manza River in Machakos town, Kenya</i>

DAY 2: WEDNESDAY 29TH JUNE 2022

VENUE: SUB-THEME VIRTUAL PLATFORM

SESSION CHAIR: Dr. Patricia Muendo. RAPPORTEUR: Dr. Joel Ngesa

SUB-THEME 2 – INNOVATIVE RESEARCH ON ARTIFICIAL INTELLIGENCE, BIG DATA, BLOCKCHAIN TECHNOLOGY AND MACHINE LEARNING FOR SUSTAINABLE DEVELOPMENT; AND

SUB-THEME 3: MATHEMATICS, STATISTICS AND DATA SCIENCE FOR SUSTAINABLE DEVELOPMENT

GUEST SPEAKER: Prof. John Kihoro

TIME	PRESENTATION
8.20 – 9.00	Prof. John Kihoro – Guest Speaker’s presentation
9.00 – 9.20	Sammy Maingi: <i>Mathematical modelling of inclined magnetic -field effect on bio-convection flow of magneto-cross nano-fluids</i>
9.20 – 9.40	Mary M. Mulungye: <i>Effects of Mastery Learning Strategy on Mathematical Competence among Secondary School Students in Kenya</i>
9.40 – 10.00	Lucas Khaoya Mukwabi: <i>Numerical Modelling and Simulation of Carbon-Based Nanofluid in Augmenting Thermal Conductivity in a Parabolic Solar Collector</i>
10.00 – 10.20	Nyundo Stephen Kaingu, Mutuku Winifred Nduku and Ngesa Joel: <i>Analysis of Arrhenius Activation Energy in an Electrically Conducting Fluid Flow with Chemical Reaction and Viscous Dissipation</i>
10.20 – 10.40	Koech Vincent: <i>Application of Expansive Mapping on Fixed Point Theorem in Metric Spaces</i>
10.40 – 11.00	Charles Otieno Ndede: <i>Unsteady Hydromagnetic Flow of Hybrid Nanofluid in Aparabolic Thermal Solar Collector</i>
11.00 – 11.20	HEALTH BREAK
11.20 – 11.40	Musyoki Watson Kanuku & John Ndia: <i>Fog-To-Cloud continuum fault tolerance: A systematic review</i>
11.40 – 12.00	Daniel Mulinge, Watson Kanuku, John Kandiri & Bernard Maake: <i>Conversational Artificial Intelligence for Higher Education Support</i>
12.00 – 12.20	Stephen N. Mailu: <i>Pollutants in Wastewater: A Novel way of their Determination</i>
12.20 - 12.40	Alpha Nunda: <i>Effect of FinTech on Share Price and Profitability of Listed Commercial Banks in Kenya, Uganda and Tanzania-</i>
12.40 – 1.00	Jemimah Muchai, David Mulwa, & Wycliffe Amukowa <i>Effects of Resource Allocation as Per ISO9001:2015 Quality Management System Requirements on Post-Examination Services Delivery in Public Universities in Kenya</i>
1.00 – 2.00	HEALTH BREAK
2.00 – 2.20	Emise Kageni Miriti Nancy K. Mbaka, & Humphrey K. Ireri: <i>Analysis of Conceptual Metaphors in Gichuka Social Discourse: An Ontological Perspective</i>
2.20 – 2.40	Rhoda M. King’ali: <i>Effects of Magnetic Induction, Hall Current and Thermal Diffusion on Mhd Flow of a Nanofluid Past Semi-Infinite Vertical Plate</i>

DAY 2: WEDNESDAY 29TH JUNE 2022	
VENUE: SUB-THEME VIRTUAL PLATFORM	
SESSION CHAIR: Dr. Charles Mwaniki/ Dr Alex Kamwaria. RAPPORTEUR Dr Anashia Ong'onda/ Mr Duncan Kilungu	
<i>SUB-THEME 4 – ENGINEERING ISSUES IN EDUCATION IN THE ERA OF DISRUPTIVENESS</i>	
GUEST SPEAKER: Prof. Alex Mumbo	
TIME	PRESENTATION
8.20 – 9.00	Prof. Alex Mumbo – Guest Speaker’s Presentation
9.00 – 9.20	Kemei Peninnah Jerop, Anthony Kerige Kamau, Bernard K. Rop, Japhet O. Ombiko: <i>Petrophysical Analysis of Gas and Oil of Anza Basin Using Techlog Software</i>
9.20 – 9.40	Abel Mukubwa: <i>Sommerfeld’s Coefficient of a Boson-Fermion Pair Condensate in High Temperature Superconductors</i>
9.40 – 10.00	Fred Wekesa Masinde & John Wanjala Makokha: <i>Sommerfeld’s Coefficient of a Boson-Fermion Pair Condensate in High Temperature Superconductors</i>
10.00 – 10.20	Joel M. Mweu*, Urbanus N. Mutwiwa, Erick K. Ronoh: <i>Evaluation of UV-Blocking Film on the Greenhouse Solar Dryer Performance and Drying Kinetics of Tomato</i>
10.20 – 10.40	Bernard Kipsang Rop, Fatuma R. Mwanganga and Leah Wangari Mbataru: <i>Opportunities for Investment in Kenya’s Mineral Sector</i>
10.40 - 11.00	HEALTH BREAK
11.00 – 11. 20	Jesca Kwalevele & Onyango Daniel Oduor: <i>Influence of Head of School Culture of Planning and Controlling In Provision of Guidance and Counselling in Secondary Schools in Bunda District in Tanzania</i>
11.20 – 11.40	Emmanuel Simon¹, *Daniel Oduor Onyango², Justine Alloph³ & Veneranda Paulo Byerengo⁴: <i>Opportunities to learn and use Information Communication Technology in Teaching and Learning by Teachers with Visual Impairment in Dar es Salaam, Tanzania</i> <i>Opportunities to learn and use Information Communication Technology in Teaching and Learning by Teachers with Visual Impairment in Dar es Salaam, Tanzania</i>
11.40 – 12.00	Joseph Hokororo Ismail: <i>Nafasi ya Makavazi ya Elimu na Utamaduni Tanzania katika kuhifadhi kazi za Taaluma za Kiswahili: Mifano kutoka Isimu ya Kiswahili</i>
12.00 – 12.20	Demetria Gerold Mkulu: <i>Research Innovation as Transformation tool for Quality Education in Selected Higher Learning Institutions in Mwanza-Tanzania</i>
12.20 – 12.40	Geoffrey Maroko: <i>Ekegusii Ecological Oral Traditions for Language Learning</i>
12.40 – 1.00	Wanyama Ogutu: <i>Re-configuring the Rights to Education through Play with Painting and Clay Modeling among children affected by psychosocial effects of COVID-19 pandemic</i>

1.00 – 2.00	HEALTH BREAK
2.00 – 2.40	Juliana Ndunge Maitha, Geoffrey Mokuu Maroko, Larry Mutinda Ndivo: <i>Language Problems in the Family Planning Interactions at Machakos Level 5 Hospital, Kenya</i>
2.40 – 3.00	Chege, Samuel Nganga: <i>Parents’ Perceptions on the Teaching of Indigenous Languages in the CBC Curriculum: A Case Study of Schools in Kiambu County, Kenya</i>
3.00 – 3.20	Michael Chepkwony Kipkurui & Larry Ndivo: <i>Speaking through Silence: A Feminist reading of Chinua Achebe’s Arrow of God and Elechi Amadi’s The Concubine</i>
3.20 – 3.40	*Veneranda Paulo Byerengo, Justine Matiko Alloph & Daniel Oduor Onyango: <i>Reflection on the Innovative Solutions for Solving English Language Educational Challenges in Secondary Schools, Tanzania</i>
3.40 – 4.00	Virginia Mwathi & Larry Ndivo: <i>Of Social Media, a "Renegade" Kenyan Tweep and Conversations on Gender, sex and Sexuality Of Social Media, a "Renegade" Kenyan Tweep and Conversations on Gender, sex and Sexuality</i> <i>Kwa mtandao wa kijamii, Mkenya “mwasi” katika Twitter na mijadala ya uana, jinsia na ngono</i> <i>Kwa mtandao wa kijamii, Mkenya “mwasi” katika Twitter na mijadala ya uana, jinsia na ngono</i>
4.00 – 4.20	Fellis Mutune, Geoffrey Maroko & Alice Kiai: <i>Construction of Gender in Visual Signs in Selected Kenyan Secondary School English Textbooks</i>
4.20 – 4.40	Godfrey Nyongesa, Doris Mbugua & Rose Boit: <i>Effect of Strategic Direction on Service Quality of Accredited Universities in Kenya</i>

CLOSING CEREMONY: VENUE: VIRTUAL PLATFORM

TIME	DAY 3:30TH JUNE 2022	RESPONSIBILITY
11.30 – 12:00	Assembling	Prof. Henry Embeywa
12.00 – 1.00	OFFICIAL CLOSING PROGRAMME	
	Conference Recap and Way Forward: Prof. Jones Agwata	
	Closing Remarks by Prof. Peter Mwita (DVC- Research, Innovation and Linkages, Machakos University)	Prof. Peter Mwita
	Closing Remarks by Prof. Lucy Irungu (Vice-Chancellor, Machakos University)	Prof. Lucy Irungu (VC)
	SPEECH AND OFFICIAL CLOSING OF THE CONFERENCE BY THE CHIEF GUEST	
1:00	PHOTO SESSION	Dan Mulinge

ABSTRACTS

SUB-THEME 1: CLIMATE CHANGE, ENVIRONMENT, FOOD SECURITY, HEALTH, NATURAL RESOURCES AND TOURISM FOR SUSTAINABLE DEVELOPMENT

Superabsorbent Synthesized from Lemon Juice/Ethylenediamine Based Hydrogel Cross-Linked with Maleic Acid for Sustainable Agriculture

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Abstract

Hydrogels are 3-dimensional polymer network materials with the ability to absorb a large amount of water. The current advancement in technology has increased their demand in industrial and environmental applications. This study reports the synthesis and characterization of green superabsorbent hydrogels derived from lemon juice. This involved linking lemon juice (LJ) with Ethylenediamine (EDA) to obtain HLE-1 polymer hydrogel. The polymer hydrogel was cross-linked with maleic acid via an ester linkage to form HLE-2 hydrogel. The hydrogels were characterized using FT-IR, SEM, and XRD. The optimization of the swelling conditions was studied by varying contact time and dosage of both lemon juice and the cross-linker. XRD analysis showed the conversion of amorphous hydrogel HLE-1 to crystalline hydrogel HLE-2. The FT-IR spectra showed a new strong symmetric stretching -COO- peak at 1079.83 cm⁻¹ in HLE-2 indicating successful ester linkage. SEM analysis showed pores of different sizes and shapes in HAE-2 compared to a rigid, concrete, and smooth surface in HLE-1. The mole ratio of LJ, EDA, and maleic acid of 3:7:1 produced hydrogel with a swelling capacity of 925%. Crosslinking the hydrogel improved its water absorption ability. The cross-linked hydrogel poses potential application in agriculture in semi and arid regions that requires water conservation.

Keywords: *Characterization, lemon juice, Cross-linking, Ethylenediamine, Green superabsorbent hydrogel*

Evidence of Enhanced Degradation of Pesticides in Agricultural Soils

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Abstract

Pesticides newly introduced into the soil are normally poorly degraded by the native microbes in the soil. However, studies have shown that repeated pesticide exposure to

the microbes in the soil may enhance their biodegradation through selective enrichment of the pesticide-metabolizing microorganisms, particularly when the compound is used as a C or N and energy source. Enhanced degradation of recalcitrant compounds in soil has a significant environmental impact as the chemicals are less likely to contaminate the environment. We have undertaken various studies to isolate these adapted microbes which rapidly degrade chemicals hitherto known to be recalcitrant in soil. The microbes have the potential for use in the bioremediation (bioaugmentation). In addition, other studies have been undertaken to remove pesticide contamination from the environment by use of organic materials locally generated as organic amendments (biostimulation). We report in this paper various methods that have been used in the course of our studies in determining the utilization of the selected chemicals (pesticides) by the adapted microbes as a source of C and N for growth and energy. We also present some of the compounds we have worked with and the successes registered in isolating key degraders of the respective pesticides and the extent the locally generated organic materials are able to enhance the degradation of the respective chemicals in soil.

Key words: *Biostimulation, bioremediation, key degrader, pesticides, soil*

Impacts of Agroforestry Technologies on Livelihood Improvement in Vihiga County, Kenya

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Abstract

The adoption of agroforestry technologies remains an important strategy to reduce poverty and hunger among resource-constrained rural farmers. However, the potential contribution of agroforestry technologies to both the economy and sustainable development goals in Vihiga County, Kenya is yet to be fully exploited. Hence the need to appraise agroforestry technologies in Vihiga County to realize maximum benefits. This study determined the impacts of agroforestry technologies on livelihoods and the various socioeconomic factors influencing the adoption of agroforestry technologies. The study sampled four major villages in Hamisi and Sabatia sub-counties; Shamakhokho, Kaimosi, Sabatia, Mago. A multi-stage sampling technique was used

for this study. A total of 110 households were interviewed for this study. Semi-structured questionnaires and observation checklist were used to collect quantitative data, while key informant interviews were also carried out to collect qualitative data. Data were analyzed using Statistical Package for the Social Sciences (SPSS) using both descriptive and inferential statistics. Significant levels were expressed at $\alpha \leq 0.05$. Chi-square test of association indicated that the socioeconomic factors influencing the adoption of agroforestry technologies were income ($\chi^2 = 20.951$; $p < 0.05$) and size of land ($\chi^2 = 23.282$; $p < 0.05$). The study showed that 85% of respondents reported over 30% monthly income increase from the sale of agroforestry products such as; firewood (57%), timber (27%), fruits (15%) and charcoal (1%). Other benefits include; provision of construction material, Medicine, food and shade. In light of the benefits realized, 57% of the respondents affirmed that they were able to meet their basic needs from agroforestry technologies. In conclusion, this study established that agroforestry technologies positively impacted the livelihoods of farmers in the study area. The study recommends strengthening extension service delivery and intensification of agroforestry production through diversification of agroforestry products and harmonizing the market structures.

Key Words: *Agroforestry, Adoption, livelihood improvement*

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Natural Resources Use and Tourism for Sustainable Development in Laikipia District

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Abstract

Natural resource use and tourism in areas where wildlife thrives is an important issue that is not only local but globally disseminated to create awareness towards good governance. Tourism is the second largest income generating revenue in Kenya through visits as tourists love to view wildlife. The communities living in Northern Kenya are nomadic and rely on land for water and fodder for their livestock. Due to increased human population and overgrazing the land is stripped bare and degradation occurs. Climatic change and human activities affect natural resources negatively and infringes on the landscape that is bare and polluted and may not support life of future generations.

Wildlife habitats are destroyed, human wildlife conflict occurs and tourism is affected in return. Laikipia District in Northern Kenya, Maa community came together to start Tasia Lodge to attract tourism based on wildlife species which in-turn necessitated the need to conserve natural resources. This increased the population of wildlife in the area, increased tourism in the area and more revenue came to the people living around Lekurruki Conservancy. Community conservation merged with natural resource management is a new approach that will look into restoration of degraded lands as stipulated in the sustainable development goals (SDGs). The researcher will use human centred approach to look into community needs and how they are met successfully. Alternative economical approaches that the community can employ so as to reduce dependence on natural resources and sustainably grow tourism in Lekurruki Conservancy.

Key words: *Natural resource management, community conservation, human centred design, land degradation, tourism, alternative livelihoods*

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Capital Structure Mediating Effect on Financial Performance of Star Rated Hotels in Nairobi County

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Abstract

Capital structure is among the most significant financial decisions in business financing strategy. It encompasses the choice of equity and debt level in financing business operations. This study aimed to observe the effect of capital structure determinants in the hotel industry and how this can influence their financial performance. The study scrutinized the capital structure determinants of hotel industry on financial performance in Nairobi, Kenya in light of five theories namely; the Modigliani and Miller (M-M) theory and Pecking- order theory. The study examined the mediating effect of capital structure on financial performance of star rated hotels in Nairobi. Specifically, the study sought to determine the effect of tangibility, firm size, earnings volatility and liquidity on financial performance of hotels. A census of the registered, licensed and classified hotels in Nairobi, Kenya retrieved from the Tourism Regulatory Authority for the period January 2011 to December 2019. This study used explanatory research design and utilized secondary panel data extracted from the financial statements of the target population, which is 40 hotels. Data was analysed quantitatively using descriptive statistics and panel regression analysis techniques with the aid of STATA 16. Results of the study indicated positive and significant effect of firm size, asset tangibility, liquidity and earnings volatility on financial performance. Further, these drivers had significant effect on capital structure that had significant mediating effect on financial performance. Thus, it was concluded that hotels in Nairobi County ought to examine their capital structure so as to optimize their financial performance.

Key words: *Capital structure, financial performance, firm size, asset tangibility, liquidity, earnings volatility.*

Adoption of Occupational Safety and Health Measures in the Informal Manufacturing Sector in Kampala, Uganda

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Abstract

Globalization has facilitated the rapid increase in informal employment and has been associated with the “generation of employment that is flexible, precarious and insecure”. Many informal jobs are not only “flexible, precarious and insecure but are also hazardous and take place in unhealthy and unsafe environments. Informal sector workers operate in inhumane conditions and makeshift places without sanitary facilities. Enforcement and compliance with safety and health standards are unknown. There are high and tragic incidences of occupational related accidents and injuries that go unabated in Kampala. The purpose of the study was to assess compliance levels of occupational safety and health (OSH) measures among informal manufacturing sector workers in Uganda. A cross sectional survey design was used, both qualitative and quantitative data were collected from three hundred and eighty eight (388) firms in the manufacture of metal products, furniture, textiles and clothing, concrete and brick, repair of machinery and other manufacturing sectors of the informal sectors. Data on hazards and practices were obtained using questionnaires and International Labour Organization (ILO) adapted workplace checklist with a response rate of 92%, OSH Conventions, Acts, textbooks and government reports were used for secondary data. Various types of hazards were identified; inadequate ventilation (50.4%), optical radiation (44%), extreme weather (37.4%), extreme heat (34.3%), extreme noise (27.9%) in manufacture of metal products. Noxious gases (26.7%) and (21.3%) were in manufacture of metal products. Ergonomic hazards, heavy lifting (19.5%) in metallic products and psychosocial hazards such as stress accounted for 30.5% in metal products. Compliance with OSH control measures was low, 60.8% did not comply with safe work practices, and 61.8% did not apply hazard controls while 86.4% lacked information on OSH, however Personal Protective Equipment (PPE) usage was 65.4%. Creation of awareness through mass media, training, provision of OSH regulations and regulation by government were recommended.

Keywords: *Adoption; Compliance, Occupational Safety Health Measures*

An Appropriate Credit Scheme to enhance Food Security in Kenya: Lessons from West Africa

Charles Ombuki, Machakos University

Abstract

Agriculture in Kenya is the backbone of the country’s economy and a source of livelihood for majority of the rural population. The sector contributes about 26 percent of the country’s GDP, employs about 75 percent of the population and is a major source of food to Kenya’s growing population. Food security has been and continues to be a major challenge to both rural and urban population in Kenya. This is because, the production of maize which is a staple crop and whose sufficient availability is equivalent to food security in the country has over the years been less than what is required for the population. For instance, with per capita maize consumption at 125kgs, Kenya experienced a maize deficit of between 1.5 million and over 2.0 million metric tonnes during the period 210 to 2015. The situation seems to worsen following the covid-19 pandemic. For instance, while maize production in Kenya was 44 million bags in 2019, these decreased to 42.1 million bags in 2020. Indeed, by November 2021, 7.9 million people lacked sufficient food for consumption. The implication here is that food security is indeed a serious challenge in Kenya and must be addressed. In Kenya, credit is mainly extended to farmers who grow cash crops. Such credit is mainly given to help enhance crop production by assisting farmers to buy the necessary farm inputs. Further, in Kenya, there seems to be no organized and effective approach of credit extension to maize growers with a view of not only enhancing maize production but also promoting food security. This study sought through desk review to propose for adoption and implementation an inventory credit system in Kenya as applied in Burkina Faso in West Africa. Through the review, the study identifies challenges contributing to food insecurity in Kenya and explores how if adopted, the inventory credit scheme will help combat food insecurity.

Key words: *Food Security, Inventory Credit*

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Implications of Green Marketing on Environmental Management in Machakos County, Kenya

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Abstract

Green marketing is a holistic management process responsible for identifying, anticipating and satisfying requirements of customers and society in a profitable and sustainable way. It consists of all activities designed to generate and facilitate exchanges intended to satisfy human needs, with minimal adverse impacts on the natural environment. Environmental management is a critical social and business issue that has continued to gain prominence as the twenty first century progresses due to the devastating effects of human activities on the Earth's ecosystems. Since economic issues cannot be separated from environmental issues, it is important to appreciate the influence of various business practices on environmental management at various levels. Existing literature on marketing provides various ways in which green marketing practices can influence environmental management in various sectors. This paper examines the significant role that green marketing practices play on the management of the environment with particular focus on Machakos County of Kenya. The first section of the paper discusses some of the key concepts and development of green marketing. The second section of the paper highlights the environmental management issues affecting Machakos County whilst the third section focuses on the role that green marketing practices can play in addressing environmental challenges in the County. The potential challenges in applying the green marketing concept in environmental management in the County are highlighted.

Key words: *Marketing, Green marketing, Environmental management; Green processes*

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Policy and Institutional Mechanisms for Drought Management in Kenya

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Abstract

In many parts of the world, the approach to drought management is generally reactive and focuses on crisis management and both at national and regional scale, responses to drought occurrence are often tend to be untimely, poorly coordinated and lacking the necessary integration. Consequently, the economic, social and environmental impacts of droughts have increased significantly in many regions of the world. This piecemeal way of managing droughts is unsustainable since it is driven by crisis rather than prevention. Since there is knowledge, experience to reduce the impacts of

drought, what is required is a regulatory framework and action at the national level to manage the impacts of drought in the country. In this paper, the existing policy and institutional framework for drought management in Kenya is described with a view to identifying the gaps that exist and recommending how those gaps can be filled to ensure effective drought management in the Country. It is concluded that without a well-coordinated national drought policy and institutional frameworks, the country will continue to respond to drought in a reactive rather than a proactive way. In conclusion, it is noted there is need for effective monitoring and early warning systems, effective drought impact assessment procedures, proactive drought risk management measures and drought preparedness plans to increase coping capabilities and effective emergency response programmes to reduce the impact of drought in the Country.

Key words: *Drought, Drought Management, Policy, Early Warning System*

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A Critical Examination of the Effectiveness of Exhibition Events in Promoting the Tourism Industry in Kenya: A Case of Nairobi CBD

Nzioka, Alice Mueni¹, Juliet Magoma Mesa², Jane Jebet Bitok³
¹Machakos University
²Kenyatta University

Abstract

The Tourism industry is a significant economic activity in most countries around the globe. In Kenya tourism has been identified as one of the major national development sectors for realizing the country's Vision 2030, through the development and diversification of the tourism products as well as an expansion in the MICE tourism segment. This study examined the effectiveness of exhibition events as a tool for promoting the tourism industry in Kenya. A cross-sectional descriptive design was adopted for the study. The population comprised all exhibition events visitors and exhibitors.in Nairobi CBD. The findings indicate that exhibition events create additional demand for the tourism and hospitality sector. Recommendations for policy and practice are presented.

Key words: *MICE, Exhibition Events, Tourism*

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Assessment of heavy metal concentrations in Nile tilapia (*Oreochromis niloticus*) from an urban stream in Machakos town, Kenya

Sabina Emilly Dimba and Julius Nzeve
Machakos University

Abstract

The presence of heavy metals in freshwater fish represent is a global public health challenge. In this study, the main objectives were to determine the heavy metals concentration (Cd, Cr, Cu, Pb, and Zn) in fish and the physicochemical water parameters (pH, temperature, DO, TDS, EC) for water from river Mwanja and Katumani stream. The physicochemical water parameters were measured on site using Multi parameter water quality kit. The fish samples of different sizes were purchased from the local fishermen in the two sampling sites. They were placed in a cool box then transported to the Machakos University Biology laboratory. In the laboratory, the fish samples were weighed using electronic weighing balance and measurements of the lengths were recorded. The fish samples were then transported to the University of Nairobi, Upper Kabete Veterinary Laboratory, and the fish were cleaned and then dissected to get the muscles. The muscles were composited for the analysis. The levels of heavy metals were determined by the use of atomic absorption spectrophotometer. The Independent T-test was used to do the analysis and to test the significant different ($p > 0.05$) of heavy metal concentration (mg/kg) in Tilapia fish muscles and physicochemical parameters in water. Cd (0.006-0.009), Zn (2.451-3.008), Cu (0.081-0.117), Pb (0.037-0.049) were found to be within the WHO acceptable limits for fish and fish products while Cr (0.035-0.066) exceeded the set limit. The mean level values of physicochemical parameters in water were; pH (0.176-0.568), DO (1.143-3.020), TDS (8.353-26.799) were within WHO permissible limits while Temperature (1.738-2.810), and EC (15.239-43.029) exceeded the set limits. Concentrations of heavy metals in Tilapia fish muscles were below the World Health Organization (WHO) set limit except for Cr and the level of the parameters were within the WHO limit except Temperature at Katumani and EC in both sites. Results from this study demonstrate the need for an ecosystem approach towards sustainable management of rivers and streams. This will curb aquatic pollution, which is a health risk for people consuming aquatic resources contaminated with heavy metals.

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Assessment of toxic heavy metals in sewage sludge from Decentralized Treatment Facility in Machakos town, Kenya

Mercy Mulyungi and Julius Nzeve
Machakos University

Abstract

The increasing global population alongside the growing consumption of water resources has led to an escalation in the amount of sewage sludge produced in urban areas. Machakos Town has a Decentralized Treatment Facility (DTF) serving in treatment of waste water from all the learning institutions, residential areas, and businesses in Machakos town that are not connected to the main sewage treatment facility at Mitheu. The sewage sludge collected from the DTF waste treatment process is sold to local farmers as a fertilizer to boost their agricultural production. However, studies have revealed that sewage sludge contains traces of heavy metals that harbor potential harmful effects to humans and the environment. This study therefore investigated the levels of toxic heavy from sewage sludge obtained from treatment facility. The samples were collected twice from three sampling points in Machakos DTF sludge shade for the analysis of heavy metals (Lead, Mercury, Cadmium and Chromium, arsenic, copper, zinc, selenium). The samples were then transported to Kenya Plant Health Inspectorate Service (KEPHIS) for analysis. The data from laboratory analysis was analyzed via a computerized Statistical Package for Social Science (SPSS). The data was subjected to Independent T-Test. This was then compared to FAO and EU accepted standards as well as the united states environmental protection agency standards. Some of these heavy metals, like nickel and zinc were very high beyond the permissible set standards of FAO and EU. Therefore, this dried sewage sludge was not recommendable for use as manure in agriculture because of their high levels of the metals which leads to accumulation in soil and crops hence risk to human health and the environment.

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Assessment of water quality from Manza River in Machakos town, Kenya

Petronila Adhiambo & Julius Nzeve
Machakos University

Abstract

Over the years, human impact on the environment has triggered changes in water quality. This has been caused by point and non-point sources of pollution. This study investigated the effects of human activities to the water quality of Manza River in Machakos Municipality, Kenya. Manza River is one of the rivers that pour its waters into Maruba dam. In this study, samples were collected in triplicates at four selected sites along the river course bi-weekly for one and a half months. The water samples were tested and analyzed in the laboratory for bacterial count; *E-coli* and *Total coliforms* and eight physicochemical water parameters. The parameters which were measured onsite were; temperature and dissolved oxygen and in the laboratory; turbidity, electrical conductivity, pH, nitrates, nitrites and sulphates. One-way Analysis of Variance was used for data analysis to compare mean values of the different parameters measured at different sampling sites ($p=0.05$). The results obtained were; Conductivity (64.20 to 974 μ s/cm), Nitrates (0.50 to 2.00mg/l), Sulphates (0.89 to 14.56mg/l), Nitrites (0.0009 to 0.08mg/l), Dissolved Oxygen (1.40 to 4.70mg/l), and pH (6.55 to 7.65). They were all found to be within the WHO drinking water standards.

However, *E-Coli* (0 to 53.33MPN/ml) and Total Coliform (1472.22 to 1777.78MPN/100ml) exceeded the WHO limits. This is a pointer of bacteriological contamination of the water due to human activities and especially releasing of effluents from septic tanks by the residential estates along the Manza river. Therefore, the relevant agencies such as National Environment Management Authority, Water Resource Authority and Department of Public Health should closely monitor the human activities carried out along the river and sensitize the public on the importance of protecting the catchment.

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Policy Framework on the Conservation and Management of Riparian Lands in Kenya

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Abstract

Riparian lands are important components of functioning, healthy aquatic and terrestrial ecosystems. Healthy riparian lands are critically important landscape components, providing environmental, economic, cultural and recreational benefits. However, the extent and health of riparian lands has declined in most areas in Kenya. This is partly because riparian lands are inadequately defined with many of the definitions based on the objectives and the field of interest. In addition, the environmental legislation framework in Kenya is marked by a series of legislations on environment protection which are scattered across different laws or Acts of Parliament. This aspect in diverse laws has led to legal and policy conflicts earmarked with uncoordinated implementation of sectoral and management plans in natural resources management and environmental protection which has greatly affected sustainable management of riparian lands. This paper looks at the current state of riparian lands against the needs of relevant sectors and proposes recommendations for improving riparian land conservation and management in Kenya. A review of the existing legal, regulatory and policy frameworks indicated a number of gaps and opportunities from the conservation of riparian lands in Kenya. Most of the legislations and regulations regarding riparian lands conservation and management are scattered in a range of resource and sectoral specific Acts, regulatory and policy documents. With regard to institutional settings, there is a lack of coordination, lack of or poor enforcement, lack of manpower, and in many cases lack of a clear management plan for the riparian areas. There is also political influence and overlapping mandates between or amongst institutions. This confusion between the existing Acts, regulations and policies hamper implementation and result in a lack of practical guidelines for enforcement officers on the ground. Therefore, there is need for the various sectors and institutions involved in management of riparian lands to derive a working definition of riparian lands and their extents to guide the operation of these sectors/institutions. These country strategies and outcomes will also help land managers in conservation and management of riparian lands.

Key Words: *Stewardship, Riparian land, Ecosystem, Policy.*

SUB-THEME 2 – INNOVATIVE RESEARCH ON ARTIFICIAL INTELLIGENCE, BIG DATA, BLOCKCHAIN TECHNOLOGY AND MACHINE LEARNING FOR SUSTAINABLE DEVELOPMENT;

AND

SUB-THEME 3 - MATHEMATICS, STATISTICS AND DATA SCIENCE FOR SUSTAINABLE DEVELOPMENT

Mathematical Modelling of Inclined Magnetic -Field Effect in Bio-Convection Flow of Magneto-Cross Nano-Fluids

Sammy Maingi,
Department of Mathematics, Machakos University

Abstract

This research addresses the influence of an oppositely transverse inclined magnetic field on bio-convection flow of magneto-cross Nano-fluid containing gyrotactic microorganisms in presence of an activation energy. Appropriate similarity transformations will be involved to transform the modeled partial differential equations to Ordinary differential equations which will be solved numerically using Collocation method. A mathematical model will be developed to explain in details the impacts of magnetic field effects in inclined position to a cross Nano-fluid past a stretching sheet with thermal and radiation effects. The effects of heat source and binary chemical reactions together with convective boundary conditions will be analyzed. Contribution of different emerging parameters on thermal, concentration, velocity and micro-rotation profiles will also be analyzed. The results will be displayed in tabular and graphical forms.

Keywords: *Bio-convection, Gyrotactic micro-organisms, magneto-cross Nano-fluid, transversely inclined magnetic field, activation energy*

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Effects of Mastery Learning Strategy on Mathematical Competence among Secondary School Students in Kenya

Mary M. Mulungye
Machakos University

Abstract

The purpose of this study was to investigate the effects of mastery learning strategy on mathematical competence among secondary schools students in Kenya. To achieve the objective a sample of one hundred and fifty four (154) form two students from two schools were randomly placed into either the group taught by using Mastery Learning Strategy (MLS), the experimental group or those taught using Conventional Group Learning (CGL), the control group. The two groups were subjected to a competence test, attitudinal test towards mathematics, errors and misconception assessment test and the level of self-efficacy test before and after the intervention of MLS. The Analysis of Variance (ANOVA), Chi-Square and Z scores test statistics were used to test whether the two groups' level of competence test achievement in Mathematics, attitude towards mathematics, magnitude of errors and misconceptions committed and level of self-efficacy differed significantly at $\alpha = 0.05$ significance level. Based on the study findings, the competence test mean score was 18.36 with a standard deviation of 17.34 and 28.27 with a standard deviation of 17.96 for the control and the experimental group respectively after the MLS

intervention. The analysis of variance indicated that the mean score difference was significant at $\alpha = 0.05$ as evident by the Fishers ratio and p-value of $F = 12.334 > F_{0.05, 1, 152} = 3.90$ and ($Pr = 0.023 < 0.05$) respectively. The attitudinal test showed that 36.4% of the students from the experimental group had a negative attitude towards mathematics compared to 58.3% of students from the control group. The computed z score value of $|-2.72|$ was greater than the critical value of $z = 1.96$ at 5% level of significance, therefore the proportion difference between the two groups was statistically significant. The study recommends a replication of the research to another region and respondents to ascertain the validity and reliability of the findings.

Key words: *Mastery, learning strategy, competence test achievement, mathematical competence*

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**Numerical Modelling and Simulation of Carbon-Based
Nanofluid in Augmenting Thermal Conductivity in a Parabolic Solar Collector**

Lucas Khaoya Mukwabi
Machakos University

Abstract

In this research proposal, an unsteady hydro-magnetic flow of carbon-based nanoparticles (i.e., graphene) dispersed in pure water as the base fluid in the presence of an induced magnetic field over a trough-shaped parabolic surface and with varied fluid properties has been proposed. Boundary layer approximations will result in a system of partial differential equations that will be transformed through the similarity transformation technique into ordinary differential equations for simplified computation. The collocation method will be employed to numerically solve the resulting systems of ordinary differential equations into a set of algebraic equations, which will be simulated using MATLAB to analyze the profiles of the flow variables. The simulation results for the velocity, temperature, species concentration and magnetic induction profile, skin friction coefficient, and heat and mass transfer rates will be discussed. The formidable physical parameters affecting fluid movement, temperature difference, and skin friction around the boundary will be presented in graphs and tables and numerically discussed.

Analysis of Arrhenius Activation Energy in an Electrically Conducting Fluid Flow with Chemical Reaction and Viscous Dissipation

Nyundo Stephen Kaingu(KU), Mutuku Winifred Nduku and Ngesa Joel

Machakos University

Abstract

This paper explores the advances in an electrically conducting reactive fluid flow in an elongated porous surface while considering the Arrhenius activation energy, viscous dissipation and chemical reactions in the fluid. A uniform magnetic field is imposed orthogonal to the fluid flow and the resulting nonlinear equations generated. The similarity variables are induced to transform the partial differential equations into dimensionless equations and solved numerically using the finite difference methods. To analyze the parameters affecting the flow, graphs and tables will be displayed after solving the equations on computer generated programs. This study also reported that activation energy parameter enhances concentration profiles, whereas fitted rate constant shows opposite behaviour. The effect of Schmidt number, Nusselt number and the Sorret parameter on the flow will also be discussed with the velocity and temperature profiles analyzed and displayed graphically.

Key words: *Arrhenius activation energy, chemical reactions, non-linear equations, Nusselt number, Sorret parameter*

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Application of Expansive Mapping on Fixed Point Theorem in Metric Spaces

Koeh Vincent
Chuka University

Abstract

Application of Fixed-Point Theorem has tremendously increased in different areas of interest and research. Fixed Point Theorem presents that if $T: X \rightarrow X$ is a contraction mapping on a complete metric space (X, d) then there exists a unique fixed point in X . A lot has been done on application of contraction mapping in Fixed Point Theorem on metric spaces such as cantor set with the contraction constant of $\frac{1}{3}$, the Sierpinski triangle also with contraction constant of $\frac{1}{2}$. On the other hand, a mapping $T: X \rightarrow X$ on (X, d) such that $\forall x, y \in X: d(Tx, Ty) \geq d(x, y)$ is called an expansive mapping. Under expansive mapping the object distance is usually shorter than the image distance. There are various types of expansive mappings such as; isometry expansive mapping, proper/strict expansive mapping and anticontraction expansive mapping. From the available literature, Fixed Point Theorem has been derived using contraction mapping approach. In this study, the relationship between contractive and expansive mapping shall be utilized, with an

intention to determining the derivation of Fixed-Point Theorem using the expansive mapping approach. Furthermore, the application Fixed-Point Theorem using expansive mapping approach shall be determined. The concepts of isometry, Strict expansion, proper expansion and anti-contraction will be applied to achieve the application of expansive mapping in fixed point theorem. The outcome of this study will be useful in areas such as the game theory in economics on how and why people make decisions, as in theory of differential and integral equation especially in initial value problems (IVP) and its applications in physics and engineering by utilizing the concept of expansive mappings application in Fixed Point Theorem.

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Unsteady Hydromagnetic Flow of Hybrid Nanofluid in Aparabolic Thermal Solar Collector

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Abstract

Exploiting nanofluids in thermal systems is growing day by day. Nanofluids having ultrafine solid particles promise new working fluids for application in energy devices. The study investigates an unsteady hydromagnetic flow of Cu-TiO₂/water hybrid nanofluid in a parabolic thermal solar collector with variable fluid properties. The similarity transformation technique was used to transform the governing partial differential equations to ordinary differential equations for easy computations. The resulting system of ordinary differential equations will be solved numerically using collocation method and simulated in MATLAB software to obtain the profiles of the flow variables. The simulation results for the velocity, temperature, species concentration, and magnetic induction profiles as well as the skin-friction coefficient, local Nusselt number and local Sherwood number will be presented graphically and in tabular forms. A discussion of the effect of different flow parameters on the motion of the nanofluid, temperature variation, species concentration, magnetic induction, skin-friction coefficient and the rates of heat transfer and mass transfer will be concluded. The results that will be obtained from the study will help the manufacturing industries to design and manufacture efficient thermal solar collectors, which will be economical in the long run.

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Fog-To-Cloud continuum fault tolerance: A systematic review

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Abstract

Fog computing (FC) is an emerging distributed computing platform aimed at bringing computation close to its data sources. This reduces cost of delivering data to a remote cloud. However, it faces reliability and dependability issues due to node mobility and resource constraints. Therefore, this paper focuses on fault tolerance by carrying out survey on state-of-the-art review on resilience of fog computing. The study adopted PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) method, where a systematic review was performed on eligible articles. Three databases were searched and articles published from the years 2017-2022 were analyzed and selected, IEEE Explore, Springer Link and Google Scholar. The findings show growing interest in the topic but relative immaturity of the technology. Two problems have attracted special interest: guaranteeing reliable data storage in systems with unreliable and untrusted nodes and securing efficient task allocation in the presence of variable computing load. Redundancy-based techniques, both static and dynamic, dominate the architectures of such systems. Reliability, availability and Quality of service are the most important dependability requirements for fog-to-cloud computing. Block chain technology has not been fully explored to provide tolerance once fault occurs in the fog-to-cloud continuum, despite of its suitable characteristics. This provides an opportunity for further research. Block chain has been used in various scenarios to provide tolerance through the scalable side chain and off-chain scaling strategy.

Key words: *Blockchain, Fog Computing, fault tolerance, fog reliability, edge computing*

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Conversational Artificial Intelligence for Higher Education Support.

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Abstract

Research in Artificial Intelligence is growing and expanding in today's world. Technocrats have observed a twelve percent annual increase in AI research and innovation. Countries like China, United States and Japan are leading production of AI technology. The emergence of the covid-19

pandemic disrupted the higher education sector which prompted an expanded mindset on how to deliver academics virtually while still maintaining set quality standards. Face to face mode of teaching and communication has been the tradition. The impromptu restrictions conditioned a change in mode of learning and service delivery. Insightful data showed that the stakeholders had to switch to virtual meetings since there was no more physical attendance of lectures, conferences, and research activities. This study explores the use of AI powered conversational agents to facilitate real-time engagement in higher education. AI conversational agents use natural language processing to understand user requests and deliver intelligent responses. Unlike the ordinary chatbots, this study involves deployment of a customized AI chatbot. The objective is to design and develop an intelligent chatbot prototype for the student and staff. This study implements IBM Watson Studio intelligent virtual agent called the Watson Assistant, which allows customization of the chatbots' front-end and back-end. The conversational AI uses knowledge intents for language processing. The system is continuously trained using existing data and the output monitored to validate the effectiveness of its performance. The chatbot system acts as a conversational agent for various support purposes in higher education sector. Chatbots are known to improve concentration, communication and productivity. Chatbots are effective in assisting tutors and minimizing ambiguity. This study has outlined the graphical user interface design and recommendations for further improvement.

Keywords: *Artificial Intelligence, Higher Education, Conversational Agents, Intelligent agents, Chatbots, Machine Learning, IBM Watson, Algorithms*

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Pollutants in Wastewater : A Novel Way of their Determination

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Abstract

In Kenya, Cancer is estimated to be the second leading cause of non-communicable diseases related deaths after cardiovascular diseases and accounting for 7% of overall national mortality. Pollutants such polyaromatic hydrocarbons (PAHs) and hydrazine have been classified as human carcinogen by the Environmental Protection Agency (EPA). In addition, their exposure to humans has been found to damage the liver, kidney, lungs and respiratory tract system and has long-term effects on the central nervous system. Due to these side-effects, it is highly desirable to fabricate portable, economical, sensitive and rapid methodologies for the determination of polyaromatic hydrocarbons and hydrazine. This work focuses on the methodologies of harnessing the unique properties of electro-conductive polymers and nanomaterials and their application in sensor technology. A highly sensitive, rapid and simple electrochemical sensor for the detection of polyaromatic hydrocarbons and hydrazine has been developed using graphenated polypyrrole-Ag-Au nanoalloys nanocomposite. The results showed that the synthesized nanocomposite exhibited excellent characteristics for their application in the development of highly sensitive, cheap and easy to use electrochemical sensors for hydrazine detection.

Key words: Hydrazine, Nanoalloys, Cyclic voltammetry, Carcinogen, Overpotential

Effect of FinTech on Share Price and Profitability of Listed Commercial Banks in Kenya, Uganda and Tanzania

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Abstract

The technology industry has advanced to the point where it has altered the way people do things. The global expansion of financial technology companies poses a threat to retail banks because financial technology provides better alternatives to banks from the comfort of our own homes. The purpose of this study is to determine the impact of financial technology on the banking industries of Kenya, Uganda, and Tanzania. The primary variables under consideration are bank profitability and share price. Because there has been little research on this topic in the East African Region, such a study is desperately needed. The information was gathered from publicly traded banks in Kenya, Uganda, and Tanzania. This study included twenty banks in total, with data spanning a five-year period between 2015 and 2019. The findings show that there is still a positive impact on bank profitability. Notwithstanding, the share price fluctuates from year to year, making it impossible to determine whether it is precipitated by Fintech because many other factors are at play.

Keywords: *Technology, FinTech, Share Price, Profitability, Listed Commercial Banks*

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**SUB-THEME 4 - ENGINEERING ISSUES IN EDUCATION IN THE ERA OF
DISRUPTIVENESS**

Petrophysical Analysis of Gas and Oil of Anza Basin Using Techlog Software

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Abstract

Petrophysical analysis required the use of techlog software for data analysis and interpretation. The results obtained helped to determine porosity, permeability, net reservoir height and lithological profile. The nature of profiles in terms of sand, shale and sandstone revealed net reservoir height at different zones of the well. The data used for analysis purposes was obtained from Sala well, Anza basin, at the National Oil Corporation of Kenya (NOCK) data center. Techlog software was used to obtain efficient results for the analysis processes. The analysis and interpretation of the results showed positive presence of hydrocarbons in Sala well in terms of porosity, permeability and net reservoir height; as well as distinct lithological profile.

Key words: *Petrophysical, techlog software, lithological profile*

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Sommerfeld's Coefficient of a Boson-Fermion Pair Condensate in High Temperature Superconductors

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Abstract

High temperature superconductivity has shown dependence on the interaction between a finite momentum Cooper-pair boson and a fermion. The occurrence of a superconducting energy gap in cuprates is defined by collective excitation of boson-fermion pair condensates (BFPC) above the ground state. The ground state energy of the system represents its total internal and has been used to determine Sommerfeld's coefficient of a BFPC in high temperature superconductors. Atypically, the study is furthered by linking the theory to experiments, through extrapolations, leading to high-precision results both in cuprates and iron-based superconductors. For instance, the Sommerfeld's coefficients of the model in $\text{YBa}_2\text{Cu}_3\text{O}_7$ and $\text{Ca}_{0.33}\text{Na}_{0.67}\text{Fe}_2\text{As}_2$ are found to be $30.36\text{mJmol}^{-1}\text{K}^{-2}$ and $114.1\text{mJmol}^{-1}\text{K}^{-2}$ respectively while the empirical ranges in these materials are $30 \pm 5\text{mJmol}^{-1}\text{K}^{-2}$ and $105 \pm 5\text{mJmol}^{-1}\text{K}^{-2}$ respectively.

Keywords: *Boson-fermion Pair Condensate, Ground-state energy, Specific heat, Sommerfeld's Coefficient*

Evaluation of UV-Blocking Film on the Greenhouse Solar Dryer Performance and Drying Kinetics of Tomato

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Abstract:

Post-harvest losses particularly in horticultural crops continue to contribute to the already widening gap between food demand and supply. Drying is one of the novel techniques that has been employed to mitigate these losses. In this study, the effect of UV-blocking film on the thermal performance of greenhouse solar dryer and drying kinetics of tomatoes was evaluated. Two greenhouse solar dryer models were developed and one clad with a 200 μm UV-blocking cover (treatment) and the other one clad with a 200 μm UV-transmitting cover (control). Temperature, relative humidity, windspeed, and solar radiation data was recorded using CR1000 Logger Net data logger while the weight of the drying tomatoes was measured hourly using a weighing scale. The ambient relative humidity and temperature ranged from 20.47-63.91% and 18.83-32.86 $^{\circ}\text{C}$ during the drying. The ground and room temperature ranged from 20.77-54.43 $^{\circ}\text{C}$ and 29.92-60.42 $^{\circ}\text{C}$ for UV-transmitting greenhouse solar dryer and 19.92-42.22 $^{\circ}\text{C}$ and 28.7-52.5 $^{\circ}\text{C}$ for UV-blocking greenhouse solar dryer. The UV-transmitting dryer registered lower mean relative humidity 14.69% compared to 16.8% recorded for the same period in UV-blocking dryer. The 5 mm thick sliced tomatoes were dried from an initial moisture content of 2113.36% in both dryers to a final moisture content of 14.43% and 44.39% in UV-transmitting and UV-blocking dryer, respectively, in 15 hours. Non-linear regression analysis established Page model as the best fit in describing the drying models of tomatoes in both dryers with R^2 of 0.9974 and 0.9932, χ^2 of 0.00027 and 0.00072, RMSE of 0.0154 and 0.0252, ϵ (%) of 23.93 and 29.48 for UV-transmitting and UV-blocking dryer, respectively. In addition, the UV-transmitting dryer registered an average drying rate of 58.22 g/hr compared to 51.16 g/hr recorded in UV-blocking dryer. Moreover, higher effective moisture diffusivity of $6.33 \times 10^{-12} \text{ m}^2/\text{s}$ was established in UV-transmitting dryer compared to $5.07 \times 10^{-12} \text{ m}^2/\text{s}$ established in UV-blocking dryer.

Keywords: Greenhouse solar dryer, UV-blocking, UV-transmitting, tomatoes, postharvest losses

Opportunities for investment in Kenya's Mineral Sector

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Abstract

Kenya, a Democratic Republic located in East Africa, astride the Equator with a surface area of 582,650 sq km and an estimated population of about 46 million people (Census, 2019). Apart from the country being endowed with a rich cultural heritage, numerous wildlife species and beautiful scenery; thus forming one of the preferred tourist destinations of the world, it significantly also possesses substantial untapped mineral resources potential that remains largely underexplored. The Government of Kenya recently enacted the Mining Act (2016) which creates of an enabling mining environment, fiscal and legislative framework with a view to attracting increased investments in the mineral sector. The position of the country at the heart of East Africa and its direct access to the sea makes it a strategic business partner in the region, especially in the area of mineral resources development, value addition and trade. The premise of this paper, therefore, is to bolster diverse geology of Kenya and its overview occurrences of potential minerals, with significant prospects of finding new deposits through geological mapping and mineral exploration rationale.

Keywords: *Kenya, untapped mineral resources potential, Mining Act, enabling mining environment, geological mapping and mineral exploration*

Influence of Head of School Culture of Planning and Controlling In Provision of Guidance and Counselling in Secondary Schools in Bunda District in Tanzania

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Abstract

The purpose of guidance and counselling in schools is to improve academic achievement, foster positive study attitudes and habits, increase acquisition and application of conflict resolution skills, and decrease school drop-out rates. The research examined the influence of head of school culture of planning and controlling in provision of guidance and counselling in secondary schools. Based on the study, this paper discusses how head teachers as managers plan and control for provision of guidance and counselling services in community secondary schools in Bunda District in Tanzania. The study adopted Fayol's Educational administrative and Education management theory by Tony Bush. It employed mixed methods approach and was conducted using descriptive survey design. Data was collected from one hundred and sixty participants from Bunda community secondary schools. Descriptive statistics such as frequencies and percentages were used to analyse data generated from questionnaires. Data from interviews were transcribed and organized into themes. The findings of the study showed that head teachers did not have a culture of planning and

controlling for provision of guidance and counselling service in their respective schools. Based on these findings, it was recommended that head teachers should seriously plan for the provision of guidance and counselling by showing it in an action plan. Head teachers also need to organize guidance and counselling services by providing counselling offices where privacy is made a priority.

Keywords: *Head Teachers, School Managers, Provision, Control, Guidance, Counselling Services, Community Secondary Schools, Bunda District, Tanzania*

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Opportunities to learn and use Information Communication Technology in Teaching and Learning by Teachers with Visual Impairment in Dar es Salaam, Tanzania

By

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Abstract

The use of computer has become a common practice in education. Many countries have been campaigning for E-learning, E-schooling, and long distance learning. It has been a force to promote and improve performance of teachers and pupils. Current situation indicates that many Teachers with Visual Impairments do lack ICT skills and schools do not have adequate ICT teaching and learning facilities to support effective teaching. Hence, this study aimed at investigating on the opportunities to learn and use ICT in teaching and learning by TVIs in Dar es Salaam, Tanzania. The study employed descriptive survey design under mixed research approach. Population of this study comprises TVIs, District Educational Officers, and heads of primary schools, sighted teachers and pupils. A sample of 277 participants was selected using simple random technique and purposive sampling. Data collected with the use of questionnaires, interview and focus group discussion method. Data collected was analyzed by using descriptive statistical analysis for quantitative data and thematic analysis for qualitative data, and presented through the use of graphs and themes. The study presented possible opportunities that TVIs can exploit ICT in teaching and learning including; TVIs efforts to seek ICT skills and ICT devices, through advocating and use of legal aid and policy documents present in the country to influence employers and development partners to support their efforts in this endeavor. And the study recommended that different actors

to continue raising awareness on the issues of people with disabilities and their needs and rights, so that full inclusion in all spheres of life is achieved especially in education provision.

Key words: Teachers, Visual Impairment, ICT, Primary School.

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Nafasi ya Makavazi ya Elimu na Utamaduni Tanzania katika kuhifadhi kazi za Taaluma za Kiswahili: Mifano kutoka Isimu ya Kiswahili

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Ikisiri

Katika taaluma ya elimu, imezoeleka kwamba maktaba ni sehemu muhimu ambayo jamii hupata maarifa kwa njia ya kujisomea. Mkazo umewekwa katika kusoma vitabu na wala sio uanzishaji wa makavazi ya Elimu na kitamaduni itakakohifadhiwa Vitabu na masuala mengine kuhusu taaluma hivo. Lengo la makala haya ni kujadili nafasi ya Makavazi ya Elimu na Utamaduni katika kuhifadhi kazi za Taaluma za Kiswahili. Makala haya yatachangia uelewa wa namna ambavyo Wanaisimu-Watanzania wanavyoendelea kukuza lugha ya Kiswahili na kufahamu maeneo mbadala ya kupata maarifa yanayohusu Kiswahili na wataalamu waliochangia kuandika na kuyaweka maarifa hayo vitabuni. Uhifadhi wa Makavazi ya Elimu utasaidia jamii katika kufahamu masuala ya kihistoria na kiutalii kwa maslahi mapana ya wa-Tanzania kwa jumla.

Dhana Muhimu: isimu, kiswahili, taaluma za Kiswahili, makavazi, utamaduni, utalii

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Ekegusii Ecological Oral Traditions for Language Learning

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Abstract

Ekegusii is a Bantu language of the Abagusii spoken in the South Western Kenya. It has rich ecological oral traditions which are largely undocumented. The language is mainly spoken among adult populations and is not written. Ekegusii is used alongside English and Kiswahili which have a comparative advantage as co-official languages and therefore are the languages of choice for young populations. Endangerment of Ekegusii is imminent and so is depletion of natural ecosystems due to climate change and human activity. **This paper seeks to explore the possibility of creating Ekegusii ecological oral traditions data sets for language learning tasks and environmental conservation.** Data emerging from such work will be used for materials preparation activities and also for the preparation of technologies for Ekegusii-English learning

tasks. The work is timely for three reasons: First, it aligns itself with the United Nations International Decade of Indigenous Languages (2022–2032) which aims to raise global awareness about endangerment and importance of indigenous languages for sustainable development (Camara-Leret & Bascompte 2021). Second, as the Competency Based Curriculum is being rolled out in Kenya, Ekegusii (among other indigenous Kenyan languages) has been integrated into the basic education curriculum yet indigenous ecological knowledge databases to provide input for language learning activities are lacking. Third, datasets from the work will spur research; information management and product development among herbalists, ecolinguists, and conservationists. Finally, the datasets will supplement efforts at conserving and restoring forests as a natural ecosystem in keeping with one of the key resolutions from COP26 in Glasgow.

Key words: *ecological oral traditions, indigenous languages, data sets, language learning*

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Reflection on the Innovative Solutions for Solving English Language Educational Challenges in Secondary Schools, Tanzania

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Abstract

English it is among the major languages that connects people around the world. Although, many nations have been using English as a language of instruction in different levels of education, learning English language as the second language is still a challenge. Studies conducted in Tanzania revealed that teachers and students are facing numerous challenges. Literature in this 21st suggested that new technologies enhance teaching and learning of English language all over the world, especially in solving educational challenges through innovation. Innovation can be understood as an attempt to bring about beneficial change. Thus, this desk top research sought to establish various innovative solutions presented in existing literature to enhance teaching of English Language in Secondary Schools, Tanzania. It was found that innovative strategies such as the use of digital platforms: applications (apps), websites, mobile phones provide opportunities for learning resources and long distance learning through the use of internet, these helps teachers and students to create space for learning English language. Moreover the studies revealed that students learn faster through using technology and internet tools. Due to the availability of innovative solutions to the existing challenges in teaching and learning English, the study concluded that the use of digital platforms, applications (apps), websites, and mobile phones should be adopted in schools by the school administrators and teachers to improve teaching and learning. In line with that the education administrator should ensure effective use of innovative strategies in the process

of teaching and learning process. Also, teachers should effectively adopt the use of innovative strategies in the teaching English language.

Keywords: *Innovation, English language Education, Teaching*

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Re-configuring the Rights to Education through Play with Painting and Clay Modeling among children affected by psychosocial effects of COVID-19 pandemic

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Abstract

The article 43(1)f, 53(1)b and 55(a) of the Kenya 2010 constitutions on the rights to education was infringed by disruption of COVID-19 pandemic. The Government of Kenya disadvantaged UNDP-SGDs (2015) goal on; *Quality Education*, and UNICEF (2018) on; *Every Child Learns* to enforce the social distance policy. Prior to the outbreak of COVID-19 pandemic, UNICEF (2018) cautioned any attempt to inhibit Child learning’s welfare such as play among others, would cause negative affect to the growth and development of a child. Modern educationists have asserted that play with art, plays a role in cognitive and social learning; to an extension of recreation and elaboration of conflicts. The paper will re-configure rights to education through play with paintings and clay modeling to among children affected by psychosocial effects of the COVID-19 pandemic. The researcher will focus on the desktop research design and psychoanalysis instrument to create a discussion on the paper. The paper would acknowledge the mission of WHO (2020), UNDP-SGDs (2015), UNICEF (2018) and article 53(1)d of Kenyan 2010 constitution on *Good Health to All Children*. The paper intents to merit play with painting and clay as a profound tool to re-configure rights to education among children affected by psychosocial effects of COVID-19 pandemic. It will finally suggest a workshop or seminars for play with painting and clay modeling to champion the rights to education among children in schools.

Keywords: *psychosocial effects, COVID-19 pandemic, play, children, paintings, clay modeling, rights to education*

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Language Problems in the Family Planning Interactions at Machakos Level 5 Hospital, Kenya

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Abstract

According to the United Nations Department of Economic and Social Affairs (2017), there are 63 % of women use some form of contraception globally. However, in Kenya and particularly Machakos County, there is low uptake of family planning uptake which stands at 49.7%. Previous research has shown that family planning is not only a health issue but also a cultural and linguistic concern. The purpose of this paper is to analyse language problems in family planning discourses at Machakos Level 5 Hospital. The maxims in the Cooperative Principle by Grice (1975) and in the Politeness Theory (see Leech, 2014) provided norms that characterize ideal communication situations. Deviations from these norms yielded language problems for analysis based on Language Management Theory (LMT). Thirteen (13) in situ service seeker – service provider interactions were observed and audio-recorded. Follow-up interviews involving the participants were carried out to seek explanation and clarification for the nature of language problems evident in family planning contexts in the health facility. Guided by tenets of the Language Management Theory, the data were analysed qualitatively. Findings revealed that the maxims of the Cooperative Principle and those of the Politeness Theory were violated thereby causing language problems. The study also indicates that the language problems were evaluated negatively. The paper concludes that family planning service providers lack the socio-cultural and linguistic skills needed to offer services in a diverse socio-linguistic and cultural environment. For effective service delivery, the paper recommends that Machakos Level 5 hospital offers tailor-made management interventions that address language problems noted.

Keywords: *Language Management Theory; Maxim, Cooperative Principle, Politeness Theory, Language Problems, Service Delivery*

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Parents' Perceptions on the Teaching of Indigenous Languages in the CBC Curriculum: A Case Study of Schools in Kiambu County, Kenya.

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Abstract

The Competency Based Curriculum (CBC) which has already been adopted in Kenya to replace the 8-4-4 system of education aims to increase skills development and instill values in the learner.

This will be achieved through the teaching of various subjects as contained in the Basic Education Curriculum Framework (BECF). One of the languages to be taught is Indigenous languages from lower primary to junior secondary. There is consensus among scholars that Parental empowerment and engagement in the learning process is essential to the learner's growth and development. It is against this background that the current study seeks to find out the parent's perception about the teaching of indigenous languages in schools. The study used quantitative and sample survey approach with a respondent sample of 150 parents from 10 primary schools in Kiambu county which have been selected by the Ministry of Education (MoE) to pilot the teaching of indigenous and foreign languages. Parents of children attending grades 4-6 were sampled and data collected through questionnaire. The study was conducted in the months of February and March 2022. The result shows that 111 (74%) of parents used mother tongue at home with their children, 27 (27%) used Kiswahili while 12 (8%) used English with their children. The study also found that 27(18%) used mother tongue in church, 51(34%) used Kiswahili while 72(48%) used English in church services. On the benefits of indigenous languages only 16% found it beneficial while 84% did not. As a result of the findings of this study, policymakers and educational institutions will be required to do a lot of sensitisation on the need to empower the children with indigenous language skills for the policy to succeed. A lot of emphasis must be placed on the benefits of using indigenous languages particularly the role they play in the learning process.

Key words: *Language policy, Indigenous languages, discourse domain, competency-based curriculum (CBC), Basic Education Curriculum Framework (BECF), language ideology*

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Analysis of Conceptual Metaphors in Gichuka Social Discourse: An Ontological Perspective

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Abstract

This study analyses the conceptual metaphors used in Gichuka social discourse with particular focus on ontological metaphors. The purpose of this study is to investigate how language is manipulated by Gichuka speakers through metaphor to achieve varied social goals as well as to shape the social reality. Metaphor determines how people think and how they understand their reality. Therefore, people use metaphor both as a rhetorical tool and as a tool to enhance comprehension. This study is guided by the Conceptual Metaphor Theory (CMT) by Lakoff and Johnson. The study employs purposive sampling of five main Gichuka social activities, which include: a birthday party, a burial ceremony, a religious meeting, menial work activity, and a dowry a negotiation ceremony. It also employs pile sort tasks to group the data for analysis. Metaphor is identified using Metaphor Identification Procedure *Vrije Universiteit* (MIPVU). The study finds Gichuka social discourse to be highly motivated by metaphor. Entities, activities, states and emotions are conceptualized as CONTAINERS, SUBSTANCES and OBJECTS. The

CONTAINER metaphor is found to be the most predominantly used ontological metaphor. Ontological metaphors are also found to perform other functions such as referring, identifying aspects, setting goals and motivating actions, quantifying as well as identifying causes within the social discourse. The most prevalent function of ontological metaphor in Gichuka social discourse is found to be that of referring. This study conventionalizes and invigorates the use of Gichuka social discourse metaphors. It puts Gichuka language in the limelight and the results of this study can be used for cross-culture studies. This study also contributes to the linguistic theory by demonstrating that Gichuka conforms to the Conceptual Metaphor Theory (CMT).

Key Words: *Aspects, Conceptualize, ontological metaphors, Source Domain, Target Domain*

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Effects of Resource Allocation as Per ISO9001:2015 Quality Management System Requirements on Post-Examination Services Delivery in Public Universities in Kenya

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Abstract

The purpose of this study was to assess the effects of resource allocation as pertain to human resource, infrastructure, work environment and organizational knowledge on post examination services delivery. Institutions of higher education adopts ISO9001:2015 quality management system (QMS) to enhance the consistency and amount of resources allocated that would lead to achievement of its quality objectives. Reports of delays in release of examination results, missing marks and poor handling of complaints have arisen despite the presence of laid down processes. The study used a mixed methods research design, targeting 26 universities. From these universities 6 Directors of Quality Assurance, 6 Directors of QMS and PC and Deputy Registrars Academics were selected using purposive sampling. 297 Examination Coordinators and 384 fourth year Students were selected using stratified sampling. Interview schedules were used to collect data from the Directors', Quality Assurance, QMS and PC and Deputy Registrars Academics while semi-structured questionnaires were used to collect data from Examination coordinators and fourth year students. Qualitative data was analysed using content analysis while descriptive and inferential analysis were used for quantitative data. Pearson's correlation analysis was used where $P \leq 0.05$ and 95% confidence interval. The findings indicated a positive and strong correlation in that when the resources were provided as per the ISO 9001:2015 QMS requirements, this resulted in improvement of post-examination services delivery as indicated by ($R=0.749$, $P=0.000$). The regression analysis indicated a positive relationship as shown by the regression coefficient of 0.715 which means that an increase in the level of resource allocation would result to enhanced postexamination services delivery. The study found that, although most of the universities had made efforts in acquiring the relevant knowledge through training, competent staff, infrastructure needed in processing of examination results and maintained suitable work environment, further capacity building was required to enhance service delivery. The study concluded that resource allocation enhanced service consistency and achievement of set quality objectives thus boosting

postexamination services delivery. The study recommends that the government should increase budgetary allocation to universities to enhance post-examination services delivery.

Key Words: *ISO9001:2015, Quality Management System, Resource Allocation, Services Delivery, Post-examination, Public Universities*

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Research Innovation as Transformation tool for Quality Education in Selected Higher Learning Institutions in Mwanza-Tanzania

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Abstract

This study aimed to explore the influence of research innovation as a tool for quality Education. Higher learning education with high provision of research activities would attract finance from different agencies. Research provides opportunities to come up with better policies. Globally, research exploration contributes significant benefits to society. The study posed three objectives to guide the current study: To identify roles of research in higher learning institutions in Mwanza, Tanzania, to determine areas for research innovation in higher learning in Tanzania, to examine possible strategies to curb challenges facing research innovation. Three higher learning institutions in Mwanza city were involved in the study. The research adopted mixed paradigms. A number of 140 respondents were involved in the study. The study adopted cross-sectional survey methods designs, which allow the researcher to visit the field in a single point of time, collect both narrative and quantitative information concurrently analyze separately and merge it at the end of the study. Techniques for data gathering were questionnaires, a descriptive guide, and observation. Instruments were validated, piloted and tested; the result indicated 0.81 Cronbach Alpha demonstrating that tools were acceptable. Information was coded using descriptive statistics with the assistance of the package for Social Sciences (SPSS) Version 21. Narrative data was subjected to word clouds program. Various themes emerged and used in report writing. This study established that; to ensure effective research innovation, university management in Tanzania should guarantee that members of the academic society engage in research discovery. Provision of knowledge should be rooted in research. The government should set a policy that will ensure that research is given paramount priority to all learning institutions. The study recommends that the higher learning managers, government and private sector must invest more in research.

Keywords: *Research, innovation, Transformation, tools for quality*

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Speaking through Silence: A Feminist reading of Chinua Achebe's *Arrow of God* and Elechi Amadi's *The Concubine*

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Abstract

This paper attempts a deconstructive reading of feminism as represented through a symbolic silence of female characters. It analyses Chinua Achebe's *Arrow of God* and Elechi Amadi's *The Concubine* by locating and analysing the silences and actions around female characters. For instance, women in Achebe's novel are relatively silent, resisting attempts to answer back the dominating male figures. With the novel navigating around Ezeulu and other patriarchal figures, the women appear othered, occupying the periphery as either silent observers or puppets of the controlling male. Further, in Amadi's text, the use of magical realism to capture the mystery of the relatively silent Ihuoma reveals the limiting alternatives that the silent/silenced women employ in their quest for space in society. In essence, the paper argues that silence, with its symbolism, is a powerful tool that women can use to fight patriarchal echelons of domination. The authors appear to be using silence to demystify the misconception that women in Africa are less intelligent, weak and subject to manipulation by men. In other words, through silence and other unconventional acts of omission or commission thereof, women have repudiated the general assumption that they are devalued in an African cultural context. Indeed, this article seeks to continue the gender discourse by providing an alternative conceptualisation of African feminism.

Keywords: *African culture, silence, mystery, puppets, other, patriarchy, magical realism, African feminism*

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Of Social Media, a "Renegade" Kenyan Tweep and Conversations on Gender, sex and Sexuality

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Abstract

Social media platforms have become mainstream tools of communication, interaction and networking amongst people in contemporary time. Besides affording us the freedom to broadcast

our opinions, social media has made it possible for a majority of people to more than ever before make comments on socio-economic and political subjects. Much of the information shared on social media is untempered owing to the fact that it stems from individual thoughts, emotions and spur of the moment reactions or responses that may not necessarily be objective. Obtaining from this observation, this article purposes to analyse the selected tweets of an infamous Kenyan Tweep, Eric alias Amerix of the Twitter user handle @Amerix. It seeks to examine the discourse of @Amerix by engaging the theories of hegemonic masculinity and that of feminism. On the one hand, we seek to argue that @Amerix has taken advantage of an existing gender gap to address “men” issues but on the other hand, we also want to demonstrate that it is possible that this undertaking has led to the undermining of gains made towards deconstruction of patriarchal constructs over time. We seek to source for data through purposive sampling by relying on select tweets and the active conversations they have generated in terms of replies, retweets or likes. We will also select those tweets which elicit prominence owing to the hashtag label, #MasculinitySaturday, that has characterised @Amerix’s Saturday sessions leading to some tweeps accusing him of advancing toxic masculinity ideologies. We hope to demonstrate that the social media provides an emerging genre of literary engagement through which both creativity and critical engagement intersect.

Key Words: *social media, toxic masculinity, feminism, patriarchy, deconstruction*

Kwa mtandao wa kijamii, Mkenya “mwasi” katika Twitter na mijadala ya uana, jinsia na ngono

Virginia Wambui Mwathi na Larry Ndivo

Chuo Kikuu cha Machakos

Kitivo cha Sanaa na Sayansi za Kijamii

Idara ya isimu na Lugha

Ikisiri

Mitandao ya kijamii imekuwa ikitumika sana kama vyombo vya mawasiliano na utangamano miongoni mwa watu katika ulimwengu wa sasa. Kando na kutupa uhuru wa kusambaza maoni yetu, mitandao ya kijamii imewezesha watu wengi kutoa maoni yao kuhusu masuala ya kiuchumi-jamii na kisiasa hata kuliko zamani. Habari nyingi zinazosambazwa kwenye mitandao hii hazidhibitiwi kwa vile zinatokana na fikra za kibinafsi, mihemko na makabiliano ama majibu ya papo hapo ambayo inaweza kuwa yenye mapendeleo. Kutokana na haya, makala hii itachanganua jumbe teule za mwanamtandao Mkenya maarufu aitwaye Eric almaarufu Amerix kwenye mtandao wa Twitter akijitambulisha kama @Amerix. Itatathmini kauli zake kwa kuhusisha nadharia za ubabedume na ufeministi. Kwa upande mwingine, tunadai kuwa @Amerix amechukua nafasi hii ya kuwepo kwa pengo la kijinsia linalodumu kushughulikia masuala ya ‘wanaume’ lakini kwa upande mwingine, tungependa kuonyesha kuwa inawezekana kuwa shughuli zake zimedhoofisha maendeleo ambayo yalikuwa yashapatikana katika kuumbua mifumo ya kiubabedume katika mpito wa wakati. Data itakusanywa kwa usampuli wa kimakusudi ambapo jumbe teule zilizopata majibu mengi, zikasambaa sana na hata kupendwa zitatumika. Jumbe zitakazoteuliwa ni zile zenye kuibua umaarufu kutokana na nembo ya *hashtag #MasculinitySaturday* inayotokana na vipindi

vya @Amerix vya Jumamosi na kusababisha wafuasi wake wengine kumtuhumu kama anayeendeleza itikadi za kiubabedume. Tunatumai kuonyesha kuwa mitandao ya kijamii inatoa kipera ibuka cha mahusiano ya kifasihi na kutokana na hayo, kukutana kwa ubunifu na mijadala ya kifasihi.

Istilahi muhimu: *mitandao ya kijamii, 'uume sumu' ufeministi, mfumo wa uume, udenguzi*

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Construction of Gender in Visual Signs in Selected Kenyan Secondary School English Textbooks

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Abstract

Textbooks are a powerful tool for the construction of social identities. Consequently, the manner in which male and female genders are portrayed in visual images in textbooks can greatly affect the images that learners develop of males and females in the society. If we address gender bias in textbook and, it is an avenue towards achieving equality in education: a fundamental goal of both Education for All (EFA) and sustainable Development Goals (SDGs). The National Policy on Gender and Development (NPGAD) was enacted to achieve gender equality. Yet, despite efforts to enact and revise National Policy on Gender and Development (NPGAD) to correct disparities in the visibility, status, and perceived potential of males and females portrayed in textbooks, reviews on textbook suggest that while representation of women has increased and overt sexism has been removed, more subtle issues around gender roles and representations are evident. With the mismatch of the policy and practice and the centrality of gender and textbooks in all aspects, the paper analyses gender representation in selected visuals in Kenyan secondary schools English textbook from a social semiotic perspective. The study applied the explanatory sequential research design. Total sampling, a type of purposive sampling in which the whole population of interest was used to select the textbooks. The target population consisted of four secondary English textbooks used in secondary schools under Secondary Education Quality Improvement Project (SEQIP). Document analysis guide and questionnaires were used to collect data: the textbook visuals where male and female characters are portrayed, were collected, and analysed within the tenets of Kress and van Leeuwen (2006) social semiotics theory. The findings revealed that males' visual images outnumber the females' picture representations in the four textbooks. This then implies that in all the textbooks there is a bias visual gender representation since there are more male represented as compared to female. More males are also portrayed playing the actor role and are involved in more instances in both non-transactional and transactional actional processes, in addition to having more gazes towards the reader than the females. The teachers' affirmed that gender bias was evident in the visuals in the textbooks. The paper concludes that there is gender bias against the females in all the tokens highlighted in the analysis. Certainly, the analysis revealed that visuals implicitly and explicitly represented males as superior to females. The study recommends that gender aspect be considered in the design and selection of visuals to be included

in the English textbooks. KICD, which plays a critical role in the production of textbooks, could initiate a review and revision of the textbooks to ensure gender parity in the visuals.

Keywords: *Social Semiotics, Textbooks, Gender Construction, Gender Bias, SEQIP*

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Effect of Strategic Direction on Service Quality of Accredited Universities in Kenya

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Abstract

The sharp increase in the number of universities in Kenya in recent years, as well as the emergence of global higher education rankings, have subsequently led to competition in universities, and this has raised concerns about quality issues. This has accelerated societal and public- sector pressure on universities to be more accountable and to exemplify quality and effectiveness in their management. University stakeholders have increasingly demand for quality services from these institutions. The problem however is that they have been unable to provide quality services outcomes. This is a gap that prompted the start of this study to determine the effect of strategic direction on service quality of accredited universities in Kenya at the 74 accredited universities as at February 2022. The objective of this study was to determine the effect of strategic direction on service quality of accredited universities in Kenya. This quantitative study utilized both cross-sectional and explanatory research design. Census survey was used as the sampling design to select 74 public and private accredited universities in Kenya. Questionnaires were administered to 74 deputy vice chancellors in academic and research, 74 vice chancellors administration in administration and 74 finance officers. Pilot testing was done to determine the validity of the research instrument, and Cronbach alpha was used to determine the research instrument's reliability. In this study, inferential and descriptive analysis were used. The descriptive analysis revealed that university leaders indicated a high level of agreement on strategic direction. The hypothesis testing results showed that strategic direction has a positive and statistically significant relationship with service quality of accredited universities in Kenya. The study concluded that strategic direction has a significant effect on improving the quality of services in Kenyan accredited universities. Strategic direction had significant positive effect on service quality. These findings imply that strategic leaders should place more emphasis on determining strategic direction in order to improve the service quality of Kenya's accredited universities. Strategic leadership in accredited Kenyan universities should embrace strategic direction development aspects that have a strong predictive influence on service quality as well as putting strategic in place, in the institution, since these are important strategic direction tools to facilitate service quality in Kenyan universities.

Keywords: *Strategic direction, Service Quality, Strategic leadership, Accredited Universities.*

**SUB-THEME 5 - IMPLICATIONS OF INNOVATIVE RESEARCH AND INNOVATION
CULTURE AND LANGUAGE EDUCATION IN A DISRUPTIVE WORLD**

Design Thinking in the Age of Disruption: the Afrikan context...

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Abstract

This paper presents an Afrikan perspective on the increasingly popular Design Thinking methodology in the age of technological innovation and disruption. At its core, Design Thinking is a practical application of nuanced and context-responsive Human-Centred Design strategies that are deployed in a participatory design context to aid in problem-solving and result in innovative solutions. Within the context of Afrika, Design Thinking is a relatively new approach that is gaining traction as more design practitioners and participating actors realise the efficacy of such a progressive ethos. Whereas the value of Design Thinking is well received within homogenised corporate team settings (particularly in the West), applying the methods and toolkits in financially constrained communities and settings poses unique challenges that demand interrogation, empathy and a deeper understanding.

Keywords: *Afrika; Co-Design; Design Thinking; Human-Centred Design; Participatory Design; Ubuntu*

Talent Management and Institutional Performance

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Abstract

Global war for talent is aimed at attracting and retaining the best employees that will turn organizations to make profits, cut the costs of operations, motivate staff and remain competitive in the market. The paper examined the role of talent management on organizational performance. The methodology used was to review the online papers already published. The findings reveal that indeed talent management has contributed to invested in employees with capabilities to propel the company to defeat the competitors. The study recommended talent management strategies to be instituted in all institutions for institutions to remain competitive.

Key words: *talent management, institutional performance, succession planning, Human resource development*

Influence of cultural Activities on Primary Education in Tanzania

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Abstract:

Education is an important aspect in liberating people, thus education is a powerful tool in enhancing the change to an individual. The process of transferring knowledge and skills from one generation to another influenced by the cultural activities practiced in the society. Cultural activities are the activities practiced in the society to ensure the persistence of the societal culture. The reflection focused on identifying cultural activities practiced in different societies, how the cultural activities influence the provision of education to the children and lastly focused on how cultural activities lead to the students drop out in schools. The review of the literature was based on the mentioned objectives and the study revealed that there are different cultural activities practiced within the nation depending on the nature of the society those activities including; Female Genital Mutilation (FGM), early marriage, forced marriage, drawing, and traditional dances. Also, the study established that cultural practises influence the provision of education in different ways depending on the whether the cultural activity is perceived positively or negatively by the society. Moreover, the study exposed that most of the cultural activities practiced in the society have led to the students drop out in schools as they keep children busy concentrating on the cultural practice and forget about school. The study conclude that the cultural activities impact both negative and positive the provision of education and led to the students drop out in schools. Based on this conclusion, the study recommended that the government should prohibit the cultural activities which impact negative the provision of education and led to the students drop out.

Keyword: *Education, Culture, Cultural activities, Society*

The Transition from 8-4-4 to 2-6-6-3 (Competence Based Curriculum) system of education in Kenya: A Case of Public and Private Universities

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Abstract

The Competency Based Curriculum (CBC) under the 2-6-6-3 system of education is a current paradigm shift in the Kenyan Education sector. The CBC curriculum, which a total overhaul of the existing education system (8-4-4) was introduced in 2017. The KICD, as mandated by the Basic Education Act of 2013, has effectively and successfully spearheaded the preparation of the CBC and rolled it out up to grade six (6). On the other hand, universities are mandated to prepare the university curriculum (The University Act, 2012). According to the Basic Education

Curriculum Framework, the first cohort of CBC students is expected to join universities in 2029. However, there is little evidence of what measures /strategies universities have mounted in preparation for the transition at the higher education level. The purpose of this study was therefore to investigate the status of universities' preparedness in transiting from 8-4-4 to 2-6-6-3 system of education. It was guided by two research objectives, that is, to examine the initiatives universities have put in place in preparation for the CBC reform and to establish whether universities have aligned their curriculum to CBC. A descriptive survey research design was adopted for this study. It was carried out in six universities in Nairobi Metropolitan Zone. The sample of the study was: 6 university Directors of Quality Assurance, 12 Deans, 36 Chairmen of Departments and 120 lecturers yielding a total of 174 respondents. The findings of the study revealed that universities have mounted a few activities on transiting from 8-4-4 to 2-6-6-3 system of education (development of CBC steering committees, bench marking with other universities and capacity building of academic staff). The study also showed majority (89.5%) of university lecturers are not acquainted with the CBC philosophy. The study further revealed almost all universities are yet to align their academic programmes to CBC. It was therefore concluded that universities are ill prepared for the CBC reform. The study recommends that the Universities should urgently put measures in place to align their academic programmes to CBC.

Key words: *Academic Programmes, Competency Based Curriculum, Curriculum implementation, reform and transition.*

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Empowerment of Self-help Groups of People Living with HIV/AIDS in Kisii County: Lessons from research and practice

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Abstract

To address factors for the spread of HIV/AIDS, people living with the condition in Kisii County are forming or joining self-help groups or CBOs. Activities of the organized groups include banana farming, livestock rearing, fish farming, table banking and merry-go-round. The groups also engage in community sensitization on HIV/AIDS management. These activities have improved adherence to HIV/AIDS treatment, nutrition, treatment outcomes and financial sustainability. Despite the noble role and activities of the groups, there is no policy framework regulating them. This papers discusses the considerations for the formation of the groups, their success stories and challenges, In order to mainstream these groups into social support frameworks in the community and enhance their outputs, the Ministry of Culture, Youth, Gender, and Social Services needs to develop and implement necessary policies.

Key words: *Policy context, self-help groups, community-based organisations, table banking.*