KIRINYAGA UNIVERSITY
6TH ANNUAL INTERNATIONAL CONFERENCE, 2023
MARCH 22ND – 23RD, 2023

PROGRAMME AND BOOK OF ABSTRACTS

THEME
RESEARCH, INNOVATION & TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT

SUB THEMES
- **Demystifying Economic Models for Sectoral Transformation**
- **Strategic Approaches to Global Enterprise Management**
- **Role of Educational Technology in Behavior Change**
- **Rethinking Educational Reforms**
- **Science, Technology & Mathematical Modelling for Development**
- **Engineering, Technology & Design for Development**
- **Forensic Science & Social Responsibility**
- **Interdisciplinary Approaches to Public Health Management**

VENUE:
VIRTUAL PLATFORM OF KIRINYAGA UNIVERSITY

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KIRINYAGA UNIVERSITY

6TH ANNUAL INTERNATIONALCONFERENCE, 2023

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Editors

Prof.Charles, O. A. Omwandho, Ph.D

Dr. Grace W. Kiiru, Ph.D

Dr. Paul N. Waithaka, Ph.D

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8.00 - 8.30am   Preliminaries – Simon Gacheru / Anjela Alwora
- Conference Registration
- Familiarization with the Conference Programme

8:00am - 4.30pm: Conference Opening / Plenary/ Parallel Sessions

<p style="text-align:center; color:green;">**Dr. Grace Kiiru-Conference Chair**</p>

Coordinator: Dr. Paul Njenga
Rapporteur: Zipporah Ndirangu

DAY ONE PROGRAMME

TIME	ACTIVITY
8:30 am - 8: 35 am	**Welcoming Remarks**- Deputy Vice Chancellor (ASA), Kirinyaga University - **Prof. Charles, O. A. Omwandho, Ph.D**
8: 35 am – 8.45am	**Opening Remarks/Introduction of Keynote Speaker -** VC, Kirinyaga University - **Prof. Mary Ndung'u, Ph.D**
8.45 am-9.45a.m	**Keynote Speaker – Prof. Jackie, K. Obey** **Conference Focus**-' *Research, Innovation and Technology in Managing Forensic Science, Public Health and Social Responsibility'*
9.45 am-9.55am	**Transition Break/ Introduction of Keynote Speaker - VC**
9.55 am-10.55a.m	**Keynote Speaker- Prof. Bitange Ndemo** **Conference Focus**-'*Research Collaborations for Africa's Economic Transformation'*
10.55 am-11.25am	Tea/Health Break
11.25 am-11.30am	Transition to the Parallel Venues
11.30 am - 1.00pm	Parallel Sessions & Plenary
1.00 pm - 2.00pm	Lunch/Health Break
2.00 pm – 4.30pm	Parallel Sessions & Plenary
4.30pm	Announcements/Closing/ Tea

MID-MORNING PARALLEL SESSIONS…………………11.30AM – 1.00PM

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION - PANEL A
Chair	Dr. Daniel Mungai
Rapporteur	Catherine Maina

1. **Ledama, S., Wanyoike, B. & Githira, C.** (KCA University). Financial Structure and Financial Intermediation Efficiency of Deposit Taking, Saving and Credit Cooperative Societies in Kenya

2. **Kiiru, G. W.** (Kirinyaga University). Desktop Review on Business Recovery Strategies Post-Covid

3. **Muriithi, K. & Waweru, G.** (Kirinyaga University). Impact of HIV/AIDS Expenditure on Prevalence Outcomes

4. **Mwangi, P. W. & Mutiso, A.** (Kirinyaga University). Internet Banking and Sustainability of Registered Commercial Banks in Kenya

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION - PANEL B
Chair	Dr. Stephen Kamau
Rapporteur	Gabriel Waweru

1. **Maina, M. W. & Kamau, J. M.** (Kirinyaga University). Effect of Business Risks on Interest Rate Spread of Commercial Banks in Kenya

2. **Muchangi, D. J. & Sisenda, W. O.** (Kirinyaga University). Teaching Staff Recruitment in Technical Vocational and Educational Training Centres in Kenya

3. **Barine, N. H., Kariuki, S. N., Kariuki., P. W.** (University of Embu, Kenya). Asset Structure, Leverage, and the Value of Listed Firms: Evidence from Kenya.

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS-PANEL A
Chair	Dr. Benard Chemwei
Rapporteur	Dr. Susan Nkanata

1. **Kerubo, J. & Muiru, A. W.** (Kirinyaga University) Implementation of Competence Based Curriculum (CBC) in Kenyan Universities: Challenges and Opportunities

2. **Muriuki, J. N. & Gakunga, D (**University of Nairobi**).** Challenges Facing Grade Six Pioneer Competence Based Curriculum Class as they Transit to Junior Secondary School: A Case Study of Nakuru North Subcounty, Kenya

3. **Kipkenei, S. K[1]. & Cherui, R. G[2].** (Kibabii University[1], Daystar University[2]). Primary Teacher Education and Kenya's Vision 2030: - The Lacuna in the Transformation Agenda

4. **Ratanya, S. (**Technical University of Mombasa**).** A Meta-Model of E-Collaboration in Classroom Organization and CBC Learners Performance in Public Primary Schools in Kilifi County

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS - PANEL B
Chair	Dr. Safari Ntalala
Rapporteur	Annastacia Mbisi

1. **Lagat, D**. (Kirinyaga University). Role of Education Technology in Inculcating Environmental Management Behaviour and Morals: The Case of Kirinyaga County, Kenya

2. **Mungai, S. N., Mwirichia, S. & Gichohi, P.** (Kenya Methodist University). Influence of Principal's Innovation on Financial Management in Secondary Schools in Meru County, Kenya

3. **Murithi, N. M., Ongeti, K. & Kisilu, S. A**. (Moi University). Extending Technology Adoption Model to Explain Use of Blended Learning in Public Universities in Kenya. A Case of University of Eldoret

4. **Nderitu, N. (**Kirinyaga University). Role of Educational Technology in Behaviour Change Among Students in Private Universities in Kiambu County, Kenya

SUB-THEME	ENGINEERING, TECHNOLOGY AND DESIGN
Chair	Dr. Kennedy Malanga
Rapporteur	Catherine Mukunga

1. **Maringa M.,** (Central University of Technology, Free State, South Africa). Theoretical Testing for Dispersion in Transversely and longitudinally Vibrating Beams of Short, Randomly Oriented Glass Fibre Reinforced Dough and Sheet Moulding Compounds

2. **Ishmael, N. A[1]., Ogara, S[2]. & Raburu., G[3].** (Catholic University of Eastern Africa[1], JOOUST[23]). Energy Efficient Buildings for Biosphere's Sustainability

3. **Njeru, D. M[1]. & Mwachugha, A. G[2].** (Kirinyaga University[1], DeKuT[2]). Extraction and Analysis of Phenolic Compounds in Coffee Cherry Pulp and their Utilization in Production of Resinoid Bond for a Brasive Machining Wheels

4. **Wainaina, P. M., Njue, R. & Owino, G.** (Egerton University). Solar Radiation Models for Predicting and Maximum Capacity of Solar Milk Cooling Refrigeration System for in a Site

5. **Maringa M.[1] Du Preez W. B.[1] & Muiruri A. M.[2]** ([1]Central University of Technology, Free State, South Africa, [2]South Eastern University, Kenya). Cases of and the Effects of Different Strain Rates on the Deformation-Behaviour and Microstructure of Ti6Al4V and other Metallics.

SUB- THEME	HEALTH MANAGEMENT AND SOCIAL RESPONSIBILITY
Chair	Dr. Mark Webale
Rapporteur	Anjela alwora

1. **Ngari, C. W[1]., Gitonga, C. N[2]., Murwayi, L. A[3]. & Okongo, M[4]**. (Chuka University[134], Kirinyaga University[2]). Optimal Control of Cholera Incorporating the Dynamics of the Induced Achlorhydria Condition with Cost Effect Strategies

2. **Nderu, D.** (Kirinyaga University). Molecular Epidemiology of Norovirus in Kenya

3. **Mbisi, A[1]., Githae, C. N[2]. & Boraya, J. O[3].** (Chuka University[1], Kenyatta University[23]). Utilization of Partograph in the Management of Women in Labor among Nurses Working in Embu County, Kenya

4. **Kamau, S. (**Kirinyaga University). A Scoping Review: Identifying the Roles of the Nurse Clinical Instructor in Middle Income Countries

SUB – THEME	SCIENCE, ICT & MATHEMATICAL MODELLING
Chair	Dr. Joseph Esekon
Rapporteur	Dr. Agatha Wagutu

1. **Leiririo, J. L. Karuri,. H. & Nyaga, J. M.** (University of Embu). Variation in Soil Nematode Communities in Mung Bean Cropping Systems

2. **Waithaka, P. N.** (Kirinyaga University). Effect of Cultural Conditions and Physical Factors on Production of Antibiotic Metabolites by Selected Actinomycetes

3. **Kagendo, J. (**Kirinyaga University). Effects of Leasehold on Community Forest Association Benefits in Dryland Resources Management: A Case Study of Kibwezi Forest in Kenya

4. **Kuria, M. (**Kabarak University**).** Review on Variation in Genetic and Chemical Constituents of Strychnos Henningsii Populations in Kenya

5. **Waithaka, P. N.** (Kirinyaga University). Determination of *Invintro* Lethality of Actinomycetes Antibiotic Extracts from Menengai Crater Geothermal Vents, Kenya

6. **Kagendo, J. (**Kirinyaga University). Effects of Fresh Water Degradation on Human Activities: A Case of Athi River, Machakos County, Kenya

7. **Ndenga, M. K.** (Kirinyaga University). A Deep Decision Forests Model for Hate Speech Detection**.**

8. **Mugambi., N**. (Jomo Kenyatta University of Agriculture and Technology, KENYA). MyKura Remote Election Management and Voting System

AFTERNOON PARALLEL SESSIONS   2.00PM – 4.30PM

SUB-THEME	**BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION- PANEL A**
Chair	**Dr. David Kabata**
Rapporteur	**Grace Chomba**

1. **Wambugu, H., Maina, E. & Ndung'u, P.** (Kirinyaga University). Strategic Marketing Approaches and Market Penetration by General Insurance Companies in Kenya

2. **Kamau, S.** (Kirinyaga University). Project Management Practices in School Construction Projects

3. **Gachoki. J. M., Kinyua. J. M. & Kariuki. S.N.** (University of Embu). Environmental Munificence and Performance of Insurance Companies in Kenya

4. **Mungai, D. K[1]., Maina, M. W[2]. & Kungu, J. N[3].** (Kirinyaga University[1,2], Laikipia University[3]). Effect of Internal Control Systems on Financial Performance of Public Universities in Kenya

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION- PANEL B
Chair	Dr. Gideon Mwangi
Rapporteur	Kenneth Muriithi

1. **Alani, J.** (Gulu University, Uganda). Two Economic Laws of Household Consumption Function: A Case of Kenya

2. **Machariah, D., & Kiplangat, D. C** (DeKuT, Kenya). Customer Default Prediction in Lipa Pole Pole Model in Kenyan Business Enterprise

3. **Muigai, R. G[1]. & Muriithi, J. G[2].** (Kirinyaga University[1], Africa International University[2]). Credit Prudential Guidelines and Loan Performance of Microfinance Banks in Kenya

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL A
Chair	Dr. Jane Kagendo
Rapporteur	Cecilia Irungu

1. **Muiru, A. W.** (Kirinyaga University). A Critical Analysis of 21[st]century Students Learning Outcomes for Educational Reforms in Kenyan Universities

2. **Motanya, J. O.** (Karatina University). Rethinking the Efficacy of Higher Education Reforms Towards Enhancing Quality and Access in Kenya

3. **Ngunjiri, N.** (University of Nairobi). Enhancing the Contribution of Higher Education in Fourth Industrial Revolution

4. **Lagat, D.** (Kirinyaga University). Using Indigenous Knowledge and Education to Influence and Shape Nationally Determined Contributions Implementation in the Forest and Land-Use Sector Near Mount Kenya Forest

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL B
Chair	Dr. Nene Nderitu
Rapporteur	Doreen Mbae

1. **Muusya, J. K.** (Kirinyaga University). Lugha Na Uvumbuzi Wakisayansi na Kiteknolojia

2. **Thiaka, E. M.** (Mount Kenya University). A Cognitive Analysis of Woman Metaphors in Kikuyu Secular Songs

3. **Ntalala, G. S.** (Kirinyaga University). Strategies of Persuasion in Deliberative Discourse: An Analysis of Kenyan Parliamentary Committee Reports

4. **Barasa, V.** (Kirinyaga University). Reconfiguring Gender and Cultural Practices for Sustainable Development in 21st Century: An Analysis of Ole Kulet's Blossoms of the Savannah

SUB-THEME	ENGINEERING, TECHNOLOGY AND DESIGN
Chair	Dr. Emmanuel Mbusi
Rapporteur	Moses Mwai

1. **Karanja, J. M[1]., Zhou, X[2]. & Dai, Y[3].** (Kirinyaga University[1], Wuhan University of Technology, Wuhan China[2,3]). Π Phase-Shift Fabrication of Fiber Bragg Grating by Post-Processing Using Femtosecond Laser

2. **Kinyua, D. M[1]. & Njoroge, S. M[2].** (Kirinyaga University[1], Karatina University[2]). The Potential of Cellophane Sheet as a Cheap Optical Retarder

3. **Karanja, J. M[1]., Zhou, X[2]. & Dai, Y[3].** (Kirinyaga University[1], Wuhan University of Technology, Wuhan China[2,3]). Research on Ultrasonic Vibration Aided Femtosecond Laser Machining Process of Transparent Materials

4. **Kinyua, D. M[1]., & Njoroge, S. M[2].** (Kirinyaga University[1], Karatina University[2]). Polarization Effect in Phase Holograms

5. **Moloi, T. D.[1], Dzogbewu, T. C.[1], Maringa M.[1] & Muiruri A. M.[2]** (Central University of Technology, Free State, South Africa[1], South Eastern University, Kenya[2]). The Effect of Soaking Temperature on the Microstructures of

Additively Manufactured Stress Relieved, as Well as Stress Relieved and High Temperature Annealed Ti6Al4V(ELI).

SUB- THEME	HEALTH MANAGEMENT AND SOCIAL RESPONSIBILITY
Chair	Dr. Elly Munde
Rapporteur	Kenny Kimani

1. **Njau, S. K.** (Kirinyaga University). Practices by Nurses to Prevent Pressure Injuries at a Level 5 Hospital in Kenya

2. **Amukuzi, M. K.** (Moi University). Mechanisms for Public Participation in Health Communication Campaigns: Case of the Universal Health Coverage in Kenya

3. **Marwa I.N., & Okello E.A. (**Kirinyaga University). Injury Patterns and Mortality Rate of Motorcycle Related Injuries in Kerugoya Town, Kirinyaga County

4. **Odira., M.O.** (Kirinyaga University, Kenya). Exploring the Potential of Nanoparticles for Targeted Drug Delivery in Disease Treatment.

SUB – THEME	SCIENCE, ICT & MATHEMATICAL MODELLING
Chair	Dr. Zachary Kayiita
Rapporteur	Dr. Esther Maina

1. **Mwikya, J. & Karani, J.** (Kirinyaga University). Web Services Sharing among Business Enterprises

2. **Oyaro, A. O.** (JOOUST). Arnold's Factorization Algorithm for Semi-Primes and the Crypt-Analysis of RSA Cryptography

3. **Wasike, J. M.** (Kirinyaga University). Knowledge Management Systems as a Catalyst for Societal Empowerment: A Kenyan Perceptive

4. **Mageto, V.** (Kirinyaga University). Macro Facial Expression Recognition and Analysis Using Supervised 2D-PCA and Linear SVM

5. **Musyoka, C. & Wanjohi, P. (**Kirinyaga University). Big Data Analytics for the Sustainability of SMES' Performance in Kenya after Covid-19.

6. **Ehoda, E.[1], Adebayo, O.S.[2], Idris, I.[3], Ojeniyi J. A.[4], Olalere, M[5].** ([1234]Cyber Security Science Department, Federal University of Technology, Nigeria**,** [5]Islamic

University, Uganda). Systematic Literature Review on Application Program Interface-Based Android Malware Detection.

7. **Ireri, C[1]. & Muchangi, D. J[2].** (University of Nairobi[1], Kirinyaga University[2]). Bivariate Based Susceptibility Mapping for Gully Erosion in Wanjoga River Catchment Upper Tana Basin, Kenya

8.00 – 8.30 am   Preliminaries – Simon Gacheru /Richard Ndung'u
↓ Conference Registration
↓ Familiarization with conference programme/ Announcements

8:00am - 4.30pm: Conference Opening / Plenary/ Parallel Sessions/Closing

Coordinator: **Prof. Jane Kerubo**
Rapporteur: **Dr. Dickson Kinyua**

DAY TWO PROGRAMME

TIME	ACTIVITY
8:30 am - 8: 35 am	**Welcoming Presenters – Prof. Jane Kerubo**
8:35 am–11.00 am	Parallel Sessions & Plenary
11.00 am-11.30 am	Tea/Health Break
11.30 am-11.35 am	**Remarks** - Deputy Vice Chancellor (ASA), Kirinyaga University **Prof. Charles, O. A. Omwandho, Ph.D**
11.35 am-11.45 am	**Remarks/Introduction of Keynote Speaker -** VC, Kirinyaga University - **Prof. Mary Ndung'u, Ph.D**
11.45 am-12.45 pm	Keynote Speaker- **Prof. Martin Oliver** **Conference Focus**-' *Emerging Role of Education Technology for Reforms and Behaviour Change*'
12.45 pm -1.45 pm	Lunch/Health Break
1.45 pm-1.55 pm	Transition to the Parallel Venues
1.55 pm – 3.55 pm	Parallel Sessions & Plenary
3.55 pm - 4.05pm	Closing Remarks from Deputy Vice Chancellor, Kirinyaga University - **Prof. Charles O. Omwandho, Ph.D**
4.05pm - 4.15pm	Closing Remarks Vice Chancellor, Kirinyaga University, **Prof. Mary W. Ndung'u, PhD**
4.15pm - 4.20pm	Announcements /Issuance of Certificates
4.20pm - 4.25pm	Vote of thanks by Representative of Participants
4.25pm - 4.30pm	Vote of thanks from Conference Chairperson **Dr. Grace Kiiru**
4.30 pm	End of the Conference

MORNING PARALLEL SESSIONS……………………………...8.35 AM - 11.00AM

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION- PANEL A
Chair	Prof. Pius Odunga
Rapporteur	Dr. Mary Maina

1. **Chibole, K. W.** (Masinde Muliro University of Science and Technology). Influence of Asset Quality On Financial Performance of Commercial Banks in Kenya

2. **Mwangi, G. M. & Muigai, R. G.** (Kirinyaga University). Effect of Custom Duty Incentives on Financial Performance of Manufacturing Companies in Kenya

3. **Kamau, G. K. Kamau G.K.[1]**, **Kariuki, S, N.[2], Njagi, Z.N.[3] & Ndung'u, B.W.[4]** (University of Embu, Kenya Agricultural and Livestock Research Organization). Effect of Contract Farming on Market Access among Tomato Farmers in Kajiado County, Kenya

4. **Kinuthia, L. N.** (Kirinyaga University). Role of Entrepreneurial (EO) in Marketing Strategy Implementation by Garment Making Micro Enterprises in Nakuru, Kenya

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION- PANEL B
Chair	Dr. Robert Gitau
Rapporteur	Patrick Mwangi

1. **Kinyua, J. W., Kiiru, G. W. & Njoroge, D.** (Kirinyaga University). Loan Monitoring Strategies and Loan Repayment Performance of Revolving Funds in Kenya

2. **Biwott, G.** (Bomet University). Green Entrepreneurship as a Panacea for Financial Sustainability of Businesses in Kenya Today

3. **Kibui, M. N.** (Dedan Kimathi University of Technology). Effect of Technology–Organization–Environment Framework and Entrepreneur Practice in Kenyan Public Universities

4. **Tarus, T. K.** (University of Kigali, Rwanda). Effect of Financial Investment on Sustainability of Non-Government Organizations Beyond Donor Funding in Nairobi County

5. **Maina, C. W. (**Kirinyaga University, Kenya). Influence of Group Dynamics on the Growth of YEDF- Funded Youth Group Based Enterprises in Nairobi County, Kenya

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL A
Chair	Dr. Anne Muiru
Rapporteur	Mr. David Njeru

1. **Naibei, M.** (Kirinyaga University). Rethinking Educational Reforms: An Instructional Language Reform Approach

2. **Chemwei, B.** (Kirinyaga University). Moral Education in Kenyan Schools at Cross Roads. Isn't it Time to Introduce a Stand-alone Moral Education Curriculum?

3. **Vundi, N.** (St. Paul's University). Improvement of the Quality of Doctoral Programmes for the Production of Better Thinkers and Problem Solvers for Tomorrow in Kenya

4. **Okpo, J.** (University of Aberdeen, UK). Learner Personality Considerations in Learning Analytics: A Proposal

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL B
Chair	Dr. Justus Muusya
Rapporteur	Shelley Mangami

1. **Nyongesa, S. N.** (Kirinyaga University). Using Educational Technology in Teaching and Learning in Universities in Kenya: Is it a Blessing or a Curse.

2. **Kariuki, P. W.** (Nyandarua National Polytechnic). Integration of Gender Equality Best Practices in TVET Institutions: A Case Study of Nyandarua National Polytechnic, Kenya

3. **Moywaywa, K. C.** (South Eastern Kenya University). The Ideatic Theory of Religion: Formulating a New Theory for Religion

4. **Otiso, W. N.** (Chuka University). Science Technology and Innovation for Sustainable Development in Kenya: Implementation of Legal and Policy Mechanisms

5. **Amadi, O. J.** (Maasai Mara University). Psycho-Social Support to Children Infested by Jigger in Kisii County: Social Work Perspective

SUB-THEME	ENGINEERING, TECHNOLOGY AND DESIGN
Chair	Eng. Rodgers Bosire
Rapporteur	Nelson Muchira

1. **Macharia, I. M.** (Kirinyaga University). Using Gravity, Magnetic Force, Wind and Internally Generated electricity to Make a Moving Machine

2. **Wafula, M.** (United States International University Africa). Finite Difference Analysis of Boundary Layer Flow of Nanofluids Past a Vertical Plane with Heat Transfer

3. **Kiwiri, F. W.** (Kirinyaga University). Determining the Landfill Gas Potential for Electricity Generation in Kerugoya Kutus Municipality

4. **Ng'eno, V[1]. & Juma, S[2].** (Kirinyaga University[1], EWACO, Nairobi[2]). Assessment and Mapping of Natural Resources and Land Use Within Nairobi River and Mbagathi Sub-Basin

5. **Odhiambo, S., Mwasi, B. N., Ngetich, J. K. (**University of Eldoret). Capability of Rule Based Classification Technique in Identifying Sprawl Areas: A Case Study of Areas Around Eldoret Town, Kenya

SUB- THEME	HEALTH MANAGEMENT AND SOCIAL RESPONSIBILITY
Chair	Dr. Janerose Muriuki
Rapporteur	Geoffrey Obondi

1. **Kuleanya, S[1]., Kilongosi, M[2]., Munyekenye, G[3]., Bowen, N[4]. & Kagoiyo, S[5].** (Maseno University1, Kirinyaga University[235], Ministry of Health[4]). Molecular Characterization of Full-Length HIV-1 Envelope-Gene in Antiretroviral Treatment Injection Substance Users in Nairobi, Kenya

2. **Gichobi, B.** (Chuka University). Effect of Anti-Hypertension Therapy Adherence on Blood Pressure Control Among Outpatients at Kerugoya Referral Hospital

3. **Ngunyi, H.[1], Irungu, C.[2]** ([1]Kirinyaga University, Kenya, [2]Daystar University, Kenya). An Assessment of Social Media Use on Mental Health of University Students.

SUB – THEME	SCIENCE, ICT & MATHEMATICAL MODELLING
Chair	Dr. James Reuben Mwikya
Rapporteur	Dr. Victor Mageto

1. **Kamotho, C[1], Ngure, J[2]. & Kinyua., M[3].** (Kirinyaga University[12], Karatina University[3]). Modelling of Daily Covid-19 Cases in Kenya Using a SARIMA Model

2. **Kagendo, J. (**Kirinyaga University). An Investigation on Declining Water Levels of River Mutonga in Tharaka Nithi County, Kenya

3. **Shee, A[1]. Oyugi, C[2]. & Ohowa, B[3].** (Technical University of Kenya[1], Kenya Petroleum Refineries Limited[2], Kenya Marine and Fisheries Research Institute[3]). Heavy Metals in Refinery Wastewater: Assessment and Treatment Using Diatomaceous Earth

4. **Kagendo, J. (**Kirinyaga University). Influence of Community Forest Association Activities on Dryland Resources Management: A Case of Kibwezi Forest in Kenya

5. **Kibaara, S. & Karweru, M.** (Technical University of Mombasa). Developing a Techno-Economic Modeling Tool for Small Scale Utility Solar PV Technology for Quantifying Environmental Impacts

6. **Onuja, A. M.[1], Adebayo, O. S[2], Olalere, M.[3], Aliyu, H. O.[4]** ([1,2,3]Federal University of Technology, Minna, Nigeria. [4]Federal University of Technology, Minna, Nigeria. [2]Islamic University, Uganda, [1]Confluence University of Science and Technology, Nigeria). Cloud Data Security Audit Report Techniques Using Bat Inspired Algorithm (CDSART-BA): A Review.

AFTERNON PARALLEL SESSIONS   1.55 PM – 3.55 PM

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION - PANEL A
Chair	Dr. Mark Waita
Rapporteur	Jackson Maina

1. **Editah. N.K.** (Kenyatta University). Influence of Employees Training on Organizational Performance of Commercial Banks in Kenya

2. **Nkanata, S. N.** (Kirinyaga University). Work Life Balance and Employee Retention in Public Level Five Hospitals in Kenya

3. **Odunga, P. O.** (Kirinyaga University). Impact of Tourism on the Economy of Rwanda: Social Accounting Matrix (SAM) Analysis

4. **Osiako, P. O**. & Szente, V. (Hungarian University of Agriculture and Life Sciences, Hungary). Mediatory Effect of Perceived Behavioral Control on the Relationship Between Visitor Intentions and Behaviour in Domestic Heritage Tourism

SUB-THEME	BUSINESS MANAGEMENT AND ECONOMIC TRANSFORMATION - PANEL B
Chair	Dr. Denis Muchangi
Rapporteur	Michael Gachichio

1. **Orangi, A. K[1]., Dr. Ombui[2]** (Kirinyaga University, Kenya). Determinants of Social Class as Demographic Segmentation Practices on Consumer Choice of Ready to Wear Clothes in Kenya

2. **Ndirangu, Z., Njoroge, D., & Kamau, S.** (Kirinyaga University) Effect of Collective Bargaining Agreement on Employee Retention among Medical Practitioners in County Governments in Kenya: A Case Study of Kirinyaga County

3. **Muriuki, N. M., Rintari, N. & Muema, W.** (KeMU). Effect of Digital Marketing Strategies on the Sales Growth of Coffee Export in Kenya

4. **Kevin, O. & Akoth, J. O. (**Masinde Muliro University of Science and Technology). Supplier Evaluation Management Practice and Supply Chain Performance of Kenyan Selected County Governments of Nyanza Region

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL A
Chair	Dr. Violet Barasa
Rapporteur	Dr. Sophia Njeru

1. **Chemwei, B[1]. & Changwony, R[2]. (**Kirinyaga University[1], Kapropita Girls High School[2]). Influence of Instructional Methods on Girls' Performance in KCSE Mathematics in Baringo Central Sub County, Kenya

2. **Okello, L. M & Omollo, T. M.** (Rongo University). The Level of Students' Self-Efficacy on E- Learning at Post-COVID-19 Pandemic: Case Study of Rongo University-Kenya

3. **Giochi, K. G. (**University of Embu). Drug and Substance Abuse Management Approaches and Academic Performance in Secondary School Students in Embu and Tharaka Nithi Counties, Kenya

4. **Kerubo, J. & Kimani, A.** (Kirinyaga University). Effect of Technology on Student's Behaviour in Universities in Kenya

SUB-THEME	EDUCATIONAL TECHNOLOGY AND REFORMS- PANEL B
Chair	Dr. Daniel Lagat
Rapporteur	Antony Kinyanjui

1. **Balogun, O.** (Redeemers University, Nigeria). Prospects of Online and Mobile Learning Methods as Viable Educational Reforms and Sustainable Development
2. **Nyamundundu, A. V. (**Gacuba II TTC, Rwanda). Investigating the Role of Educational Technology in Behaviour Change
3. **Kerubo., J.[1], Oliver., M.[2] (**[1]Kirinyaga University, Kenya, [2]IOE, UCL's Faculty of Education and Society, UK). Academic Integrity in Kenya Universities: Using the Prisoner's Dilemma to Develop Positive Interventions.

SUB-THEME	ENGINEERING TECHNOLOGY AND DESIGN
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1. **Bosire, N. R[1]., Nyakundi, A[2]. & Golovin., I[3].** (Kirinyaga University[12], National University of Science and Technology, Nust-Misis, Moscow[3]). Composition, Application and Heat Treatment of Dual Phase Steels
2. **Mbusi, E. T.** (Kirinyaga University). Construction Industry Output and Central Bank of Kenya's Base Lending Interest Rate (2007 – 2022)
3. **Kimemia, M[1]. & Oigo, B[2].** (Kirinyaga University[1], Kenyatta University[2]). Socio-Demographic factors of Fashion Purchase: A Case of Apparel Consumption among Kenyan University Students
4. **Chomba, W., Bichage, G. & Kariuki, A.** (Karatina University). Influence of Energy Conservation Practices on Customer Satisfaction in Star Rated Hotels in Mt. Kenya Region, Kenya

5. **Odhiambo, S., Mwasi, B. N., Ngetich, J. K.** (University of Eldoret). Predicting Urban Sprawl Patterns Using Integrated Markov Chain, Cellular Automata and Analytical Hierarchy Process Models Around Eldoret Town, Kenya

SUB- THEME	HEALTH MANAGEMENT AND SOCIAL RESPONSIBILITY
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Rapporteur	Richard Ndung'u

1. **Kiraki, M. Gachoki, J. & Gacheru, F.** Chuka University). Risky Sexual Behavior of Undergraduate University Students at Chuka University

2. **Kaimenyi, C., Gitonga, L. & Gichunge, C. (**Chuka University). Awareness and Practice of Prostate Cancer Screening Among Men with Urinary Tract Infection at Meru Teaching and Referral Hospital

3. **Mburu, S, & Gitonga, H (**Kirinyaga University, Kenya). Limited Potency of Adjuvant Capecitabine Treatment in TNBC Patients with Residual Invasive Disease

4. **Maina, C. W. (**Kirinyaga University, Kenya). Effect of Prison Programs On Rehabilitation of Inmates in County, Kenya

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Rapporteur	Dr. Victor Musau

1. **Okelo, B.** (JOOUST). On Norm-Attainability of Bounded Linear Operators in Hilbert Spaces and Applications

2. **Esekon, J. (**Kirinyaga University). Analytic Solution of a Nonlinear Black-Scholes Equation via Long and Short Gamma Positions

3. **Kiprono, N. W.** (University of Embu). Orthogonal Idempotents and Continuous Fredholm Operators Under Perturbations

4. **Owuor, J[1], Okelo, B[2]. Owino, J[3]. & Kinyanjui, J[4].** (JOOUST[123], Kirinyaga University[4]). On Dentable Sets and Mappings

5. **Adebayo, O.S[1], Ganiyu, S.O[2], Alli, A.A[3], Rufai,S.A[4], Jubril, A.M[5], Abdulazeez, L[6] , Gadzama, H. E[7]** ([1,4,6]Cyber Security Science Department, Federal University of Technology Minna, [5]Air Force Institute of Technology (AFIT), Kaduna, [2]Information Technology Department, Federal University of Technology Minna, [2]Computer Science Department, Kampala International University, Uganda, [1,3]Computer Science Department, Islamic University In Uganda. [7]Department of Cyber Security, Nigerian Defence Academy, Kaduna). **Two-layer Secured Graphical Authentication with One Time Password (OTP) Verification for a Web Based Applications.**

6. **Gadzama, H. E., Saidu, I. R.** (Nigerian Defence Academy, Nigeria)**.** A Mult-Task System for Detection and Classification of Malware Signatures Using Random Forest Classifier

END OF THE CONFERENCE, 2023

ABSTRACTS

FINANCIAL STRUCTURE AND FINANCIAL INTERMEDIATION EFFICIENCY OF DEPOSIT TAKING, SAVING AND CREDIT COOPERATIVE SOCIETIES IN KENYA

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ABSTRACT

SACCOs in Kenya play a significant role in financial intermediation as savings through them translates to approximately 48.55% of the gross national savings. However, despite these developments, SACCOs are still facing numerous challenges especially in terms of their overall financial structure. For example, there was an increase in the amount of non-performing loan ratio on SACCOS at 6.30 percent back in 2018 from 6.14 percent reported in 2017. This study bridged this research gap by examining the relationship between capital structure and financial intermediation efficiency of deposit taking SACCOs in Kenya. The study adopted a descriptive research design. The target population was all 174 DT-SACCOs in Kenya. Simple random sampling technique was adopted. The study utilized secondary data taken from the financial statements submitted by each DTS to SASRA. STATA was used for data analysis. The research was based on balanced panel data from 2017 to 2021. It was observed that leverage had a positive and significant effect on financial intermediation efficiency of DTS operating in Kenya. The results also indicated that non-withdrawable deposits held had a negative but statistically significant effect on financial intermediation efficiency of DTS. Share capital had a positive and in significant effect on financial intermediation efficiency of DTS operating in Kenya. It was thus concluded that maintaining high-level leverage is crucial for deposit-taking SACCOs in order to enhance their financial intermediation efficiency. The amount of share capital that a DTS has in terms of ordinary share capital, preference share capital and reserves play a very crucial role in determining the overall financial intermediation efficiency. It is recommended that DTS in Kenya should always maintain high leverage level so as to ensure that they are able to diversify their investments as well as help them set out a threshold for the expansion of their business operations.

Key Words: *Leverage, Non-Withdrawable Deposits, Share Capital, Financial Intermediation Efficiency.*

DESKTOP REVIEW ON BUSINESS RECOVERY STRATEGIES POST-COVID

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ABSTRACT

Business recovery strategies in the post-COVID era focus on helping companies recover from the economic impact of the pandemic, which has affected businesses of all sizes and sectors. Some of the strategies employed included cost-cutting measures, diversification, and digitalization. This review seeks to determine the cost cutting measures employed by businesses to reduce expenses and streamline operations, and exploring new revenue streams while finding ways to increasing efficiency, such as automating processes. The review also seeks to determine recovery strategies adopted to recover from the pandemic including expansion into new markets or product lines to help reduce the impact of any specific industry downturn. Digitalization strategy has become increasingly important for businesses in the post-COVID erae-commerce, digital marketing, and online communication tools, to reach customers and improve efficiency. Another important strategy under review is continuity and crisis management which helps businesses to respond quickly and efficiently to unexpected events such as lockdowns, supply chain disruptions, or changes in consumer behavior. Responsiveness and adaptiveness to changing circumstances and customer needs is another key strategy under review since it opens to new opportunities and being agile in the face of challenges. Overall, the COVID-19 pandemic has presented many challenges for businesses, but with the right strategies in place, businesses achieve successful recovery with those able to respond quickly and adapt to new reality more likely to recover and emerge stronger from the crisis.

Key words: Cost Cutting, Diversification, Digitalization. Responsiveness and Adaptiveness, Continuity and Crisis Management

IMPACT OF HIV/AIDS EXPENDITURE ON PREVALENCE OUTCOMES

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ABSTRACT

Over the last three decades, the global HIV/AIDS prevention in community has prompted development of sets of proven strategies aimed at reducing the risk of acquiring or/ and transmitting HIV. The response to HIV/AIDS pandemic is related to international health outcomes and has in the last few decades been among the major global concerns. By 2021, 0.8 percent of adults were living with HIVglobally, with sub-Saharan Africa alone accounting for 69 percent of these cases. Even though significant financial resources from governments and donors have been channeled to combat prevalence especially in sub-Saharan African countries, actual effect has not been empirically assessed. We use longitudinal data from 11 sub-Saharan Africa countries to unravel empirical effects of HIV/AIDS expenditure on prevalence outcomes. In tandem with theoretical hypothesis, our findings empirically emphasize the negative relationship of expenditure and prevalence rates. Thus, the resources channeled towards combating HIV/AIDS significantly reduce prevalence in our sample.

Keywords: *HIV/AIDS, Expenditure, Prevalence, Outcomes*

INTERNET BANKING AND SUSTAINABILITY OF REGISTERED COMMERCIAL BANKS IN KENYA

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ABSTRACT

The rapid growth of Fintech products has resulted in the development of internet banking offered by banks and other telecommunication companies. Internet banking services were initially offered by online financial companies but were later adopted by commercial banks. However, they have been posing threats to operational sustainability of banks especially when offered by other online platforms. Consequently, Commercial banks globally have started showing some signs of distress, and this ought to be examined because of their crucial role in the economy. This study is aimed at examining the influence of internet banking on long-term sustainability of bank in Kenya. The target population of this study was bank employees from Kenya registered banks. The targeted five seniors' officials in each Commercial banks, making a total target population of 210 respondents. A sample of 120 respondents was randomly selected from the target population. Questionnaires were used as the primary method of data collection. Results showed that internet banking had significant influence on sustainability of commercial banks in Kenya. It is recommended that commercial banks entrench online lending platforms to counter the threat of online non-banking lending platforms. This approach would enable commercial banks to have an advantage over non-banking financial service providers in the future.

Keywords: *Internet banking, Fintech, Sustainability and Commercial banks*

EFFECT OF BUSINESS RISKS ON INTEREST RATE SPREAD OF COMMERCIAL BANKS IN KENYA

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ABSTRACT

When a company experiences a high degree of business risk, it may impair its ability to provide investors and stakeholders with adequate returns. This study aimed at establishing the relationship between business risks and interest rate spread of commercial banks in Kenya. It is anchored on a study "determinant of interest rate spread of commercial banks in Kenya". Though several variables were studied, this paper concentrates on the effects of business risks on interest rate spread of commercial banks in Kenya. Correlation research approach was used. Data was collected using questionnaires and analysed using SPSS Version 19. After running different tests: reliability tests, factor analysis, descriptive tests, Pearson correlation, model of fitness and regression, results showed that business risks influence interest rate spread of commercial banks in Kenya. There is need for stakeholders' participation in review of existing policies on stability and soundness of the banking industry. Banks should also explore internal and industry driven strategies to mitigate some of the bank-specific factors associated with higher spreads. Based on the research of this study, it is concluded that business risks played significant role in explaining interest rate spread. It is therefore recommended that policy makers should implement sustainable political and macroeconomic environments to boost investors' confidence. Commercial banks in Kenya should thus participate in the interbank market or use the repurchase agreements for government securities to reduce their liquidity risks.

Keywords: *Interest Rate Spread, Business Risks, Interest Rate*

TEACHING STAFF RECRUITMENT IN TECHNICAL VOCATIONAL AND EDUCATIONAL TRAINING CENTRES IN KENYA

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ABSTRACT

Human resource management is a significant organizational component as it provides for viewpoints, ideals and characteristics of an organization's life, and when appropriately managed, these human characteristics can be considerably advantageous to an organization. As such, effective recruitment becomes a crucial component underpinning human resource management's foundational operations, which encompass acquisition, development and rewarding employees. This study sought to establish the factors affecting staff recruitment in Vocational Training Centres within Kiambu County in Kenya, with human resource planning and job analysis being the variables under investigation. The theories anchoring this study are; institutional theory and the resource-based view theory. Descriptive survey approach was used and a census was carried out involving the top management and heads of departments of the institutions. Data was collected using standardized questionnaires used and thereafter analysis was conducted both quantitatively and qualitatively. Descriptive and inferential analysis was done using Statistical Package for Social Sciences. Results showed that human resource planning was crucial in achieving the laid-out organizational goals. Job analysis was found to communicate the purpose, level of responsibility and scope of the job to potential applicants. Elaborate plans were put in place to nurture and develop employees to enhance their knowledge and skills through reskilling courses, workshops and seminars. With many of them transitioning from craftwork to the classroom, along with the upscaling of credentials to encompass Competence-Based Education, the centres, along with the goodwill of TVETA has created an enabling environment for employees to advance in knowledge and diversify their skillset. The calculated p-value ANOVA score was 0.000 for human resource planning and job analysis. With the critical scores being less than 0.005, it was concluded that the two variables were significant in determining recruitment decisions by vocational training centres.

Keywords: *Staff Recruitment, Job design, Job Analysis, Human Resource Planning*

ASSET STRUCTURE, LEVERAGE, AND
THE VALUE OF LISTED FIRMS: EVIDENCE FROM KENYA

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ABSTRACT

Firm value shows the efficacy of a firm's performance while reflecting the present value of a firm's future cash flows, hence affecting decisions on investments. This study uses secondary data collected from audited financial expositions to explore the relationship between asset structure, leverage, and the firm value of 51 listed firms between 2010 and 2019. The study applies panel data regression models and causal-comparative research design. Quantitative data was analyzed using multiple regression. Result showed that Plant, equipment, property, current, and financial assets influence the firm value positively. Nonetheless, the quotient of current to total assets was reported to yield the highest beta coefficient implying that significant firm value creation is realized for every additional current asset held, weighed against the quotient of additional equipment, property, and plant to the value of total assets. Leverage had an insignificant influence on the value of firms, implying that no maximization of value is attainable in manufacturing firms through astute use of borrowed funds. We recommend that finance pundits consider firms' asset structure and use of borrowed funds when formulating financial and investment policies. The study enriches the scholarly world by developing a model for establishing the value of listed firms.

Keywords: *Assets, Leverage, Value, Listed*

STRATEGIC MARKETING APPROACHES AND MARKET PENETRATION BY GENERAL INSURANCE COMPANIES IN KENYA

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ABSTRACT

The insurance industry is faced with a number of challenges the world over, among them the internationalization and globalization leading to increased competition. In Africa, the nature of competition in the Insurance industry has generated various levels of marketing strategies and applications. All players in the insurance industry are competing for the limited insured population. There is much mistrust of the insurance sector among the population mostly out of ignorance, hence the need for a comprehensive awareness programme in order to tap the vastly un-served market hence the need for insurance companies to be innovative in their marketing approaches. The purpose of this study was to determine the effects of strategic marketing on market penetration of the general insurance companies in Kenya. The study sought to establish whether direct response marketing has a significant effect on market penetration of general insurance companies in Kenya; to establish the effects of electronic marketing on market penetration of general insurance companies in Kenya, establish whether strategic alliances have a significant effect on the market penetration of general insurance companies in Kenya. The study was guided by the resource dependence theory, commitment trust theory and resource based view theory. Descriptive research design was used and the target population was 160 employees in general insurance companies in Nyeri County from which a sample of 64 respondents was selected. Data was collected using questionnaires. Multiple regression analysis was used to establish the relationship between the dependent variables and the independent variables. Results showed that direct response marketing had a positive and significant influence on market penetration (Coefficient/beta =0.131, P-value= 0.001), effect of electronic marketing was positive but insignificant (Coefficient/beta =0.162, P-value=0.063), while strategic alliances were positive and significant (Coefficient/beta was 0.196, P-value = .031). This implied that if the general insurance companies were to increase market penetration, they should not only use the traditional methods of marketing (direct marketing), but have to be innovative and employ strategic alliances as a marketing penetration strategy among other marketing methods.

Key Words: *Market Penetration, Direct Response Marketing, Electronic Marketing and Strategic Alliances*

PROJECT MANAGEMENT PRACTICES IN SCHOOL CONSTRUCTION PROJECTS

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ABSTRACT

The study examined the project management practices used in school construction projects. Mixed methods of inquiry were used in the cross-sectional study. The target population comprised 920 headteachers and 82 District Education Officers (DEO). A sample of 279 respondents was scientifically determined and proportionately apportioned as 257 headteachers and 22 DEOs. Purposive sampling was used to sample regions, stratified random sampling with replacement to sample headteachers and simple random sampling to sample DEOs. Headteachers filled out questionnaires while DEOs were interviewed. Pilot testing of the questionnaire was done on 28 headteachers. Cronbach alpha was used to ensure reliability while peer review and pilot testing ensured validity. Responses were received from 247 head teachers and 20 DEOs. Thematic analysis was used to analyse interview data while descriptive statistics was used to analyse quantitative data. School construction projects were identified and selected largely without stakeholder involvement. Results showed that project management practices varied from school to school and were localized as the Ministry of Education and Higher Studies (MoEHS) was not hands-on with its policies largely due to budgetary constraints. Project management practices were significantly influenced by availability of project financing or lack of it which influenced which projects were mounted, the number of projects undertaken and how they were implemented and eventually the projects' performance realized. Completed construction projects were put into use before they were inspected for compliance with the school infrastructure policy. Headteachers oversaw project implementation and ensured project clean-up was done. There is a need to involve the stakeholders through the project cycle to increase projects' performance. Since headteachers doubled in as project managers for the school construction projects, there is a need to train them on basic project management skills. There is also need for Headteachers to explore other ways of financing school construction projects such as public-private partnerships and soliciting funding from donors and development organizations since community participation and MoEHS funding yielded inadequate funding in many of the schools surveyed.

Keywords*: Project Management Practices, Construction Projects, School Infrastructure, Public Schools, Physical Facilities.*

ENVIRONMENTAL MUNIFICENCE AND PERFORMANCE OF INSURANCE COMPANIES IN KENYA

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ABSTRACT

In the last 5 years, the Kenyan economy has been experiencing turbulence and the market has been unstable for business. Some businesses have reported losses, others gone under while majority are barely surviving on government aid. This is partly attributed to the prolonged drought, insufficient rainfall, Covid 19 pandemic, Russia-Ukraine war and the long campaign period for 2022 general elections. The insurance industry has been hard hit considering majority of Kenyans consider insurance as secondary service. This implies that any reduction in their disposable income reduces their chances of acquiring an insurance cover. This study sought to determine the effect of environmental munificence on performance of insurance companies in Kenya. The indicators for environmental munificence were market share, market orientation and sales growth. Performance of insurance companies was measured through analyzing the return on assets. All the 55 registered and licensed insurance companies in Kenya were included in this study. A regression model was used to test the relationship among the interacting variables. Environmental munificence had a negative significant effect on return on assets. During the period under review, market share and sales indicated a negative effect on return on assets while market orientation had insignificant statistical results. It is concluded that improvement in environmental munificence results to increase in return on asset while a decline in environmental munificence leads to negative results. There is need for insurance companies to first study the environment to determine whether its munificence or not before introducing products or services to the economy. The findings of this study will be helpful to students and scholars, business's particularly insurance companies and the government.

Keywords: *Environmental Munificence, Performance, Insurance Companies, Market Share, Market Orientation and Sales Growth*

EFFECT OF INTERNAL CONTROL SYSTEMS ON FINANCIAL PERFORMANCE OF PUBLIC UNIVERSITIES IN KENYA

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ABSTRACT

A number of private universities have reported better financial performance than public Universities across the world. The dismal financial performance in public universities can be ascribed to poor financial management practices due to lack of robust internal control systems. Though financial management and internal control systems are essential, there exists only a few studies and empirical evidence on the relationship between financial performance and internal control systems in public universities in Kenya. This study investigated the effect of internal control systems on financial performance of public universities in Kenya. The research was informed by the systems theory, agency theory, attribution theory, and stewardship theory. The research adopted a causal research design, and targeted 160 respondents from 32 public universities. Census sampling technique was applied. Semi-structured questionnaires and secondary sources were used to collect primary and secondary on the financial performance of public universities for five years. The study respondents were the Deputy Vice chancellors (finance), Registrars, In-charge ICT, Finance Officers and Internal Auditors. A total of 142 questionnaires were returned duly filled representing 88.75%. Data was analyzed using Descriptive and inferential analysis. A pilot study was conducted to examine the reliability and validity of the research instruments and instrument adjusted accordingly. Diagnostic tests were carried out and the data was found to be normally distributed and did not suffer from multicollinearity and heteroscedasticity. Results showed that preventive controls regressed individually against the dependent variables. It was concluded thatinternal control system had to a large extent effect on financial performance of public higher learning institutions. There is need to strengthen internal control systems in state corporations to improve financial performance of internal control systems.

Key Word: *Internal Control Systems, Preventive Controls, Financial Performance, Public Universities*

TWO ECONOMIC LAWS OF HOUSEHOLD CONSUMPTION FUNCTION: A CASE OF KENYA

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ABSTRACT

The study investigates two economic laws of household consumption in the 1960 to 2020 using Kenya as a case study and using the generalized least (GLS) method. The two laws are: (a) the household marginal propensity to consume (MPC) in the short run is not significantly different from 0.43. (b) In the long run the household MPC is not significantly different from the positive square root of 0.43. These two laws fall within the campus of the Keynesian consumption function. Empirical findings from four consumption models indicate that the long run MPC in Kenya during the aforementioned period exhibited the following values: 0.646, 0.677 0. 685, 0.686 respectively; and were not significantly different from 0.656. Meanwhile, in the short run the MPC in Kenya during the given period was 0.431; and was not significantly different from 0.43. These findings may have resulted from the fact that the short run MPC is the product of average propensity to consume (APC) and long run MPC. (b) In the long run values of the respective APC and MPC tend to be equal to each other. The implication of the findings is that the MPC tends to move towards a common global equilibrium, for the simple reason that human beings often tend to have similar demands and consumption patterns.

Keywords: *Average Propensity to Consume, Household Disposable Income, Household Consumption, Household Consumption Function, Household Consumption Economic Laws and Marginal Propensity to Consume*

CUSTOMER DEFAULT PREDICTION IN LIPA POLE POLE MODEL IN KENYAN BUSINESS ENTERPRISE

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ABSTRACT

Predicting customer churn in a pay-as-you-go (PAYG) model is crucial to identifying customers who are likely to stop using the service shortly. To make the most effective financing decision, we employ a genetic algorithm (GA) based optimization method. GA is preferred because of its convergence and adaptability when dealing with multi-objective optimization issues including credit evaluation, portfolio optimization, and bank lending decisions. To further improve the performance of the model and reduce bias, we use Synthetic Minority Over-sampling Technique (SMOTE) in the training process. This technique generates synthetic samples of the minority class, thereby increasing the number of samples in the minority class and making the model less likely to be biased. In addition, we use grid search to systematically explore the hyperparameter space, training and evaluating a model for each combination of values. This approach allows us to find the optimal combination of parameters that lead to the best performance. Based on the literature review, boosting algorithms have the highest prediction accuracy. Among the boosting algorithms, Gradient Boosting classifier performs generally better in the base model followed by Random forest (RF). RF is preferred most due to it being less prone to over-fitting than other algorithms. GA-GBC results to accuracy of 84.28% while GA-RF of 84.14%. Additionally, by relevant finetuning and parameter search during training and boosting algorithms, increases performance and accurate predictions.

Keywords: *Genetic Algorithm, Customer Churn, PAYG, Optimization.*

CREDIT PRUDENTIAL GUIDELINES AND LOAN PERFORMANCE OF MICROFINANCE BANKS IN KENYA

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ABSTRACT

The credit prudential guidelines comprise interventions promulgated by Central Bank of Kenya aimed at mitigating credit risk faced by the banking sector. When they were issued, these guidelines which include: loan classification criteria, loan provisioning guidelines, loan write-off procedures and loan renegotiations were said to be key pillars in combating the non-performing loans menace that dogged the banking sector since independence in Kenya. Nonetheless, a review of studies carried out to evaluate the effectiveness of credit prudential guidelines in meeting this objective have provided conflicting results. It is this inconclusive situation that has motivated a follow-up study to establish an accurate empirical position. The study therefore sought to investigate the relationship between credit prudential guidelines and loan performance among the Kenyan microfinance banks by determining the influence of loan classification criteria, loan provisioning guidelines, loan write-off procedures and loan renegotiation policy on loan performance among the licensed microfinance banks in Kenya. The study was anchored upon the regulatory capture theory and the Laffort and Tirole Model. The study adopted descriptive survey research design and targeted 14 microfinance banks registered and licensed to operate in Kenya as of 31st December 2021. Structured questionnaires were used to collect primary data on the independent variable in all the 14 MFBs. A data collection sheet was used to collect secondary data on the dependent variable over a 10-year period (2012 – 2021). Respondents comprised the branch managers and credit officers. Both descriptive and inferential statistical analysis techniques were employed to obtain the results. Results showed that all the four credit prudential guidelines used in the study had a negative and significant influence on loan performance among Kenyan microfinance banks; implying that their implementation led to lower NPL ratio. Consequently, it is recommended that management of the microfinance banking institutions should continuously institutionalize the four credit prudential guidelines as primary tools for managing credit risks. Further, the Central Bank of Kenya should strengthen the credit supervision function to negate the growing trend in non-performing loans among the lenders by instituting appropriate sanctions

Keywords: *Credit Prudential, Credit Risk, Banking Sector, Loan Classification Criteria, Loan Provisioning Guidelines, Loan Write-Off Procedures and Loan Renegotiations*

INFLUENCE OF ASSET QUALITY ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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ABSTRACT
There exist bank factors that if not controlled would lead to bankruptcy of financing banking institutions. In Kenya, Imperial Bank and Chase Bank were placed under liquidation due to liquidity problems. CBK established performance of Banks whereby 8 Banks obtained a negative ROA as a result of poor investments. The main objective of this research was to establish the influence of Asset quality on performance of Kenyan Commercial Banks. This study was guided by pecking order theory. The study used a cross sectional but descriptive survey design on 39 commercial banks incorporated under census survey. Secondary data was retrieved from annual financial statement reports of Kenyan Commercial Banks. This study would help both managers Commercial Banks and the government of Kenya as it seeks to develop the banking sector and enhance financial growth. Panel data was used and hypothesis test at a significance level of 0.05. Descriptive analysis included; skewness, kurtosis and jarque beta while inferential analysis involved correlation analysis. Assumptions of linear regression based on normality test and linearity were tested. Data was presented in form of tables and models. Asset quality significantly influenced performance of commercial banks. Panel data Pearson correlation results show a moderate significant negative association between asset quality and financial performance of Commercial Banks since $p = 0.0000$ ($p<0.05$). Fixed effect simple regression analysis showed that non-performing loans to total loans $p = 0.000$ ($p<0.05$) had a significant and positive influence on financial performance as non-performing loans to operating income $p = 0.010$ ($p<0.05$). It is recommended that Commercial Banks should monitor loans granted to reduce cases of loan nonperformance.

Keywords; *Commercial Banks, Asset Quality, Financial Performance*

EFFECT OF CUSTOM DUTY INCENTIVES ON FINANCIAL PERFORMANCE OF MANUFACTURING COMPANIES IN KENYA

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ABSTRACT

The Purpose of the study was to assess the effect of custom duty incentives on financial performance of manufacturing firms in Kenya. The study focused on the manufacturing companies registered by Kenya Association of Manufacturers. 447 manufacturing companies in the register of Kenya association of Manufacturers in 2019 were included in the study. Stratified random sampling technique was used to determine the sample size, and 211 manufacturing companies were selected for the study. Primary data was collected using questionnaires targeting accountants and other senior management officers in the manufacturing companies. Secondary data was collected from audited financial statements covering a period of 10 years from 2009 to 2018. The response rate on the questionnaires was 73.5 %. Data was analysed using SPSS version 25. Both descriptive and inferential statistics were used and diagnostic tests involving multi-collinearity tests, auto-correlation, heteroscedasticity and test of normality carried out. The data did not suffer from multi-collinearity neither was there auto-correlation. However, the data violated the assumption of normality. The study applied ordinal regression analysis to determine the predictive model. Pseudo-R square was computed which showed that custom duty incentives explains 4% of the change in financial performance meaning there are other factors that contribute to the change in financial performance. Custom duty incentive was significantly related to financial performance of manufacturing companies. It was concluded that custom duty contributes positively to the financial performance of manufacturing companies in Kenya and that manufacturing companies should embrace custom duty incentives offered by the government.

EFFECT OF CONTRACT FARMING ON MARKET ACCESS AMONG TOMATO FARMERS IN KAJIADO COUNTY, KENYA

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ABSTRACT

Market access plays a vital role in enhancing social welfare and economic growth. However, due to the rapid liberalization of markets worldwide, competition among market players has greatly intensified thus posing a challenge for farmers to access consumer markets. This study examines the effect of contract farming on market access among tomato farmers in Kajiado County using a cross-sectional survey research design. The study was based on a sample of 200 tomato farmers in Kajiado County. Stratified, purposive and snowball sampling was used to select the units of observation. Data was analyse dusing both descriptive and inferential statistics. Results showed that market access was significantly influenced by contract farming. In general, contract farming among farmers with supermarkets, learning institutions and public facilities had a significant effect on enhancing access to consumer markets thus the need for more farmers to implement contract farming strategies to avoid exploitation and inability to reach consumers.

Keywords: *Market Access, Social Welfare, Economic Growth, Contract Farming*

ROLE OF ENTREPRENEURIAL (EO) IN MARKETING STRATEGY IMPLEMENTATION BY GARMENT MAKING MICRO ENTERPRISES IN NAKURU, KENYA

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ABSTRACT

Entrepreneurial Orientation (EO) is closely related to strategic decision-making process in business. A number of scholars argue that entrepreneurs tend to implement marketing strategies dependent on their skills, own experiences, and attitudes. This entails a strong unswerving orientation toward quest for opportunities for growth. As an entrepreneur in the garment-making industry, one needs to be innovative, risk-taking, autonomous, and proactive in order to remain competitive in the market. This is because EO is a main resource and capacity on 'firm growth. Pro-activeness in competition, innovativeness and willingness to take risks are critical to development of competitiveness to all types of businesses. However, no known study on marketing strategies has looked into the dimensions of EO in the garment-making sector and not all garment-making micro-enterprises are innovative, pro-active or open to risk. This study seeks to highlight the role EO in implementation of marketing strategies by entrepreneurs in the garment-making sector. The study employed *ex post facto* design with the main data collection instrument being a questionnaire which comprised of open and closed ended questions. Principal Component Analysis (PCA) was used to determine marketing strategies and EO factors that influence their implementation. The EO factors influencing implementation of marketing strategies by the garment making micro enterprises were identified as Autonomy, Risk-taking, Innovativeness and Pro-activeness. All the marketing strategies were positively influenced by entrepreneurial orientation in one way or another. Thus successful implementation of these strategies was dependent on the entrepreneur. In particular, Market Penetration was significantly influenced by all the orientations while, Pricing was only influenced by risk-taking and pro-activeness. Based on these results, the hypothesis that entrepreneurial orientation of the garment making entrepreneur does not significantly influence the implementation of the marketing strategies was rejected. This implies that EO is key to marketing practices of any garment-making enterprise

Keywords: *Micro Enterprises, Entrepreneurial Orientation, Marketing Strategies, Implementation*

LOAN MONITORING STRATEGIES AND LOAN REPAYMENT PERFORMANCE OF REVOLVING FUNDS IN KENYA

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ABSTRACT

The goal of this study was to investigate the influence of loan monitoring strategies on repayment performance of the revolving funds in Kenya. Specifically, the study evaluated the relationship between Number of monitoring visits, Number of arrears report and the repayment performance. A conceptual framework was used to determine factors that influence revolving fund repayment performance in Kenya. The study adopted descriptive correlational research design. A Stratified random sampling and purposive sampling techniques was utilized to give a sample of 181 youth and Woman Enterprise Fund officers in Kenya, while a questionnaire was used to collect primary and secondary data. Multiplelinear regression was used to test the research hypothesis and demonstrate the relationship between the variables. Results showed that the number of monitoring visits and arrears report had a positive and significance effect on repayment performance of revolving funds in Kenya. With a huge demand for low-interest fund schemes globally, a study focusing on Kenya's recovery strategies, which is a leader in the financial market in East Africa; promotes sustainability of the funds through proper management of the revolving schemes.

Previous studies have focused on the default rates of revolving funds in Kenya as well as the challenges facing the funds. This study went further to investigate the strategies put in place that influence repayment performance of revolving funds. The study contributes to the body of knowledge by establishing strategies that influence rate of repayment performance of revolving funds.

Key Words: *Client Appraisal Strategies, Rate of Repayment, Strategies, Default Rate, Revolving Fund.*

GREEN ENTREPRENEURSHIP AS A PANACEA FOR FINANCIAL SUSTAINABILITY OF BUSINESSES IN KENYA TODAY

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ABSTRACT

This study aims to provide an analytical framework that focuses on green entrepreneurship as a mechanism through which businesses obtain their financial sustainability in Kenya.The research employed explanatory design and random samplingtechniques to obtain data from a sample of 376 businesses in Kenya using a structured self-administered questionnaire.Results indicate that green entrepreneurship strongly impacts the financial sustainability of businesses in Kenya, and that three variables significantly predict the financial sustainability of businesses in Kenya. Results showed that creative green entrepreneurship at (β = 0.41, $p < 0.05$), green washing at (β = 0.33, $p < 0.05$) and institutional Structure at (β = 0.21, $p < 0.05$) all had a positive and significant effect on the financial sustainability of Businesses. Results further showed that green entrepreneurship affects financial sustainability of businesses in Kenya in the direct effect model and that green entrepreneurship and Financial Sustainability of Businesses in Kenya today have a strong influence in cultivating new business models that can make important contribution to the Green Growth transition.Green entrepreneurship among businesses is thus a critical asset for sustainability through creative, green washing and institutional green entrepreneurship. Financial sustainability of Businesses in Kenya as confirmed by the study findings can be enhanced through green entrepreneurship awareness to improve impact and return on investment.

Keywords: *Green entrepreneurship, Panacea, Financial Sustainability, Businesses and Today*

EFFECT OF TECHNOLOGY–ORGANIZATION–ENVIRONMENT FRAMEWORK AND ENTREPRENEUR PRACTICE IN KENYAN PUBLIC UNIVERSITIES

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ABSTRACT

The main aim of the paper was to determine the effect of Technology– Organization– Environment (TOE) Framework and Entrepreneur Practice in Kenyan Public Universities. The study was anchored on institutional theory. The target population comprised of 2863 academic staffroom in 5 chattered public universities in Nairobi County. The study used stratified and random technique to choose a sample of 342 university's academic staffroom 5 strata's representing each university in Nairobi County, Kenya.The findings showed in technology and organization context positively affect entrepreneurial practices in university. However, environmental context had insignificant effect on entrepreneurial practices in university. The study concludes that advancements in technology and supportive organizational structures can promote entrepreneurship and help university students and faculty develop their entrepreneurial skills and bring new ideas to market. However, external factors, such as the regulatory environment or local market conditions, may not have a major influence on entrepreneurial activities within the university setting. The results of the study provide important insights into how universities can support and encourage entrepreneurship among their students and faculty. These findings highlight the importance of universities investing in technology and organizational support to promote entrepreneurship among their students and faculty. By doing so, they can help foster a culture of innovation and drive economic growth and development in their communities.

Keywords: -*Technology context, Organization context, Environment context, TOE Framework, Entrepreneur Practice, Public Universities*

EFFECT OF FINANCIAL INVESTMENT ON SUSTAINABILITY OF NON-GOVERNMENT ORGANIZATIONS BEYOND DONOR FUNDING IN NAIROBI COUNTY

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ABSTRACT

Non-government organizations (NGO's) increasingly seek to enhance sustainability of the performance by consciously developing strategies and policies that promote continuity. The general objective of the study is to determine the effect of financial investment and sustainability of non-government organizations NGO's beyond donor funding in Nairobi County. The study followed positivism approach and collected data using structured questionnaire from top management staff of328 donor funded NGOs registered in Nairobi County. Descriptive and inferential statistics were used to analyze data and to test the hypotheses. Results showed that financial investment had positive and significant effect on sustainability of non-government organizations beyond donor funding. The study concluded that the financial investment is fundamental contributor to sustainability of non-government organizations beyond donor funding. There is need to use financial investment returns to enhancing sustainability of non-government organizations.

Keywords: *Sustainability, Financial Investments and NGO's*

INFLUENCE OF GROUP DYNAMICS ON THE GROWTH OF YEDF- FUNDED YOUTH GROUP BASED ENTERPRISES IN NAIROBI COUNTY, KENYA

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ABSTRACT

This research work was conducted in Nairobi County in Kenya. The Youth Enterprises Development Fund (YEDF) was conceived in Kenya in 2006 with an aim encouraging the youth to actively participate in the country's economic growth through enterprise development. It was mandated to extend credit to the youth to start and grow their enterprises. Since most of the youth lack credit collateral the YEDF required them to form groups for them to start group enterprises where each member act as collateral for the group loan. Nairobi County is the smallest but the most populous of Kenyan counties with majority of the youth engaging in entrepreneurial activities in deed it has the highest uptake of the YEDF loans amounting to 2.3 billion and highest repayment rate of 48%. There were in total 255 group enterprises that formed the target population for this research work. A sample size of 156 group enterprises was arrived at and using a self -administered questionnaire data was collected where 121(77%) responses out of the sample were returned. The respondents were group leaders. The main group Dynamics aspects of interest were group leader characteristics and considerations made before joining the group. After analysis of data, it came out clearly that both group leader characteristics and considerations made before joining the group were significant in explaining the growth of youth group based enterprises in Nairobi County. Group leader characteristics especially the, age and entrepreneurial experience played the greatest role followed by considerations made before joining the group. In deed group leader characteristics had r of 0.297 while for considerations made before joining a group had an r 0.229 showing one-unit increase in group leader characteristics and considerations contributed to 8.8% and 5.3% growth respectfully.

Keywords: *Group Leader Characteristics, Considerations Made Before Joining a Group, Youth Enterprises Development Fund, Growth of Youth Group Based Enterprises*

INFLUENCE OF EMPLOYEES TRAINING ON ORGANIZATIONAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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ABSTRACT

Survival of any organization in the competitive society lies in its ability to train her employees to acquire knowledge and skills in order to be creative and innovative to enhance organization performance and increase competitive advantage. The more organizations seek excellence; the more employees' training becomes necessary. Training needs analysis is thus critical to advise organizational training programme. Due to increased competition arising from globalization, there has been emphasis on training to improve organizational performance. This study sought to determine the influence of employee training on organizational performance of Commercial banks in Kenya. It is based on a comprehensive review of literature to determine the effects of employee training that establish what other researchers have established in the link between employees training on organizational performance. The study was guided by three theories: social exchange, Human capital and resource base views which were reviewed to establish the effect of employees training on the overall organizational performance. Most of the studies reviewed used descriptive research design and inferential statistics in the analysis of data collected using questionnaires and interviews. Continuous Employee training has a significant role in enhancing organizational performance and does not imply only obtaining new knowledge, abilities and skills, but also the possibility to introduce employees to changes, attitude change and involving them actively in the process of decision making. This study will provide baseline data that can be used to make informed decisions on the need for employee training on performance of commercial banks in Kenya.

Keywords: - *Employee Training, Resource Base View, Social Exchange, Human Capital, Organizational Performance*

WORK LIFE BALANCE AND EMPLOYEE RETENTION IN PUBLIC LEVEL FIVE HOSPITALS IN KENYA

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ABSTRACT

Work-life balance practices are human resource practices that ensure alignment of work and personal life. Retention of employees is a strategy that an organizations use to keep employees from preferring employment elsewhere. This investigated the influence of work-life balance on staff retention in public level five hospitals in Kenya. Specific objectives of the study were; to establish the influence of employee assistance programs and work schedules on staff retention in public level five hospitals in Kenya. The study adopted descriptive and correlational research designs. The study targeted 472 doctors, 3318 nurses and 449 clinical officers from the eleven (11) public level five hospitals in Kenya. Proportionate stratified random sampling design was used to select eight (8) public level five hospitals from which a total sample size of 40 doctors, 278 nurses, and 37 clinical officers were selected. Data was collected using a semi-structured questionnaire. Cronbach alpha was used to test reliability of the research instruments. Both descriptive and inferential statistics were used to describe study findings based on the objectives. Tables and percentages were used for descriptive statistics while Binary Logistic Regression Model computed using SPSS Version.23 was used for data analysis. Results showed that employee assistance programs significantly influenced retention of health workers'. Availability of work schedules did not influence retention. Employee assistance programs significantly influenced employee retention. There is need for management to invest in improving employee assistance programs to encourage employees to remain in the hospitals. Management should also design new approaches relating to work schedules so as to attract and retain their talented workforce.

Keywords: *Work life balance, Retention, Public Level Five Hospitals, Employee Assistance Programs, Work schedules*

IMPACT OF TOURISM ON THE ECONOMY OF RWANDA: SOCIAL ACCOUNTING MATRIX (SAM) ANALYSIS

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ABSTRACT

The primary objective of this study was to evaluate the economic impact of tourism and assess the strength of tourism inter-industry linkages in Rwanda's economy for the year 2013/2014. The SAM model was used to estimate the impacts and linkages of tourism in terms of output production, employment generation, labour income earnings and total value creation. The economic models identified and quantified the linkages between different sectors of the economy. The relationships between expenditure and output, and income and employment (direct and indirect) were described by multipliers. Data for analysis was sourced from EORA multi-region input-output table (MRIO) database: http://www.worldmrio.com/

All impacts have a starting point in the economy, defined as the direct effect that set off iterations of indirect (inter-industry production). Total tourism expenditure/consumption, which triggers direct effects, consists of internal tourism consumption as an aggregate that describes the size of direct visitor acquisition within a country of reference. Internal tourism expenditure (a portion of internal tourism consumption) was used as a basis for calculating tourism multipliers and their associated effects. There are several different types of multipliers depending on the secondary effects included and the measure of economic activity used. The common multipliers computed were associated with output, income, value addition and employment in the economy for the years 2013/2014. Multipliers were decomposed into their various multiplier effects: initial and production effects. Approximately $286 million worth of internal tourism expenditure/consumption in the economy created 72,000 jobs (13% of economy-wide employment) and generated $195 million in labour income (6.4% of national labour income), $381 million in total value addition (6.8% of national total value) and $803 million in output (7.3% of national output).

This study is useful in analysing the effects of changes in tourism expenditure/consumption, effects of policies and regulations that directly or indirectly affect tourism, resource allocation, policy and management of tourism development strategies. In this study, internal tourism expenditure (a portion of internal tourism consumption) was used as a basis for calculating relevant multipliers and their associated effects. Future studies can re-estimate the multipliers by considering internal tourism consumption in its entirety. A more robust methodology such as Computable General Equilibrium (CGE) models can be considered for further analysis.

Keywords: - *Tourism Satellite Accounts, Tourism Internal, Social Accounting Matrix Expenditure/Consumption, Rwanda*

MEDIATORY EFFECT OF PERCEIVED BEHAVIORAL CONTROL ON THE RELATIONSHIP BETWEEN VISITOR INTENTIONS AND BEHAVIOUR IN DOMESTIC HERITAGE TOURISM

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ABSTRACT

Heritage tourism remains an important component of tourism for many local and global destinations. Thus, a clear understanding of the factors that influence heritage tourists' behaviour is critical in formulating policies and promotional programmes for its enhancement. Previous studies in tourism basing on the theory of planned behaviour (TPB) have revealed that the intention to tour a place serves as an effective predictor of the actual visit behaviour. Furthermore, researchers generally acknowledge that intention and perceived behavioral control are potential factors towards actual visit behaviour. However, some researches (Sheeran, 2002) have found that intention alone does not always directly translate into actual behaviour. This study sought to address this discrepancy by assessing the mediatory effect of perceived behavioral control on intention and visit behaviour in the context of domestic heritage tourism in the Kenya coast tourist circuit. Data on domestic tourists' intention to visit heritage attractions, perceived behavioral control, and visit behaviour was collected. Questionnaires were distributed among domestic tourists visiting the ten sampled historical heritage sites in the Kenya Coast region. Data from a total of 693 domestic tourists was analyzed using the Sobel test 1982. Results showed that perceived behavioral control is a partial mediator between intention to visit heritage attractions and the actual behaviour of visiting these attractions. This finding presents the benefits of reconsidering the importance of perceived behavioral control in promoting domestic tourism to heritage attractions and provides empirical evidence to support policy-making and guide further research in tourism marketing and heritage management.

Keywords: *Domestic Tourists; Heritage Tourism; Kenya; Mediation Effect; Perceived Behavioral Control; Visit Behavior; Visit Intention.*

DETERMINANTS OF SOCIAL CLASS AS DEMOGRAPHIC SEGMENTATION PRACTICES ON CONSUMER CHOICE OF READY TO WEAR CLOTHES IN KENYA

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ABSTRACT

Segmentation is the division of a large market into smaller homogeneous markets targets on the basis of common needs and/or similar lifestyles. One of the primary aims of segmenting a business sales programme is to focus on the subset of prospects that are mostly likely to purchase its offering. Segmenting on social class as demographic variables involves dividing consumers with regard to their income, and occupation. Part of The psychographic variables is social class. This study segmenting therefore sought to fill the existing knowledge gap by focusing on social class as demographic segmentation on consumer choice of ready to wear clothes. The study specifically focused on the influence of social class on consumer choice of ready to wear clothes in Kenya. The study adopted, marketing mix theory and location theory. The study adopted descriptive survey design to obtain in-depth information from the respondents. The study used purposive sampling to select ready to wear shops from the three cities in Kenya namely: Nairobi, Mombasa and Kisumu. Data was analysed using both descriptive and inferential statistics. Correlation analysis was employed to determine the relationship of variables. The findings indicated that there was a positive significant relationship between social factors and consumer choice of ready to wear clothes as shown by a regression coefficient of 0.449. The study recommended a study be done on market analysis to determine customer demand in terms of the market needs. Knowledge of all relevant aspects of consumer perceptions of products and how they can be useful for managerial practice. According to perceived values in ready to wear industry, different sets of products and different types of advertising strategies should be applied for people of different status.

Keywords: *Demographic, Segmentation and Social class*

EFFECT OF COLLECTIVE BARGAINING AGREEMENT ON EMPLOYEE RETENTION AMONG MEDICAL PRACTITIONERS IN COUNTY GOVERNMENTS IN KENYA: A CASE STUDY OF KIRINYAGA COUNTY

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ABSTRACT

County governments in Kenya have advised employee retention strategies in a bid to safeguard their valuable human resource. This analyzed the effect of collective bargaining agreement on employee retention among medical practitioners in Kirinyaga County. The study adopted a descriptive research design. The target population was 930 medical practitioners. A sample size of 272 participants was obtained through Krejcie and Morgan tables and stratified random sampling. Primary data was collected using mixed questionnaires from selected respondents while secondary data was sourced from Kirinyaga County website and database. Data was analyzed using descriptive and inferential statistics. A regression model of CBA predictors was run against employee retention. Based on the findings, the coefficient of correlation ($r = 0.641$) revealed that there existed a moderate strong positive relationship between collective bargaining agreement implementation and employee retention. The coefficient of determination ($R^2 = .411$) revealed that collective bargaining agreement implementation explained about 41.1% of the changes in employee retention among medical practitioners in County Governments in Kenya. This shows that 58.9% of the employee retention could be explained by other factors other than CBA implementation. This led to the conclusion that CBA implementation had an effect on employee retention among medical practitioners in County Governments in Kenya. It is recommended that the County Governments in Kenya implement collective bargaining agreements entered into with the medical practitioners to enhance employee retention.

Keywords: - *Collective Bargaining Agreement, Employee Retention*

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EFFECT OF DIGITAL MARKETING STRATEGIES ON THE SALES GROWTH OF COFFEE EXPORT IN KENYA

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ABSTRACT

Kenya benefits from the export of coffee because it creates jobs, strengthens international bonds, brings in foreign currency, and fosters economic and physical development in the country. However, over the past two decades, Kenya's coffee sector has experienced challenges. Scholars have discussed factors that affect exports in general, highlighting areas like GDP per capita, real exchange rates, world production, export capability as well as foreign direct investment. However, digital marketing strategies have not been investigated as to whether they are effective ways of increasing sales for coffee produced in Kenya. Uganda was among the top ten countries that produced coffee for widespread consumption around the world and in order to increase chances of success in the face of competition, they capitalized on domestic market, established a profitable worldwide market, and automated their coffee marketing methods. It is through this understanding that the study sought to evaluate the effect of digital marketing strategies on sales growth of Coffee export in Kenya. Cross-sectional survey was adopted as the blueprint, while target population was all 157 coffee marketing firms in Kenya. Respondents were randomly selected to a sample size of 384 units. To assess multiple correlation problems, correlation matrix was applied and Multiple linear regression used for analysis. The study revealed that digital marketing strategies had a positive and significant effect on sales growth of Coffee exports in Kenya ($\beta 2 = 0.821$, $p<0.05$). Hence, hypothesis was rejected. Regression analysis revealed the same positive effect of digital marketing on sales growth at ($P<0.000$) significance. Digital marketing strategies played a significant role in the sales growth of coffee export in Kenya, hence the need to use digital marketing strategies like search engine optimization (SEO), social media marketing (SMM), and email marketing to increase their sales.

Keywords: - *Digital Marketing Strategies, Sales Growth, Coffee Export*.

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SUPPLIER EVALUATION MANAGEMENT PRACTICEAND SUPPLY CHAIN PERFORMANCE OF KENYAN SELECTED COUNTY GOVERNMENTS OF NYANZA REGION

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ABSTRACT

Adequate evaluation and development of supplier base can reduce costs of public projects and even boost value. However inadequate supplier scrutiny can lead to high costs, non-performance risks and poor quality of the deliverables. Having poor relations with suppliers' leads to loss of value. The main study objective was to establish the effect of supplier evaluation management practice on supply chain performance of Kenyan Selected County Governments of Nyanza Region. This study employed a descriptive and correlational research design, the target population of 112 procurement staff and 9 lead prequalified suppliers of the Selected County Governments in Nyanza Region of Kenya. The study sampled population by stratified, simple random and purposive techniques. Closed ended questionnaires and an interview schedule were used to collect data. Descriptive and inferential statistics were used. Descriptive statistics employed frequencies, percentages, mean and standard deviation. Inferential were employed through Pearson correlations and simple linear regression. Content analysis was used to analyze data from collected through interviews. Results showed that supplier evaluation management practice had a positive and significant effect on supply chain performance in selected county governments of Nyanza region, Kenya. It is recommended that devolved units in Kenya should evaluate suppliers to ensure that effectiveness, quality improvement and customer satisfaction are realized. This can be achieved through quality commitments, distributions, delivery strategy and evaluating the cost hence improve performance of supply chain of devolved units.

Keywords: - *County Government, Supplier Evaluation Management Practice, Supply Chain Performance.*

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SUBTHEME TWO: - EDUCATIONAL TECHNOLOGY AND REFORMS

IMPLEMENTATION OF COMPETENCE BASED CIRRUICULUM (CBC) IN KENYAN UNIVERSITIES: CHALLEGES AND OPPORTUNITIES

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Abstract

The competence based Curriculum adopted by Kenya in 2019 alignsthe country's education system and goals to the global SDG goal No 4 continental (African Economic Outlook, 2012 and regional (East African Community 2013). These global trends dictate that education responds to emerging social, technological and economic demands of the work-place. Curriculum reform is needed to empower our graduates to fit in   a competitive, industrializing and closely networked globalized world (Republic of Kenya 2018a). The Competency Based Curriculum in Kenya under the 2-6-3-3 System of Education puts emphasis on seven core competences, namely; Communication and collaboration, Critical thinking and problem solving, Creativity and imagination, Citizenship, Digital literacy, learning to learn and self-efficacy. It advocates for identification and nurturing of learner's potentials and talents in preparation for life and work.

This paper uses the CBC policy framework to discuss perceived challenges and opportunities likely to arise in Universities during implementation of CBC. The paper adopts a theoretical and conceptual approach in highlighting the policies and strategies for implementation of CBC at the University level. The focus is on pedagogical approaches, assessment in CBC, resource mobilization and management as well as enrollment and gender equity in STEM. Suggestions are given on how universities can prepare adequately for successful implementation of CBC.

Keywords: *Competency Based Curriculum, Curriculum Reforms, Curriculum implementation, Policy Framework*

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CHALLENGES FACING GRADE SIX PIONEER COMPETENCE BASED CURRICULUM CLASS AS THEY TRANSIT TO JUNIOR SECONDARY SCHOOL: A CASE STUDY OF NAKURU NORTH SUBCOUNTY, KENYA

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ABSTRACT

Kenya is in the process of transiting from the8.4.4 education system that got married with the challenges of allegations of producing crammers rather than all round graduates. The Competence Based Curriculum (CBC) that meant to mentor and nature the learners' talents came in handy but has however been marred with a myriad of challenges since its inception in Kenya. The most affected group being the grade six learners that are supposed to transit from primary to junior secondary school. The greatest burden is actually affecting the pioneer grade six learners, teachers and parents. The purpose of this paper was to determine the security on the extent of change of environment and age of learners as they prepare to join the junior secondary schools. The social learning theory was applied to find out the influence peers have on issues concerning education. Data was collected from teachers, parents and grade six learners using questionnaires and interviews. The finding of this study would help the stakeholders, the ministry of education, teachers, and parents make informed decisions on how to tackle issues on security, change of environment, and age since they are pertinent issues affecting education in Kenya.

Keywords: *Transition, Pioneer, Junior Secondary, CBC, Education System.*

KyU is ISO 9001:2015

PRIMARY TEACHER EDUCATION AND KENYA'S VISION 2030: - THE LACUNA IN THE TRANSFORMATION AGENDA

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ABSTRACT

Vision 2030 for the education and training in Kenya is expected to provide a globally competitive quality education, training and research for sustainable development. The content of basic education in the new curriculum has been designed to equip learners with relevant knowledge, skills, competencies and values. However, the major challenge facing the education sector concerns the changing of instructional practices towards greater collaborative relationships between teachers and learners. Teaching and learning are what ultimately make a difference in the mind of the learner, and thus affect knowledge, skills, attitudes and the capacity of young people to contribute to contemporary challenges. Teacher quality remains a major challenge with respect to competence of teacher trainers, curriculum relevance and inadequacy of training resources. The objective of this study was to determine the quality of teacher graduate and the capacity to transform the education system as required in the competence based curriculum (CBC). The study is based on secondary data and reviews of existing literature on the role of teacher trainer in building capacity for teacher trainee to fit the requirement of CBC. The study revealed that much of teacher training programs in Kenya are viewed as being largely unfit for transformative education and are in need of radical reform. Reports from teacher trainers in Kenya indicates that Teacher Education has not kept pace with developments that have occurred throughout in the transformation of education. This fact can be confirmed by the current retraining of fresh graduates back in teacher training colleges by same trainers. The study also revealed a worrying fact in that there is an indication that teachers in the field have little knowledge on how the new curriculum will benefit the Kenyan population differently from the previous system hence making them shy away from serious debates by villagers questioning its validity. New government educational programs like TUSOME, Kenya Primary Education Development (PRIEDE), Strengthening Mathematics and Science Education (SMASE) among others excluded teacher trainers and trainees from their implementation leading to future retraining of teachers who would have been well prepared and informed. This paper recommends that teacher trainees be involved in every process involving curriculum change. It also recommends that the government incorporate teacher trainers and trainees as the mainstream partners in the implementation of the new curriculum and that training must be done by well-informed trainers and its end results must be visualized and conceptualized by the intended consumers in order to realize full educational reforms that is transformative enough for the attainment of vision 2030.

Keywords: *Quality, Implementation, Stakeholders, Curriculum, Transformative, Skills and Primary Teacher Education*.

A META-MODEL OF E-COLLABORATION IN CLASSROOM ORGANIZATION AND CBC LEARNERS PERFORMANCE IN PUBLIC PRIMARY SCHOOLS IN KILIFI COUNTY

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ABSTRACT

Today, developing a holistic individual in terms of positive values is key for any aspiring individual. Previous studied have underscored the need to seek more ways to enhance teaching and learning at the basic level in various environments and Kenya is no exception. This study seeks to identify the influence of e-collaboration in assessment approaches on Competence Based Curriculum (CBC) learners' performance in public schools in Kilifi Sub-County. The study was guided by independent, dependent and moderating variables. Social Constructivist Theory and Traditional Pedagogy formed the theoretical framework of the study. Descriptive research design was used for this study and the target population was 40 Public primary schools in Kilifi Sub-County. Random sampling was used to determine the sample size. Convenience sampling was also used to derive a sample size of 30% to take part in the final study. Self-administered a questionnaire were used to collect data which was then classified, cleaned and analyzed using Statistical Package for Social Sciences(SPSS), (version22.0). Inferential and descriptive statistics were used. Results showed that there was minimal collaboration of teachers from various schools on matters concerning teaching approaches. It was also noted that e-collaboration did not exist in this context for CBC teachers to explore. There is need for e-collaboration and sharing of information by teachers from different primary schools to facilitate diverse approaches to assessment of the CBC learners with the view to boosting the outcomes. It is recommended that e -teams be established to enable CBC teachers share content and teaching approaches so as to strengthen the performance of teachers as well as the learners.

Keywords: - *E-Collaboration, Competence Based Curriculum, Learners' Performance, Public Schools*

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ROLE OF EDUCATION TECHNOLOGY IN INCULCATING ENVIRONMENTAL MANAGEMENT BEHAVIOUR AND MORALS: THE CASE OF KIRINYAGA COUNTY, KENYA

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ABSTRACT

The recent food shortage in Kenya has been associated with harsh environment and changing climatic patterns. According to Titus Masika (2016), the problem could be deeper than just climate change and environmental harshness and may also be abehaviour issue. Masika asserts that many people lack the wisdom to use the limited available resources, the necessary work ethic to entrench conservation and the personal integrity to refrain from unsustainable entrepreneurship. Thus, although all education reforms since 1976 emphasized the need for education to inculcate good morals among the learners, many teachers do not take up the role of mentorship and behaviour seriously. Thus education has been the weak link in matters of management, and is conspicuously absent or silent in promptingbehaviour change. This explorative study sought to investigate the roles played by education institutions in Kirinyaga County to inculcate good morals and behaviour change, related to environmental management, together with motivations for the noted roles played, whether positive, neutral, or negative. This was both an explorative and descriptive study, employing both qualitative and quantitate methods. Data was collected using questionnaires, interview schedules, and observation guides. Leading and key participants were accessed using snow ball technique. Data was analysed and findings presented using narration, graphs, and charts. Results showed that education institutions in Kirinyaga County have not considered environmental management as one of their mandates. It is recommended that environmental management behaviour be adopted by the ministry of education as one of the key emerging issue to be included in the curriculum at primary, secondary, through tertiary and University education.

Keywords: *Behaviour Change, Environment, Conservation, Food, Climate Change, Education.*

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INFLUENCE OF PRINCIPAL'S INNOVATION ON FINANCIAL MANAGEMENT IN SECONDARY SCHOOLS IN MERU COUNTY, KENYA

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ABSTRACT

The principals should be receptive towards incorporating innovative ways of running the operations of their institutions. Their receptivity should be based on methods that minimize costs, save time and promotes excellence. However, there were inadequate financial resources to support use of digital resources in secondary schools. The purpose of the study was to investigate theinfluence of principal's innovation on financial management in secondary schools in Meru County, Kenya. The study used descriptive research to examine a target population of 389 secondary schools. Simple random sampling was used to obtain a sample of 117 secondary schools and purposive sampling method to obtain 117 principals, 117 bursars and 350 head of departments. The study administered two different questionnaires to principals and heads of department respectively. Piloting of research instruments was done in twelve secondary schools in TharakaNithi County. Quantitative data was analysed using descriptive statistics such as frequencies, percentages and meanand correlation analysis used to test the hypothesis. Results showed that digitalization was only used by the management whereas departments prepared departmental budgets manually. This led to slow process of decision making for the principals. There is need for the ministry of education to increase funding to secondary schools to support digitization.

Keywords: *Financial Resources, Digital Resources, Principal's Innovation*

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EXTENDING TECHNOLOGY ADOPTION MODEL TO EXPLAIN USE OF BLENDED LEARNING IN PUBLIC UNIVERSITIES IN KENYA: A CASE OF UNIVERSITY OF ELDORET

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ABSTRACT

Establishing the effect of students' perception on the use of blended learning approaches among Bachelor of Education (B.ED) students in the University of Eldoret was the purpose of this study. The research objectives include: to find out the effect of perceived ease of use on the use blended learning among BED students at the University of Eldoret; and to determine the effect of perceived usefulness on the use of blended learning among BED students at the University of Eldoret. The study was anchored on Technology Acceptance Model (TAM). The philosophy and methodology guiding the study were pragmatism and sequential mixed research design, respectively. Third year students enrolled for bachelors' of education (B.ED) program formed the population of the study. Fifty students participated in the study using conveniency sampling method. Data was collected using structured questionnaires and desk review of relevant literature. Data was analysed using descriptive and inferential statistics techniques by aligning sequentially the quantitative inferences with qualitative inferences alongside findings from desk review. Descriptive statistics revealed that the whole sample perceived blended learning to be useful M=4.6, SD=2.2; though 'not ease to use' M=4.9, SD=2.2. The whole sample willed to use blended learning approach *M=4.2, SD=2.2.* At 95% level of confidence, inferential statistics showed that students perceptions predicted use of blended learning approach, R^2 =.25, *F*(2,45) =9.0, *P*=0.001. Specifically, 'perceived ease of use' did not significantly influence students to use blended learning, but 'perceived usefulness' significantly influenced students usage of blended learning, *t*(45) = 4.12, *P* < 0.05. The study suggests that the university carry out training on blended learning for students at entry and install strong free wi-fi at the campus to address 'perceived ease of use,' among students. Further studies could be done on students in public universities enrolled in different programs other than BED.

Key terms: *Blended Learning; Technology Adoption Model, Perceived Usefulness; Perceived Ease of Use; And Public Universities*

ROLE OF EDUCATIONAL TECHNOLOGY IN BEHAVIOUR CHANGE AMONG STUDENTS IN PRIVATE UNIVERSITIES IN KIAMBU COUNTY, KENYA

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ABSTRACT

Educational technology plays an important role in improving classroom pedagogy in many institutions of higher learning. It enhances sharing of information among lecturers and students and reduces instructional time wastage. However, educational technology has been abused by students leading to behaviour change. Thus, many students get distracted from academic work, rarely concentrate in class but constantly on their mobile phones attending to issues not related to their academic activities. This study sought to assess the extent to which educational technology has influenced behaviour change among students in private universities in Kiambu County, Kenya. The study was guided by the theory of planned behavior and adopted mixed methodology andapplied concurrent triangulation research design. The study targeted 6996 respondents comprising 349 lecturers, 113 Heads of Departments and 6534 students of whom a sample of 379 respondents (30 lecturers, 12 HoDs/CoDs and 337 students) was determined using Yamane's Formula. Qualitative data was analyzed thematically along the objectives and presented in narrative forms. Quantitative data was analyzed descriptively using frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis in Statistical Packages for Social Science (SPSS 23) and presented using tables. The study established that, despite the noble role of technology in improving teaching and learning activities, 56.9% of students in private universities in Kiambu County have witnessed a change in their behaviour. Over 65.8% of the students rarely concentrate in class activities with more than 80.1% constantly using their mobile phones. There is need for students to embrace responsible use of educational technology for their academic benefit and reduce the time spent on non-academic matters. It is further recommended that University management should formulate and enforce ICT policies which restrict use of technology gadgets such as mobile phones during lectures.

Key Words: *Behaviour Change, Educational Technology*

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A CRITICAL ANALYSIS OF 21ST CENTURY STUDENTS LEARNING OUTCOMES FOR EDUCATIONAL REFORMS IN KENYAN UNIVERSITIES

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ABSTRACT

The 21st century student learning outcomes areskills, knowledge and expertise that they should master to succeed in the ever changing global work environment. Through this process the students should demonstrate, Information and Communication Technology Literacy, Critical Thinking/ Problem Solving and Communication skills, Collaborative approaches to solving multisectoral global problems, Global Awareness, Citizenship and efficacy in Self- Management. Thus, whereas, English, mathematics, social studies, and science used to define the educational landscape, the world has changed and the core subjects changed to English, reading or language arts; mathematics; science; foreign languages; civics; government; economics; arts; history; and geography to reflect the demands of 21st century workplaces and communities making a foreign language, economics and geography to be the "new basics". Thus besides the rigorous background students should in addition possess the skills listed above to survive in the ever changing dynamic world and will be assessed on these learning outcomes through their high school tertiary and University education to acquire the required proficiency in the 21st century.

Keywords: *Learning outcomes, Global awareness, Citizenship, Problem solving, Self-management*

RETHINKING THE EFFICACY OF HIGHER EDUCATION REFORMS TOWARDS ENHANCING QUALITY AND ACCESS IN KENYA

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Higher education has been seen as the best vehicle through which the much needed scientific technology and innovation to address contemporary societal challenges can be achieved. This is achieved through building a sufficient reservoir of workforce to spur socioeconomic and political development. The Kenyan higher education landscape has in the recent past been exposed to a number of reforms aimed at streamlining the sector. The purpose of this study is to investigate what these reforms have achieved and whether or not these reforms have enhanced quality and access to higher education for the public good. The study will employ a systematic analysis of public documents and review literature related to higher education reform in Kenya viewed from the perspective of institutional structural and governance reforms, curriculum reforms, quality reforms, funding reforms and growth in institutions offering higher education. These reforms will be analyzed from a perspective of whether they have efficiently addressed the elements of higher education access and provision for the greater Kenyan masses with the ripple effect of producing a workforce to address the twenty first century challenges.

Keywords: *Higher Education, Reforms, Quality, Access, Workforce*

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ENHANCING THE CONTRIBUTION OF HIGHER EDUCATION IN FOURTH INDUSTRIAL REVOLUTION

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ABSTRACT

Global society is changing because of the shifts in technological capacity hence the need for higher education to change. This paper explores the contribution of higher education in the fourth industrial revolution. Thus societal changes dictated the fourth industrial revolution will require higher education to develop a greater capacity for ethical and intercultural understanding, placing a premium on liberal arts-type education with modifications to adapt to demands of the fourth industrial revolution technologies and their disruptions to society. Social and educational transformations from the first three industrial revolutions can provide a starting point in our considering the potential transformations in higher education to support the Fourth Industrial Revolution (4IR). Literature analyzed shows that higher education institutions have a complex, dialectical and exciting opportunity that can potentially transform society for the better. The revolution is powered by artificial intelligence and is expected to transform the workplace from tasks-based characteristics to human-centered characteristics. Therefore, improving the quality of service in higher education can bring about a significant change in society. Secondary data was collected from 35 respondents from higher education institution and a diagnostic test done on study variables which included the test of normality and reliability. The test of normality showed that data was a little skewed and kurtotic and did not differ significantly from normality. Based on the results obtained from the analysis of the study, there is need for more studies to establish unknown factors that align higher education to the fourth industrial revolution. All the independent variables had a positive correlation with the dependent variable. Higher education should deliberately embrace strategies to fourth industrial revolution.

Keywords: *Industrial, Revolution, Institutions, Fourth Industrial Revolution*

USING INDIGENOUS KNOWLEDGE AND EDUCATION TO INFLUENCE AND SHAPE NATIONALLY DETERMINED CONTRIBUTIONS IMPLEMENTATION IN THE FOREST AND LAND-USE SECTOR NEAR MOUNT KENYA FOREST

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ABSTRACT

The world is going through turbulent times due to climate change. The problem is compounded by increasing population in developing countries, exerting pressure on land due to needs for food, water, energy, and pasture, leading to forest degradation and carbon emission. The continued degradation of forests dims the future prospects of sustainable use of forest to achieve human needs notably, local communities and indigenous populations need to take more active roles in preservation of the forests. There has been ironically inadequate participation of indigenous and civil society groups in the REDD+ activities in Africa; making international bodies and organizations the major (and in some instances, the only) actors, thus reducing REDD+ processes to be 'expatriate' and 'foreign knowledge' based (p. 30). One wonders why indigenous knowledge and education has not been sought. The aim of this project is to find out, and support Mount Kenya communities to use indigenous knowledge and education to influence and shape preservation and implementation in the forest and land-use sector through the following specific objectives are 'research on indigenous knowledge of the Mount Kenya communities and indigenous peoples; strengthening available indigenous knowledge and education framework of the Mount Kenya communities and indigenous peoples through capacity building, encouragement and financial support. The study involved research on indigenous knowledge and education that support environmental management around Mount Kenya, and specifically Kirinyaga County. Both qualitative and quantitative methods were used to get primary data; documentary study was used to get secondary information. Results showed. Knowledge of justice systems related to environment; knowledge of forest benefits of species; and sacralization of objects and places; which have been instrumental in forest conservation around Mt Kenya. The study recommends that key stakeholders and local institutions should find ways of adopting and disseminating beneficial indigenous through education and advocacy.

Keywords: *Indigenous Knowledge, Environment, Land, Food, Mount Kenya, Sustainable Development.*

LUGHA NA UVUMBUZI WA KISAYANSI NA KITEKNOLOJIA

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IKISIRI

Uvumbuzi kimsingi huwa unahusisha utambuzi wa vitu, hali na hali aambazo zilikuwapo awali lakini zikawa ama hazijulikani au hazikuwa zimetambuliwa kwa kupewa majina. Utambuzi huu hutumia lugha. Huku nikusema kuwa uvumbuzi niutambulishaji wakitu ambacho hakikujulikana kikajulikana. Ni uwasilishaji wamawazo kupitia uwazaji makinifu. Kwa kuwasilisha mawazo na maoni, wavumbuzi huwa wanatambulisha kitu kwa kutumia lugha. Uwazaji unaotumia lugha huwapa wavumbuzi uwezo wa kufikia taswira za kindani zilizojisetiri kwenye bongo zao. Wanasayansi makini hutumia lugha kuunda upya mawazo na maoni yao upya ili kuenda nana muktadha wa changamoto zinawasukuma kuvumbua. Suala hili huzua mtiririko wamawazo ambao hujengeka kwenye mawazo yao yaawali yaliyokuwa kwenye akilizao. Kwa hivyo ni wazi kwamba ili kufikia maarifa yoyote mapya katika uvumbuzi nisharti kutumia lugha. Kutokana na nafasi kubwa ya lugha katika uvumbuzi, inakisiwa kuwa umadhubutiwa sera ya lugha katika taifa lolote nirutuba ya uvumbzi wa wanasayansi. Katika uchunguzi huu, tunajiuliza, wanasayansi huvumbua chochote kipya au huwa wanatumia lugha kutambulisha jambo, kitu, maarifa au mawazo yaliyokuwapo tayari? Na je, kipi cha msingi zaidi katika uvumbuzi, sayansi au lugha? Ikiwa uvumbuzi huandamana na kuwezeshwan alugha, je mwanasayansi yoyote anapaswa kuitwa mwanaisimu? Na je, sera ya lugha katika mataifa ya Afrika inaathiri uvumbuzi? Maswali haya ndiyo tutashughulikia katikautafiti huu. Uchanganuzi nauhakikiwa nafasi ya lugha katika uvumbuzi wakisayansi na kiteknolojia utafanywa katika utafiti unao kusudiwa. Matokeo ya utafiti huu yatatumiwa kupendekeza kwawashika dau kuimarisha sera ya lugha katika bara la Afrika kama njia ya kuendeleza uvumbuzi.

Istilahi Muhimu: *Lugha, Uvumbuzi, Sera ya lugha, Wanasayansi* na *Wanaisimu*

A COGNITIVE ANALYSIS OF WOMAN METAPHORS IN KIKUYU SECULAR SONGS

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ABSTRACT

The purpose of this paper was to analyze conceptual metaphors of women in the Kikuyu Secular Songs using Conceptual Metaphor Theory (CMT). Metaphors are an essential aspect of human communication and a prominent linguistic feature found in virtually all human languages. However, metaphors are not merely a rhetorical device but a reflection of the working of the human cognitive system depicting different construal and points of view taken by its interpreter. The study employed a qualitative research design. 6 participants were purposively sampled and a corpus of 30 woman metaphors identified in 12songs. Content analysis was used to analyze the metaphors structures by mapping source domains onto target domains. Results showed that in Kikuyu secular songs, women are perceived positively as medicine, star, rib, joy, and gift. However, women are also depicted negatively by comparing them to frogs, plough, colonialist, chameleons and fruitless trees. The aspect of culture is also key in the conceptualization and interpretation of these metaphors.

Keywords: *Metaphors, Cognitive Metaphors, Woman, Kikuyu Secular Songs*

STRATEGIES OF PERSUASION IN DELIBERATIVE DISCOURSE: AN ANALYSIS OF KENYAN PARLIAMENTARY COMMITTEE REPORTS

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ABSTRACT

Parliamentary committee reports emanate from choices and collective decisions on what action to take in response to emerging situations. Because of competing interests, among legislators; parliamentary committee reports (PCRs) require clear strategies of persuasion, in order to unfold their deliberative and persuasive goals. This study analysed the rhetorical appeals used in selected Kenyan parliamentary committee reports advanced to achieve the genre's communicative purpose. The study involved an examination of rhetorical strategies of persuasion used in PCRs including logos, ethos as well as pathos and is premised on Aristotle's Rhetoric art of persuasion theory. Descriptive research design was used with corpora being generated from fifteen parliamentary committee reports sampled five each from selected County Assemblies, the National Assembly and the Senate. Results of this study indicated that different rhetorical appeals are blended and focused on convincing and persuading legislators to adopt PCRs. The findings offer insights on the interplay between deliberative discourse styles, rhetorical persuasive patterns and contribute to the pool of knowledge on genre, communication and rhetorical analysis.

Keywords: *Deliberative discourse, Genre, Parliamentary Committee Reports and Rhetorical Appeals*

RECONFIGURING GENDER AND CULTURAL PRACTICES FOR SUSTAINABLE DEVELOPMENT IN 21ST CENTURY: AN ANALYSIS OF OLE KULET'S BLOSSOMS OF THE SAVANNAH

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ABSTRACT

This paper examined the possibility of redefining and reconfiguring gender roles and cultural practices for sustainable development. Any venture in the realization of sustainable development for 21st century calls for a repositioning of some age-old traditional practices for a better society. Thus societal needs in the contemporary world require active participation of both genders to lay a solid foundation for any development to flourish. The paper points out that the inability of most societies to have gender inclusive structures and a bias of cultural biases work against the realization of sustainable development. Most societies across the globe such as India, Afghanistans, Iranians, and Africans grapple with the question of gender inclusivity embedded and camouflaged in the cultural practices. As a result, structures that entrench inequity and inequality become stumbling blocks to realization of development in the society since age old traditional and cultural practices have a direct influence on the worldview and behaviour of people. This paper pays attention to Ole Kulet's*Blossoms of the savannah* and how it advances the need to address gender and traditional practices as issues that need to be addressed in order to achieve development. The question that arises is: how possible can literary texts address issues pertinent to sustainable development and how can gender inclusivity propel the realization of development in society? Answers to these questions form part of analysis in this paper.

Keywords: *Gender, Sustainable Development, Culture, Traditional Practices, Literary Texts*

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RETHINKING EDUCATIONAL REFORMS: AN INSTRUCTIONAL LANGUAGE REFORM APPROACH

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ABSTRACT

According to the Kenyan Policy document released in 2018, one of the key challenges facing individuals with hearing impairment is language. The document indicates that few individuals in Kenya use Kenyan Sign Language to communicate or are unaware of it hence limiting their participation in social events and everyday life. There is therefore, need to reduce or do away with such communication barrier. However, the numerous approaches employed in enabling hearing-impaired individuals are solely based on the idea of making them "normal". That is trying as much as possible to make them learn how to speak and lip read. This process is strenuous and yields little outcome compared, to the input. This study seeks to determine the percentage, of the Kenyan population living with hearing impairment and the factors hindering the hearing impaired from acquiring proper education, and identify the possible solutions. The study adopted internet-based research methodology preliminary findings indicated that, the education of the hearing impaired in Kenya is insufficient, thus making a majority of them unable to integrate into the larger society, thereby, limiting their participation in social events, and in workplaces. There is need to advance strategies to minimize these barriers on the hearing impaired as well as the other learners.

Keywords: *Hearing Impairment, Language, Sign Language, Communication, Hearing-Impaired*

MORAL EDUCATION IN KENYAN SCHOOLS AT CROSS ROADS. ISN'T IT TIME TO INTRODUCE A STAND-ALONE MORAL EDUCATION CURRICULUM?

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ABSTRACT

One of Kenya's national goals of education is to promote sound moral and religious values in the learners. While moral values have an intrinsic good of helping students grow up into responsible adults capable of enjoying a good life, there is a clear moral deterioration among the Kenyan youth. A number of people are thus wondering where the youth are heading. This is because cases of drug abuse, alcoholism, violence, theft, teenage pregnancies, rape and suicide are being the cases reported almost daily in the media. It is quite evident that something is wrong with the value systems of our youth. Moral education has been entrusted to the school. However, it is possible that the school syllabi do not contain requisite elements that could enable learners to develop the needed moral insights. Since independence moral education has been taught using religious education subjects namely Christian Religious Education (CRE), Islamic Religious education (IRE) and Hindu Religious education (HRE) as well as Social Education and Ethics (SEE). But in spite of the existence of these subjects in the curriculum, moral standards among the youth have remained low. It seems that the teaching of moral goals of education through religious education subjects has not achieved the intended objective. This paper presents a discussion on the need to develop a stand-alone moral education curriculum with clear objectives in the Kenyan school curriculum.

Keywords: *School Curriculum, Moral Education, Morality, Social Ills, Values.*

IMPROVEMENT OF THE QUALITY OF DOCTORAL PROGRAMMES FOR THE PRODUCTION OF BETTER THINKERS AND PROBLEM SOLVERS FOR TOMORROW IN KENYA

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ABSTRACT

The purpose of this study was to investigate ways of improving the quality of doctoral degree programmes with a view to producing better thinkers and problem solvers for tomorrow in Kenya. The concern for the quality of doctoral education has attracted attention of policy makers, researchers, experts in educational sector and other relevant stakeholders globally. For example, the number of graduates holding doctoral degrees has tremendously risen and the rapid expansion has raised concerns on the quality of graduates. Universities globally are facing huge challenges in facilitating postgraduate education due to diminishing funding and increased institutional scrutiny by the public and established commissions as well as the introduction of part-time study raising concerns of quality of teaching and learning. One of the key issues concerning the quality of doctoral programmes and graduates is research. Thus, questions have been raised about the quality of research supervision of the doctoral students. Worldwide, and mostly in sub-Saharan African universities there is still inadequate number of qualified lecturers especially holders of Doctoral Qualifications and professors. Thus, the inadequacy of qualified lecturers and diminutive training of supervisors have training compulsory to enhance the quality of the doctoral programme and consequently that of the graduates. The guiding objectives will be, to: investigate ways of improving the quality of doctoral programmes for the production of better thinkers and problem solvers in Kenya, b) determine reasons for poor quality of doctoral programmes in Kenyan universities, c) evaluate strategies for improving doctoral programmes in Kenya for better graduates for tomorrow. This is a descriptive study; data will be collected using a standardized questionnaire to study Deputy Vice Chancellors from selected universities in Nairobi City.

Keywords: *Kenyan Higher Education, Quality Doctoral Supervision and Training, Collaboration, Admission Criteria for Doctoral Students, Contracts, Research Capacity Building*

LEARNER PERSONALITY CONSIDERATIONS IN LEARNING ANALYTICS: A PROPOSAL

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ABSTRACT

Learning analytics processes tend to focus on the learner from a general perspective, with little or no consideration for their personality. Learner personality characteristics have been proved in recent studies to be a vital aspect of learning interventions. There is need for researchers to consider inclusion of learner analytics and personality characteristics data in order to truly create a supportive, personalized education system.

Keywords - *Learning Analytics, Personality, Analytic Implementations*

USING EDUCATIONAL TECHNOLOGY IN TEACHING AND LEARNING IN UNIVERSITIES IN KENYA: IS IT A BLESSING OR A CURSE

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ABSTRACT

From Mid-20th Century through the 21st Century, modern technology has been blossoming rapidly in Kenya. At this moment, the Education system has incorporated Technology aiming to achieve its objectives. Most of the teachers and students in Secondary schools and Universities spend more time using Technology. The increase in use of Technology in Kenya has led some scholars to question how it enhances teaching and learning in universities, and what benefits it has both parties in the educational context? And how blessed or cursed it is to students. The goal of this paper is to review the literature related to the use of technology in University education in Kenya to determine whether it has been a blessing or a Curse. The paper is divided into three parts. The first part looks at the Definition of Technology and Educational Technology and proceeds to describe how it is being used in Kenyan Universities. The second part explores the advantages that educational technology has for teaching and learning- the blessings. Part three discuses various negative effects of Educational Technology- Curses. The findings incorporate all types of learners. It covers all styles of teaching and learning; including long distance learning. On the other hand, it is of curse to educational system, because it has encouraged laziness, misguidance, and dependency on it among learners. The paper presents suggestions on how educational Technology can become a blessing in the teaching and learning processes.

Keywords: *Technology, Educational technology, blessing, curses.*

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INTEGRATION OF GENDER EQUALITY BEST PRACTICES IN TVET INSTITUTIONS: A CASE STUDY OF NYANDARUA NATIONAL POLYTECHNIC, KENYA.

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ABSTRACT

The study sought to assess the Integration of Gender equality best practices in Technical and Vocational Education and Training -TVET at Nyandarua National Polytechnic, Kenya. Attempts by individual TVET institutions to incorporate gender equalityincludeestablishinggendercenters, affirmative action and enhancing women's participation in engineering related courses. However, there is hardly any data on the integration of gender-responsive training, the status of gender financing and establishment of gender responsive environment. The objective of the study was to analyze the integration of gender-responsive training at TVET Institution using a case study of Nyandarua National Polytechnic, Nyandarua County, Kenya using **q**uantitative research design. A census of all teaching staff, HODs, and the administrative staff was done comprising 125 respondents. The relationship between the variables was established through correlation analysis using regression analysis and ANOVA 65% agreed that gender responsive training is important, 25% strongly agreed, 5% strongly disagreed, 4% disagreed and only 1% were neutral, 51% agreed that institutions require gender financing, 48% strongly while only 1% strongly disagreed 47% agreed that institutions required gender sensitive facilities, 35% strongly agreed, 10% strongly disagreed and 6% agreed. Only 2% were neutral. It is advisable that Nyandarua National Polytechnic considers integrating gender-responsive in its training to increase gender equality.

Key Words; *Gender, Gender equality, Gender responsive Training*

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THE IDEATIC THEORY OF RELIGION: FORMULATING A NEW THEORY FOR RELIGION

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ABSTRACT
The focus of this study is the need for reformulation of the theory of religion. This task is necessitated by the apparent inadequacy in the existing theories. Religion is complex and its theory requires addressing two important aspects' that is how religion originated and how it has continued to maintain and preserve its presence to present time. Many of the current theories address either one or the other thus lacking a theory that addresses the aspect of religion in its pluriform and multi-faceted manifestation. This presentation covers the underpinning theories of Hegel and Albert Einstein, the cultural context of individual and personal sociality, classical and contemporary theories and a discussion on the proposed theory of ideatics for the origin, development and evolution of religion.

Keywords: - *Dialectic, Ideatic, Relativism*

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SCIENCE TECHNOLOGY AND INNOVATION FOR SUSTAINABLE DEVELOPMENT IN KENYA: IMPLEMENTATION OF LEGAL AND POLICY MECHANISMS

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ABSTRACT

The study examines adequacy of legislative and policy frameworks to support application of science, technology and innovation geared to achieving sustainable development in Kenya. Prior to the enactment of the Science Technology and Innovation Act 2013, the legislative framework facilitating the growth of research and innovations was contained in the Science and Technology Act. The Science and Technology Actthat al coordination of research activities through the National Council on Science and Technology. However, the Act had a number of gaps in terms of; lack of elaborate facilitative mechanisms, ineffective implementation framework, overall lack of coordinated regulation of the sector. The Science Technology and Innovation Act was enacted in 2013, to address the inadequacies in the law and for further institutionalization of innovation as an important component of research and development. This study therefore seeks to answer the questions: Has the enactment of the Science Technology and Innovation Act and regulations facilitated the growth of activities in science, technology and innovation? To what extent has the legal and policy framework on Science Technology and Innovation (STI) enhanced governmental development agenda with a specific focus on sustainable development. Data was collected through documentary review and informal interviews. Preliminary findings reveal that eight years into the implementation of the Science Technology and Innovation Act, there has been commendable progress in the facilitation of the development of ST&I and increased funding of STI activities to academia and National research institutions. However, a number of gaps exist in the implementation of statutory stipulations, funding and linkage between ST&I and national development and sustainable developmental goals remain low. Thus, although Science Technology and Innovation Act provides much more strengthened legal framework for promotion and regulation of ST&I activities, existing gaps in implementation hinder achievement of the objectives.

Keywords: - *Science, Technology, Innovation, Legal Framework, Policy, Big Four Agenda, Sustainable Development Goals*

PSYCHO-SOCIAL SUPPORT TO CHILDREN INFESTED BY JIGGER IN KISII COUNTY: SOCIAL WORK PERSPECTIVE.

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ABSTRACT

Social workers are key to assessment of social care needs and provision of psychosocial support. Jigger infiltration containment and control when not well managed affects the victim's quality of life through localization in the foot causing walking difficulties of the infested person. Both social and psychological problems such as low self-esteem and stigma have been observed in children infested with jiggers. This study investigated the role of a social workers in prevention of jigger infestation among children in Kisii County. The study used a descriptive survey design. The sample size was 50 pupils, 50 parents,20 Key Informants and 20 practicing Social workers. Results showed that in order to mitigate Tungiasis, the risk factors that contribute to their spread such as poverty, poor hygiene conditions, area sanitization, inadequate health facilities, sharing houses with domestic animals, should be addressed. Social work practitioners should thus engage with children to assess challenges in social functioning, process information in ways that enhance their ability to maintain body hygiene, develop skills to curb tungiasis and create support for change. There is need for behaviour change in the community and to avoid superstitious perception on the causes of Tungiasis.

Keywords: *Tungiasis, Social worker, Psychological problem, Stigma, Low Self-esteem.*

KyU is ISO 9001:2015

INFLUENCE OF INSTRUCTIONAL METHODS ON GIRLS' PERFORMANCE IN KCSE MATHEMATICS IN BARINGO CENTRAL SUB COUNTY, KENYA

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ABSTRACT

Mathematics is an important subject to achievement of Vision 2030 in Kenya. Unfortunately, girls' performance in Mathematics has remained dismal over the years at the secondary school level. Such consistent underperformance is attributed to factors like teaching approaches. This paper examines the extent to which instructional methods used in teaching influence girls' performance in Mathematics in KCSE in Baringo Central Sub-County. The study was guided by the systems approach to teaching and learning developed by Ayot and Patel. The study was carried out through descriptive survey research design. A sample size of 190 subjects was used. It comprised of 18 Mathematics trainers, 6 Mathematics Heads of departments and 166 girls. Purposive sampling was used to select HoDs and Mathematics teachers while simple random sampling was used to select the Form Four girls. Two questionnaires, one for Mathematics teachers and the other for students namely interview schedules for Mathematics HODs and observation checklist were used during data collection. Data was analysed using descriptive statistical techniques like standard deviation, percentages, frequency tables and means. Results indicate that instructional methods have an influence on girls' performance in mathematics. The teachers approach to teaching mathematics impacts on the way pupils apply, analyse, and synthesize concepts to create knowledge and solve problems. Teaching methods had a low but significant influence ((r=0.210) $p<0.05$) on girls' performance in KCSE Mathematics examinations. We recommend that teachers should be given more in-service training in Mathematics to improve performance in mathematics.

Keywords: *Instructional Methods, Teachers, Teaching mathematics, Secondary Schools, Baringo central Subcounty, Kenya*

THE LEVEL OF STUDENTS' SELF-EFFICACY ON E- LEARNING AT POST-COVID-19 PANDEMIC: CASE STUDY OF RONGO UNIVERSITY-KENYA

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ABSTRACT

COVID-19 led to numerous deaths and global spread required not only national-level responses but also active compliance with individual-level prevention measures outside and within the institutions of higher learning. It required individual self-efficacy means individuals' confidence and certainty in their ability to successfully perform specific health-related behaviors to limit COVID-19. This study used Rongo University in Kenya to determine the level of students' self-efficacy on E- learning during the COVID-19 Pandemic. Like many other Universities in Kenya, Rongo University was ill prepared to engage in e-learning due to infrastructural deficiency and lack of preparedness among the lecturers. There is need for sustained investment in ICT infrastructure and training of lecturers to support e-learning in all institutions.

Keywords: *Students' Self-Efficacy, E-Learning, Pandemic, COVID-19*

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DRUG AND SUBSTANCE ABUSE MANAGEMENT APPROACHES AND ACADEMIC PERFORMANCE IN SECONDARY SCHOOL STUDENTS IN EMBU AND THARAKANITHI COUNTIES, KENYA

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ABSTRACT

Drug and Substance Abuse (DSA) has become a concern all over the world especially among the adolescents. Many young people between the ages of thirteen to seventeen years in the world have experimented on a particular drug. Forty thousand people die annually from drug-related complications in Africa. The highest percentage of adolescents abusing drugs and substances in Tanzania is between 13-15 years of age while the vice is rampant among secondary school students in Kenya. Diverse drug and substance abuse management (DSAM) approaches have been put in place to mitigate drug and substance abuse menace among secondary school students in Kenya. Guidance and counseling approaches which include peer counseling and talks from professionals is among the methods utilized to manage drug and substance abuse among secondary school students. The study was a descriptive survey seeking to explore the relationship between guidance and counselling as a drug and substance abuse management approach and the students' academic performance in secondary schools in Embu and TharakaNithi Counties. The target population was 85,040 comprising of students, heads of guidance and counseling departments and school principals. A sample of 896 respondents was drawn comprising of 768 students, 64 heads of guidance and counseling departments and 64 principals. Stratified random sampling was used to select the schools while simple random sampling was used to select 384 form two students to participate in the study. Purposive sampling was used to select the heads of guidance and counseling departments and the principals. Questionnaire, document analysis, interviews and observations were used to collect both quantitative and qualitative data. Descriptive statistics included frequency distributions, means and percentages of the data whileinferential statistics was linear regression by the help of Statistical Package for Social Sciences (SPSS) version 21. Qualitative data was analyzed by identification of the themes and patterns of meaning across the data in relation to the research questions. Regression analysis revealed statistical significant relationship between guidance and counseling as a DSA management approach and students' academic performance. An improvement in guidance and counseling as a DSAM approach improved the academic performance by 10.62%. It is therefore advisable for school stakeholders to strengthen guidance and counseling as a tool to mitigate DSA among learners for better academic performance.

Keywords*: Guidance and counseling, Drug and substance abuse, Drug and substance abuse management, academic performance*

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EFFECT OF TECHNOLOGY ON STUDENT'S BEHAVIOUR IN UNIVERSITIES IN KENYA

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ABSTRACT

Technology is part of human day-to-day life, and education sector is no exception. Thus, teaching and learning have become digitalized. We live in a digital World of Technology and are part of the Net Generation hence use of Technology cannot be ignored, since it has become part of human life, with a high percentage of the people using smart phones and computers in their daily lives. Studentsin universities use technology toacquire and receive information, do research, undertake assignments and University expenditures do online business and kill boredom.

Behaviour is a way in which human beings acts or have response to a particular stimulus. Behaviour change takes place in the physical, mental and social phases of human life from infancy, childhood, adolescence and adulthood. In this paper we focus on the effect of technology on students' behaviour in Kenyan universities. The paper is based on a theoretical review of the literature. We start with a conceptual definition of technology in education then define behaviour change and discuss the use of technology in universities in Kenya and its effects on the behaviour of students. The change in behaviour is discussed with reference to teaching and learning, academic integrity academic performance and social interaction. We highlight the positive and negative effects of technology on student behaviour and make suggestions on how technology can be used in universities for positive behaviour change among students

Keywords: _Technology, Universities, Students, Behaviour Change_

KyU is ISO 9001:2015

PROSPECTS OF ONLINE AND MOBILE LEARNING METHODS AS VIABLE EDUCATIONAL REFORMS AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

This study investigates the potential of using online and mobile learning platforms as part of educational reforms in promoting sustainable development. The study assesses the possibilities of online and mobile learning methods, like e-learning, m-learning, and blended learning, in revolutionizing educational delivery in Africa. It examines the challenges associated with traditional education systems in achieving the Sustainable Development Goals (SDGs), such as inadequate access to quality education, lack of access to educational resources, and low student engagement within the Sub-Saharan nations. The importance of educational reforms to promoting sustainable development, and the benefits of online and mobile learning methods to educational growth are discussed and the prospects of implementing online and mobile learning platforms and the opportunities they present in improving access to quality and resourceful education explored.The study adopts qualitative research methods, to review the existing literature and strengthen the potential of using online and mobile learning methods towards achieving educational reforms and sustainable development. The study further considers the effectiveness and impact of these methods on the environment and their ability in reducing carbon footprintsand underscores the relevance of online and mobile methods as viable tools for educational reforms and sustainable development in Africa.

Keywords: *Educational Reforms, Online and Mobile learning platforms, Sustainable Development, Qualitative Research.*

INVESTIGATING THE ROLE OF EDUCATIONAL TECHNOLOGY IN BEHAVIOUR CHANGE

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ABSTRACT

The contemporary study suggests that for the perceived change of behavior due to technology, one has to use it regularly. The study focusses on impact of technology to students and personnel in various levels of education and exposes the behavioral changes due to integration of educational technology. Apparently, integration of educational technology has brought about both pedagogical and behavioral changes desirable to the education systems. Technology is thus used to ameliorate learning. However, there is unequal access to technological achievements. Thus, not all schools have trained ICT teachers hence the different set of behaviors. This paper will explore the disparity between the technological advancement and behavioral reasons for the lack of universal technological behavioral changes and the reason for low competency in technological issues. Due to technology, motivation is enhanced, students look forward to the next lesson, learning becomes exciting, efficiency and effectiveness in increased, performance and research are enhanced and it helps the users to understand the world better. Above all, technology gives a purpose for living. Qualitative research is to be used to explore the behavior changes due to technology. Both interviews and questionnaires will be the tools used to expose the benefits of technology in schools. The overarching conclusion will expound the link between educational technology and behavioral changes and how technology can be incorporated into everyday classroom practice.

Keywords: _Change of Behavior, Technology, Pedagogical, Technological Advancement_

ACADEMIC INTEGRITY IN KENYA UNIVERSITIES: USING THE PRISONER'S DILEMMA TO DEVELOP POSITIVE INTERVENTIONS

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ABSTRACT

This paper explores unethical practices in universities in Kenya, showing the challenges they pose to academic integrity. There has been a rapid expansion of university education in Kenya, even though demand for higher education has plateaued in recent years. The number of qualified students seeking to join private universities, and associated tuition revenue, has declined significantly since 2017 when cheating in high school examinations was eradicated. Some universities have resorted to unethical practices to enroll students and offer programs that have not been accredited by the Commission for University Education (CUE). There is also a growing concern among governments, educators, students, and other stakeholders that unethical practices in higher education is spreading quickly and compromising the integrity of academic programs.

The paper proposes that strategies can be put in place to enhance academic integrity. It does this by considering why individuals act unethically, even though doing so contributes to damaging the credibility of the sector. The idea of the prisoner's dilemma is introduced to explain why it remains in individuals' interest to act in this way. Based on this, we suggest that changes be made to shift the balance of risk and reward. These changes can include efforts to detect unethical behaviour; discourage it through more consistent penalties; and to encourage and reward positive alternatives. We propose that everyone in Higher Education could contribute to these changes, suggesting interventions that could be made by teachers in classrooms; by trainers within universities; and by policy makes nationally.

Keywords: - *Unethical Practices, Academic Integrity, Credibility, CUE*

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SUBTHEME THREE: - ENGINEERING, TECHNOLOGY AND DESIGN

THEORETICAL TESTING FOR DISPERSION IN TRANSVERSELY AND LONGITUDINALLY VIBRATING BEAMS OF SHORT, RANDOMLY ORIENTED GLASS FIBRE REINFORCED DOUGH AND SHEET MOULDING COMPOUNDS

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ABSTRACT

Amongst the various methods used to characterise the elastic properties of materials are the transverse and longitudinal vibration tests. The two methods rely on the transmission of elastic waves in a material to induce vibrations in it whose characteristics yield the required elastic properties. The methods assume heterogeneity and homogeneity of the tested materials and therefore elastic properties that are also heterogeneous and homogenous. The presence of discontinuities in materials that are significant in size relative to the wavelength of the transmitted elastic waves, distorts the waves in what is referred to as dispersion. Therefore, it is necessary to determine the significance of dispersion in materials, in this case Dough Moulding Compounds and Sheet Moulding Compounds prior to embarking on such testing. This is achieved in this paper by developing analytical formulae and using these against know dimensions of the reinforcing fibres in each type of composite, this being the largest discontinuity in these materials. The results arising from the theoretical analysis in this work show the effects of dispersion to be negligible for both composites for transverse vibrations and all orientations of the reinforcing fibres. However, the same is not the case for all orientations of the reinforcing fibres for longitudinal vibrations, which underscores the need to carry out such analysis prior to embarking on expensive build of specimens and testing.

Keywords: *Dispersion, Elastic Waves, Transverse and Longitudinal Vibrations, SMC and DMC*

KyU is ISO 9001:2015

ENERGY EFFICIENT BUILDINGS FOR BIOSPHERE'S SUSTAINABILITY

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ABSTRACT

For decades now, planet's biosphere sustainability is at stake due to human, social, economic and environmental factors that have negatively impacted the earth we live in. With global warming and greenhouse gas emissions on the rise, there is every need to worry. Climate change today has a significant impact on almost every aspect of our environment, economies, societies and the planet's biosphere that is under immense threat of extinction. The building sector is a key contributor of carbon dioxide emissions in the world today. To limit production of greenhouse gases from the building industry and other negative impacts to safer levels is a big challenge today and should be addressed quickly and decisively. Luckily, (ICT) technologies can be used to mitigate carbon dioxide emissions and adverse effects of climatic change effects that already exist. The purpose of this research is to review the nexus of Internet of Things innovations to deliver Net Zero energy buildings (NZEBs) that can mitigate global warming for a sustainable biosphere. This will help achieve favourable energy efficiency to mitigate against the adverse climatic upheavals due to increased global warming. The specific objectives of the study are: to examine the gravity of emissions from non-energy efficient buildings and the extent to which they contribute to global warming, explore the components and capabilities of IoT technology and infrastructure that influences the design of internet of things, determine ways of integrating machine learning (ML) and artificial intelligence (AI) technologies to reconstruct past climate events and improve future predictions. The research fronts a future of global energy efficiency for a sustainable biosphere through mass implementation of Internet of Things and M2M energy efficient buildings technology.

Keywords: *Application Enabling Platforms, Carbon Emission, Energy Efficiency, Global Warming, Machine to Machine, Net Zero Energy Buildings and Smart Buildings*

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EXTRACTION AND ANALYSIS OF PHENOLIC COMPOUNDS IN COFFEE CHERRY PULP AND THEIR UTILIZATION IN PRODUCTION OF RESINOID BOND FOR ABRASIVE MACHINING WHEELS.

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ABSTRACT
Industrial growth and expansion in the manufacturing sector continuously create an equal demand for raw materials and other consumables. A promising strategy to sustain this cause– effect at equilibrium is application of industrial biotechnology in utilizing agro-processing by products, otherwise regarded as wastes, where applicable. Considering the huge mass of cherry pulp generated during wet processing of coffee-value chain, this research seeks to study and analyze the phenol compounds contained in coffee cherry pulp with an objective to substituting the industrial phenols from *cumene* used in production of phenolic resins. Preliminary findings show that the main phenolic compounds present in coffee are those derived from hydroxyl cinnamic acids takingabout11.3% dry coffee bean weight. Organic solvent extraction method will be used in phenols extraction followed by chemical procedures to analyze their chemical properties. Characterization will be done for potential use in phenol-formalde hyderes in production. The use of coffee industrial residues in resins production is an economical solution to agro-processing wastes management as well as a sustainable development in the manufacture of different types of abrasive tools including bonded wheels, coated belts and non-woven abrasives.

Keywords: *Abrasive Machining, Coffee Cherry Pulp, Biotechnology Process, Phenols, Resinoid Bond.*

KyU is ISO 9001:2015

SOLAR RADIATION MODELS FOR PREDICTING AND MAXIMUM CAPACITY OF SOLAR MILK COOLING REFRIGERATION SYSTEM FOR IN A SITE

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ABSTRACT

Solar energy needed to drive solar-driven milk refrigeration systems is only abundant in the mid hours of the day and is completely unavailable in the early and late hours of the day. The mismatch between solar energy availability and the milk cooling load energy demands and intermittent availability of solar energy negates application of solar-driven milk cooling refrigeration systems. It is thus prudent to harness and store solar energy during peak periods of high solar energy for milk cooling during low or insufficient solar energy availability. This study has analyzed solar energy predicting models from literature reviews and annual solar energy trends from different sites and selected a solar radiation prediction model for predicting mean daily solar radiation levels. The input parameters considered are readily available in most meteorological stations in remote regions. Performance of four mean daily solar radiation prediction models namely; Gadiwala (MI), Seme (M2), Sendanayake (M3) and Samani (M4) when compared with measured data in Nakuru indicated a strong correlation of coefficient R^2 of 0.826, 0.735, 0.810 and 0.760 respectively. Three refrigeration systems with AC reciprocating compressor capacities of; 200 W, 250 W and 350 W were investigated for maximum cooling loads in varying mean daily solar radiations. Equal amounts of water stored in milk cans were surrounded with an ice layer, followed with an outer brine solution, which was then insulated by a polystyrene jacket. In each system, water in the milk can was cooled by an evaporator submerged in the brine solution, forming a layer of ice surrounding the milk cans. Four PV panels, each of 200 Wp, connected via an inverter provided the power required to operate the compressors in each refrigeration system. Temperature variation of the water in the milk cans and the amount of ice formed were used to determine the solar driven refrigeration system with maximum cooling load, based on solar radiation available. The cooling curve obtained in each refrigeration system provided nonlinear regression mathematical models for predicting maximum cooling loads for the solar-driven refrigeration systems. The coefficient of correlation R^2 between the actual and predicted maximum cooling loads for the 200W, 250W and the 350W solar refrigeration systems were 0.8647, 0.9413 and 0.956 respectively. An accurate model for predicting the solar-driven refrigeration capacity of a milk cooling system with the provision of sensible thermal energy storage for matching solar energy availability and milk cooling load energy demands at any site could be a useful tool for optimization in the design and application of solar-driven milk cooling refrigeration systems. Designers and manufacturers of solar-powered milk cooling systems for large, medium and small businesses would find the solar driven refrigeration maximum cooling models load a suitable tool.

Keywords: - *Solar Radiation Model, Gadiwala (MI), Seme (M2), Sendanayake (M3) and Samani (M4)*

CASES OF AND THE EFFECTS OF DIFFERENT STRAIN RATES ON THE DEFORMATION-BEHAVIOUR AND MICROSTRUCTURE OF TI6AL4V AND OTHER METALLICS

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ABSTRACT

Over the last seventy years, the titanium alloy Ti6Al4V has continued to gain utility in the aerospace, biomedical and automotive industries. This growth in it use has been driven by its good specific properties of strength stiffness, hardness, and fatigue resistance in comparison to the traditional materials of steel and aluminium. Its biocompatibility and good corrosion resistance have also worked to its advantage. Today a lot of research and development of products is aimed at producing Ti6Al4V and other metallics parts based on the additive manufacturing technologies, primarily laser powder bed fusion (LPBF). The LPBF technology comes with the advantage of minimal or no wastage of materials, ability to produce complex shapes and subassemblies at one go and high resolutions of manufacture to a micron scale. The high cost of the technology, however, does limit mass production of parts and the technology is rather focused on the manufacture of high value components and prototypes with complex geometries in most cases. In order to expand use of the alloy in industry, tests have been conducted to characterise its mechanical properties over the years, principally its quasi-static properties. However, recent work has explored the behaviour of Ti6Al4V and other metallics under conditions dynamic, and high strain rates, the latter which are known to occur in cases such as bird strikes and fan blade out in aircraft, as well as in use of ballistics. As a continuation of this emerging focus, this paper explores the manner in which different strain rates affect the deformation-behaviour and microstructure of Ti6Al4V and other metallics and provides details of real life applications and occurrences of such strain rates.

Keywords: *High Strain Rate, High Velocity Impact, Melt Pool Modelling, In Situ Alloying*

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Π PHASE-SHIFT FABRICATION OF FIBER BRAGG GRATING BY POST-PROCESSING USING FEMTOSECOND LASER

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ABSTRACT

Fabricating of phase-shifted fiber Bragg grating (PSFBG) by a femtosecond (fs) laser post-processing of standard single mode fiber Bragg grating (FBG) without phase mask is demonstrated. A central region of grating is irradiated by an fs laser assisted with a rotating jig, which produces a π phase shift at the central region of the grating and forms a π phase-shifted FBG. The procedure is simple, fast, and has good reproductivity. The bandwidth of transmission peak of PSFBG grows with increasing amount of laser energy or length of irradiation and decreasing translation speed. Transmission loss decreases with increasing irradiation length. Repeatability of fs post-processing and temperature stability of PSFBG were investigated.

Keywords: *Phase-Shifted Fiber Bragg Grating, Femtosecond, FS Laser, Rotating Jig*

KyU is ISO 9001:2015

THE POTENTIAL OF CELLOPHANE SHEET AS A CHEAP OPTICAL RETARDER

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ABSTRACT

Birefringence is an inherent optical property of anisotropic materials that enables manipulation of polarization state of light beams for various photonic and optoelectronic applications. In this work, we demonstrate the ability of the cellophane sheet to act as a phase retarder. Results show that the cellophane introduces a phase shift of 0.98π radians on the incident beam. By rotating the cellophane sheet on the object beam, the fringe separation is measured for different angles and the values used to calculate the ordinary and extraordinary refractive indices as 1.4721 ± 0.0002 and 1.4680 ± 0.0002 respectively. Because of its sufficient birefringence and small thickness of 24 μm, cellophane can be used to fabricate special polarization pupil masks by cutting and aligning different cellophane structures appropriately.

Keywords: - *Birefringence, Cellophane Sheet, Phase Retarder*

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RESEARCH ON ULTRASONIC VIBRATION AIDED FEMTOSECOND LASER MACHINING PROCESS OF TRANSPARENT MATERIALS

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ABSTRACT

A new process of femtosecond laser micromachining with ultrasonic vibration aided devise is proposed. An ultrasonic aided device has been designed, and the laser micromachining experiments of transparent materials have been carried out. The effects of the ultrasonic vibration with different power on surface quality and the drilling depth were investigated, and the mechanism of the ultrasonic vibration aided laser machining analyzed. After introducing the ultrasonic vibration device, the residue debris on surface of the ablated trench is significantly reduced, and the drilling depth is increased. These results show that, ultrasonic vibration can effectively improve the surface quality of material processing, increase the depth of the drilling hole and promote the processing efficiency of the femtosecond laser.

Keywords: *Femtosecond Laser Micromachining, Ultrasonic Vibration, Surface Quality*

KyU is ISO 9001:2015

POLARIZATION EFFECT IN PHASE HOLOGRAMS

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ABSTRACT

Holography has a wide application in medicine, optical computers and scanners among others. Conventional studies on analogue holograms have mainly been conducted on image generation, processing and reconstruction. However, these conditions may vary thus affecting hologram quality. Since convection holography use photosensitive recording interference patterns in holographic material, there is need to evaluate aberration or how high intensity of light has been reconstructed. In this paper, we analyzed the fundamental parameters such as exposure time and processing chemical composition effect in phase holograms. Optimization of these parameters resulted to phase hologram image of approximately 16% diffraction efficiency at an exposure time of 20s. The influence of objective beam polarization is investigated. Results showed that by varying the polarization orientation, diffraction efficiency and fringe visibility are greatly affected.

Keywords: - *Holography, High Intensity of Light, Exposure Time, Processing Chemical Composition Effect, Holograms*

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THE EFFECT OF SOAKING TEMPERATURE ON THE MICROSTRUCTURES OF ADDITIVELY MANUFACTURED STRESS RELIEVED, AS WELL AS STRESS RELIEVED AND HIGH TEMPERATURE ANNEALED Ti6Al4V(ELI)

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ABSTRACT

The stability of microstructure at high temperatures is necessary for many applications. This paper presents investigations on the effect of changes in temperature on the microstructures of additively manufactured Ti6Al4V(ELI) alloy, as a prelude to high temperature fatigue testing of the material. In the present study, a Direct Metal Laser Sintering (DMLS) EOSINT M290 was used to additively manufacture test samples. Produced samples were stress relieved and half of these were then annealed at high temperatures. The samples were then heated from room temperature to various temperatures (133, 241 and 349 °C), held there for three hours and thereafter, cooled slowly in the air to room temperature. Metallographic samples were prepared for the examination of their microstructures. The obtained results showed little change in the microstructure of the alloy exposed to the different soaking temperatures below 350 °C. Testing for hardness showed insignificant changes of hardness of the various specimens soaked at different temperature below 350 °C. It is concluded in the paper that the elevated temperature below 350 °C, at which fatigue testing is intended to be carried out, should not have significant effects on the fatigue properties of the alloy.

Keywords: - *Microstructures, Additively Manufactured, Alloy, Direct Metal Laser Sintering*

KyU is ISO 9001:2015

USING GRAVITY, MAGNETIC FORCE, WIND AND INTERNALLY GENERATED ELECTRICITY TO MAKE A MOVING MACHINE

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ABSTRACT

High cost in transportation is among the challenges faced by human beings. Fuel is applied repeatedly to avoid vehicle stopping. This study develops a project where issues of when and how to supply the machine with fuel is addressed. Gravity, magnetic force, wind and electricity generated within the machine are some of the things to use in the engine of this machine. Engine will be connected in such a way that we will have two or more pairs of heavy two metals or magnetic materials. This material will be of equal weight and opposite distance from a given point. Metals will be fixed will balance. Additional magnetic forces will make these metals to start rotating. The magnet will be sealed in such a way that it will not attract other materials. Two magnets will be fixed on circumference made by rotating metal but they will be touching to pull or push the metal enhancing movement. Since there will be two or more such pair movement of the vehicle will be achieved. We will then connect the center of the two metals with an item like a windmill that will increase the speed as speed of wind increases hence enhancing the movement of this machine. Since there is magnet and moving parts, electricity will also be generated giving the machine sufficient power to move. These forces will make the vehicle to move on the ground and in the air due to high speed. The vehicle will also be speed limitless since wind and electricity will increase with speed. These results in saving human expenses, increasing mobility of thins, raising standards of living

Keywords: *Cost in Transportation, Fuel, Gravity, Magnetic Force, Wind and Electricity Generated*

FINITE DIFFERENCE ANALYSIS OF BOUNDARY LAYER FLOW OF NANOFLUIDS PAST A VERTICAL PLANE WITH HEAT TRANSFER

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ABSTRACT

An unsteady boundary layer of Nanofluids flowing past a vertical plane has numerically been investigated. The boundary layer governing equations were non-dimensionalised and non-dimensional equations obtained. The nondimensional parameters which include Grashof number, Magnetic parameter, Eckert number and Prandtl number were obtained. The equations obtained were solved numerically by finite difference method. The velocity and temperature profiles are found to be affected by these dimensionless parameters. This study provides useful information that can be applied in various sectors which includes magnetic nanomaterial processing and automotive fields such as Nanofluid coolant.

Keywords: - *Nanofluids, non-dimensionalised and non-dimensional equation, Grashof number, Magnetic parameter, Eckert number and Prandtl, velocity and temperature, magnetic nanomaterial, Nanofluid coolant, automotive fields*

KyU is ISO 9001:2015

DETERMINING THE LANDFILL GAS POTENTIAL FOR ELECTRICITY GENERATION IN KERUGOYA KUTUS MUNICIPALITY

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ABSTRACT

Landfill Gas Technology involves the use of renewable source of energy where biogasis generated from organic wastes and subsequent use of the gas to produce electricity. This study assesses the use of KerugoyaKutus Municipality Solid Wastes from Kagio, Kutus and Kerugoya markets, through Landfill Gas technology to electricity production. The organic solid wastes generation potential in tonnes and the subsequent methane gas generation potential in m^3/year, will be estimated for a period of 10 years from 2023-2033.This will be followed by determining the electricity generation potential in Kwh/year. Economic viability of the project in this Municipality will be done based on the Net Present Values in U\$, Levelized cost of energy and Payback Period. Environmental impact analysis based on green gas emissions potential withand without energy recovery will be done. To undertake the wastes potential, a Land Gem model version 3.02, using the inventory defaults will be used. This research will provide a scientific guidance on viability of LFG electricity generation project in this municipality making the paper useful to Kirinyaga Local Authority who need to manage their organic wastes from thethree localmarkets. The research will also be beneficial to investors who may want to evaluate the LFG production potential.

Keywords; *Landfill Gas, Municipal Solid Wastes, Generation Potential, Green Gas Emissions, Land Gem Model*

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ASSESSMENT AND MAPPING OF NATURAL RESOURCES AND LAND USE WITHIN NAIROBI RIVER AND MBAGATHI SUB-BASIN

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ABSTRACT

Natural and human activities have impacts on the quality of water within a basin over time. Nairobi River Basin and Mbagathi Sub-basin are affected by diverse land use activities and changes within the upper, middle and lower sections of the basins. A comprehensive approach was used to examine the effects of land use activities within the basins. GIS spatial analysis was employed to examine the spatial relationship of the effects of land use activities in the basins. There was a significant change in the quality of water due to sewer line discharges, effluent from water services providers, solid waste disposal, industrial effluent from settlements and pesticides and herbicides from agricultural areas. From the above findings, there is need for stringent measures on conservation of the riparian for the rivers traversing the informal settlements as they are all non-point sources of pollution and discharge solid waste and raw effluent directly to the rivers through establishment of buffer zones and water quality monitoring programme.

Keywords: *Mapping, Natural resources, Basin, Land Use, Point Pollution, No-Point Pollution*

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CAPABILITY OF RULE BASED CLASSIFICATION TECHNIQUE IN IDENTIFYING SPRAWL AREAS: A CASE STUDY OF AREAS AROUND ELDORET TOWN, KENYA

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ABSTRACT

Use of satellite images to map city scapes has been successful to varying degrees since the launch of first Landsat satellite producing images of 30m spatial resolution. With this low resolution images, the extent of sprawl can be shown but not the sprawl patterns. However, despite most sensors delivering medium and high resolution satellite imageries, a great percentage of applications still rely on basic image processing techniques. These techniques overlook variations in soft classifiers, sub-pixel classifiers and spectra un-mixing. This study used rule based classification algorithms by applying five indices namely NDVI, NDWI, NDBI, Visible brightness and SAVI, to extract temporal land use/cover data from high resolution Sentinel-2 imageries 2020 to identify urban sprawl areas around Eldoret town in the study area. Results produced an overall accuracy of 91.67% and Kappa coefficient of 0.90 for 2020 and eleven urban sprawl areas were identified and mapped respectively. The findings confirm that use of rule based classification technique in LULC classifications gives high classification accuracy results hence the need for policy makers and planners to use the technique to carry out forward planning of areas to provide requisite infrastructure ahead of development.

Keywords: *Rule Based Classification; Indices; Urban Sprawl Patterns*

COMPOSITION, APPLICATION AND HEAT TREATMENT OF DUAL PHASE STEELS

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ABSTRACT

The term dual phase steels, or DP steels, refers to a class of high strength steels which is composed of two phases; normally a ferrite matrix and a dispersed second phase of martensite, retained austenite and/or bainite. DP steels were developed in the 1970's to respond to the need for new high strength steels without reducing the formability or increasing costs. Dual phase steels are characterized by a microstructure consisting of 75-85 vol% ferrite with the remainder being a mixture of martensite, bainite, and retained austenite. They have better strength-ductility combinations than ferrite-pearlite steels of equivalent tensile strength and are presently being used commercially. These HSLA steels have a typical composition of 0.12 %C, 1.7 %Mn, 0.58 %Si, 0.04 %V (Vanadium is used for microalloying). Their microstructure is composed of islands of martensite embedded in a matrix of ferrite, which is produced by giving the steel a "subcritical anneal" at ~800°C (in the two phase g-a region) and then it is quenched to room temperature. Research on these unique steels has increased exponentially since their development in the mid-1970s. Present understanding of relationships between composition, microstructure, and tensile properties is briefly reviewed, and some trends in developmental work presented.

Keywords: *Dual Phase Steels, Ferrite Matrix, Martensite, Bainite, Vanadium*

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CONSTRUCTION INDUSTRY OUTPUT AND CENTRAL BANK OF KENYA'S BASE LENDING INTEREST RATE (2007 – 2022)

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ABSTRACT

Performance of construction output is a pointer to economic wellbeing and thus requires effective management to maintain its contribution in a country's growth. However, in Kenya, there is a research gap on the interaction of construction output and CBK's base lending interest rates. This has the potential of limiting the government's capacity to effectively manage the construction industry output in Kenya. This study investigates Kenya's construction industry output and how it is affected by CBK's base lending interest rate. Time series data (for analysis) were obtained from Kenya National Bureau of Statistics and Central Bank of Kenya. The data covered a period of sixteen (16) years; from Year 2007 to Year2022, on yearly basis. The twin variables in this study were construction industry output and CBK's base lending interest rate in Kenya. Eviews (version 10) a statistical software application, was used for data analysis. The statistical outputs generated graphical analysis, tests of stationarity and regression analysis. Dependent variable (construction output) was regressed on the independent variable (CBK's base lending interest rate); applying the second differences of base lending interest rate and natural logarithms of the second differences of construction output. Results showed that base lending interest rates had no significant influence on the construction industry output in Kenya in the period of the study. A model explaining this outcome was developed which has a coefficient of determination (R^2) of 0(zero). However, it has been observed that much of the impacts of base lending interest rate start to be felt much later after their implementation. This is displayed by a regression model of lagged base lending interest rate which showed R^2 value of 0.17. This figure is an indicator that the regression model of lagged interest rate has explanatory powers and thus it was logical to conclude that base lending interest rate has an impact on construction industry output in Kenya. This paper presents empirical findings indicating objectively how the base lending Interest rate impacts construction output and can be adopted for policy formulation for purposes of regulating the construction industry in Kenya. Therefore, experts and stakeholders in the industry are highly advised to factor in this impact in the early stages of feasibility study and appraisal of construction projects.

Keywords: *Construction Output, Time Series, Stationarity, Explanatory Variable*

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SOCIO-DEMOGRAPHIC FACTORS OF FASHION PURCHASE: A CASE OF APPAREL CONSUMPTION AMONG KENYAN UNIVERSITY STUDENTS

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ABSTRACT

There has been a rapid growth of global fashion industry. Kenya like other developing nations is fighting for a slice of this growth and positioning itself as a competitive contributor to the same. In this regard, both the fashion marketers and academia are becoming increasingly interested in variables of fashion consumption. This study investigated the relationship between the socio-demographic characteristics of University students and apparel purchase. Demographic characteristics of students such as age, gender, marital status, religion and residence (urban/rural) play a key role in students' apparel fashion consumption decision. Targeting 4 public and 16 private universities, study sampled 7 universities and 534 students. However, 503 questionnaires were completed hence used to collect data, a Chi square was used to test the null hypothesis; Socio-demographic characteristics of university students have no relationship with their apparel consumption. Results showed that there was no significant relationship between age and fashion need conceptualization ($x^2 = 7.905$, df =5, p-value = 0.162) among university students. There was no relationship between students' gender and evaluation of all information before making apparel purchase (p-value = 0.066) though females were more likely to conceptualize a need before buying new clothes than males. There was a significant relationship between marital status of students and evaluation between possible alternatives (p-value =0.043). Religion of the students had no significant relationship with fashion consumption. In summary results of this study showed that demographic characteristics of respondents had no significant relationship with apparel fashion consumption decision making among university students (chi-square = 15.000, df = 12 and p-value = 0.241).

Keywords: *Apparel Consumption, Socio-Demographic Characteristics, Consumption Decision Making Process, University Students.*

INFLUENCE OF ENERGY CONSERVATION PRACTICES ON CUSTOMER SATISFACTION IN STAR RATED HOTELS IN MT. KENYA REGION, KENYA

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ABSTRACT

The hospitality sector consumes substantial amounts of resources and releases huge volumes of waste leading to environmental degradation. However, adopting green practices can change this trend. This study sought to establish the effect of energy conservation practices on customer satisfaction in star rated hotels in Mt. Kenya Region. The study was anchored on the Theory of Planned Behavior (TPB). Descriptive survey design was used. The study targeted all 24 star rated hotels in Mount Kenya Region namely; Nyeri, Laikipia, Embu, Meru and TharakaNithi. Yamane formula was used to obtain a sample of 243 respondents from a population of 622. Stratified random sampling was used to select the respondents who consisted of hotel managers, housekeepers and resident guests. Simple random sampling was used to select a sample from resident guests while census approach was used in selecting managers and housekeepers. Primary data was collected using researcher administered structured questionnaires. Data was analyzed using SPSS version 25. Results showed that energy conversation practices had a significant and positive relationship with customer satisfaction in star rated hotels in Mount Kenya Region. There is need for hotels to adopt simple low cost measures such as turning off equipment when not in use and making energy efficiency measures/equipment, energy management systems (EMS) and building design techniques that maximize available daylight in hotel rooms.

Keywords: *Hospitality, Environmental Degradation, Energy Conservation Practices Customer Satisfaction*

PREDICTING URBAN SPRAWL PATTERNS USING INTEGRATED MARKOV CHAIN, CELLULAR AUTOMATA AND ANALYTICAL HIERARCHY PROCESS MODELS AROUND ELDORET TOWN, KENYA

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ABSTRACT

One of the most rapidly growing urban phenomena in the 21st Century is emergence of sprawling settlements. Such settlements provide essential services but also cause some strain on these centers. To mitigate auto dispersion of these settlements requires forecasting of urban sprawl areas. Satellite remote sensing combined with advanced models of Cellular Automata (CA) - Markov chain and Analytical Hierarchy Process (AHP) plays a vital role in predicting future urban sprawl patterns. This study analyzed supporting factors causing urban sprawl around Eldoret town using Analytical Hierarchy Process (AHP) model. A total of eight independent variables: five connectivity factors, namely; distances to nearest roads, powerline, water line, employment centers and restricted areas; two physical factors, namely; slope and elevation and one socio-economic factor, namely; population density were applied in this model in order to rank them since all factors do not contribute equally to sprawling patterns. The analyzed supporting factors, simulated 2020 LULC and its transition probability matrix were used to predict 2029 LULC. The built-up areas for 2020 and 2029 were then extracted and overlaid to map out 2029 urban sprawl areas.   The CA-Markov chain and AHP models predicted that sprawl areas would take different sprawl patterns of linear and leapfrog, increasing from 138.91 km2 to 154 km2 during 2020 to 2029, respectively. There is therefore need for Uasin Gishu County government to do forward planning of areas giving priorities to roads, powerline and waterline in areas planned to be urban only in order to control sprawl patterns in agricultural lands.

Keywords: _Predicting Urban Sprawl; Cellular Automata; Markov Chain; Analytical Hierarchy Process; Urban Sprawl Patterns_

SUBTHEME FOUR: - HEALTH MANAGEMENT AND SOCIAL RESPONSIBILITY

OPTIMAL CONTROL OF CHOLERA INCORPORATING THE DYNAMICS OF THE INDUCED ACHLORHYDRIA CONDITION WITH COST EFFECT STRATEGIES

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ABSTRACT
A nonlinear dynamical system is proposed and qualitatively analyzed to study the dynamics of cholera disease in a population. The basic model is extended to include; reduce infection rate (u_1), increase rate of seeking treatment(u_2), decrease development of achlorhydria condition(u_3), increase recovery rate from achlorhydria condition (u_4), increase recovery rat e(improve efficacy of the drugs)(u_5). This leads to an optimal control problem which is qualitatively analyzed usingPontryagin's maximum principle. Numerical simulation of the resulting optimal control problem is carried out to gain quantitative insights into the implications of the model and pertinent results are displayed graphically. The simulation reveals that a multifaceted approach to the fight against the disease is more effective than single control strategies.

Keywords: *Cholera, Optimal Control, Pontryagin's Maximum Principle, Numerical Simulation, Multifaceted Approach*

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MOLECULAR EPIDEMIOLOGY OF NOROVIRUS IN KENYA

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ABSTRACT

Norovirus (NoV) is a major cause acute gastroenteritis (AGE) across the world. However, limited information on epidemiology of NoV exists in many African countries despite the plausible burden this enteric virus exerts on her population, especially <5 years old, the elderly and immunocompromised individuals. A systematic review of studies that adopted detection of NoV by conventional or RT-PCR from January 2013 to December 2022 was conducted to determine prevalence and seasonality of NOV in Kenya. For determination of NoV seasonality, only prospective studies conducted over of ≥12 months were included. "Norovirus and Kenya" was used to search for publications in the PubMed database. A total of eleven studies identified. Of these, 7 (63%) met the inclusion criteria. The remaining studies (4) were excluded because they did not involve detection of NoV. The samples types in studies included were stool for five studies and the remaining two studies analyzed environmental samples. Stools were obtained from participants of all ages living rural and urban settings of Nairobi, western and coastal Kenya. Participants included outpatients, inpatients and food handlers with or without diarrhea. This study established that NoV prevalence ranged from 15.2% to 25%. Interestingly, two studies conducted in Kilifi County reported an increase in NoV prevalence post-rotavirus vaccine introduction in Kenya in 2014. Although determination of seasonality of disease is important for adoption of disease control efforts, only one study attempted to determine NoV seasonality and reported that peak NoV infections occur in rainy seasons. On the other hand, two studies demonstrated high detection rate (63% to 100%) of NoV in water for domestic use sourced from rivers and boreholes and ineffally-contaminated waste water. From this study, it is apparent that NoV of public health importance in Kenya. Hence, increased NoV surveillance is required to guide adoption of diarrheal disease control programmes.

Keywords: *Norovirus, Acute Gastroenteritis, Diarrhea, Kenya, Africa*

UTILIZATION OF PARTOGRAPH IN THE MANAGEMENT OF WOMEN IN LABOR AMONG NURSES WORKING IN EMBU COUNTY, KENYA

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ABSTRACT

A partograph is a graphical representation of the fetal status, maternal status and progress of labor. Its proper interpretation assists in early detection of complications which may lead to morbidity and mortality. This study sought to determine the utilization of the partograph in management of women in labor in Embu County. The objectives of the study were to determine the level of utilization of the partograph, and nurses related factors influencing the utilization of the partograph. Across-sectional study design was conducted in selected hospitals within Embu County. The study population comprised 124 nurses working in maternity wards. Purposive sampling technique was used to choose health facilities under study while simple random sampling of participants was done. Structured questionnaires were used to collect quantitative data while focused group discussions was conducted and key informants interviewed for qualitative data. Data was analyzed using SPSS Version 23 and presented using tables, figures, bar charts and narration. Binary logistic regression was used to assess the possible association and strengthofassociationwasmeasuredusing95% confidence interval; chi-square was used to check for statistically significant results at a p-value of 0.05. The study revealed that, nurses related factors influencing utilization of the partograph included negative attitude and lack of training on partograph use. Majority of nurses working in labor ward felt that partograph use is time consuming and needed supervision on partograph use. In addition, majority of the nurses were not trained on Partograph use from the time they graduated from college. The study recommends policy makers and nursing administrators to ensure that all qualified nurses use the partographin the care of women in labour.

Keywords: _Partograph use; Utilization of the Partograph; Partogram use in Kenya_

A SCOPING REVIEW: IDENTIFYING THE ROLES OF THE NURSE CLINICAL INSTRUCTOR IN MIDDLE INCOME COUNTRIES

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ABSTRACT

The process of educating a nurse till they are able to effectively take on a professional role requires the student to go through theory work in class as well as clinical practice both in the laboratory skills labs and in clinical sites in the hospital and community. Nursing clinical practicum is widely agreed to be the nucleus of Nursing Education by both Nurse Educators and Staff Nurses. Nursing Clinical Instructors main activity is to help the Nursing students not only translate the theory they learn in class to clinical practice but also to orient them to their future roles as Nurses working in the clinical area in different functions. However, their role is not well understood as they are situated in both academia and clinical sites, more-so in developing countries since nursing is still developing and nurses are taking on different roles. The focus of focus of this research is to review literature on the role of nursing clinical Instructor in Low-and-Middle Income Countries of which Kenya is one. The methodology used is Scoping Review. It will utilize three databases namely EBscohost, Pub Med and Pro Quest which will help identify the roles of Nursing Clinical Instructors as seen by nurse student, the academic staff and the staff nurse in the hospital. Content analysis will be used to analyse the data received. This research will be used to add into research knowledge regarding Nursing Clinical Instructors, create awareness to both nursing staff and administrators of nursing academic institutions on the roles of Nursing Clinical instructors both in the academia and clinical area.

Keywords: - *Nurse, Clinical Practice, Skills Laboratory, Clinical Sites, Hospital Community, Clinical Practicum*

PRACTICES BY NURSES TO PREVENT PRESSURE INJURIES AT A LEVEL 5 HOSPITAL IN KENYA

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ABSTRACT

Pressure ulcer refers to a breakdown of skin due to prolonged pressure or shear. The incidence of pressure ulcers is about 20% in most clinical settings, despite existence of numerous national and international guidelines. The aim of this study was to assess the level of adherence to the Nursing Council of Kenya (NCK) procedure manual on pressure ulcer guidelines among nurses working at Embu Level 5 Hospital, and the associated challenges.

This was an institution based descriptive cross-sectional study. Data was collected using a researcher developed self-administered questionnaire based on NCK procedure manual guidelines. 145 respondents were selected using stratified random sampling combined with systematic random sampling. Data was analyzed using SPSS version 21.

On adherence to NCK guidelines, the study showed that, 53.91% always adhered to NCK guidelines, 36.5% sometimes adhered and 9.6% never adhered. The main reported challenges to adherence of guidelines were shortage of staffs (36.3%) and inadequate equipment (24.7%). Others were lack of the guidelines in the wards, lack of time for documentation and patient turning. Availability of guidelines in the wards ($X2 =5.546$, df=1, P=0.019), lack of time for documentation ($X2 =5.642$, df=1, P=0.018, RR=2.63) and patient turning ($X2 =5.817$, df=1, P=0.016, RR=2.72) were statistically significant at P<0.05. The study concluded that, Adherence to NCK guidelines was low, and significant challenges were lack of guidelines in the ward, lack of time for documentation and patient turning.

Keywords: *Clinical Settings, Manual Pressure Ulcer, NCK Guidelines*

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MECHANISMS FOR PUBLIC PARTICIPATION IN HEALTH COMMUNICATION CAMPAIGNS: CASE OF THE UNIVERSAL HEALTH COVERAGE IN KENYA

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ABSTRACT

Public participation, partnerships, consultation and effective communication is paramount to any public health engagement. Research indicates that public participation interventions have a positive impact on a range of health outcomes across various conditions. Kenya is one of the countries that has adopted the Universal Health Coverage as one of the big four priority agenda. According to article 10 of the Constitution of Kenya 2010, democracy and people's participation, human rights, among others, are identified as essential national values and principles of governance. Despite the envisaged positive outcomes of the UHC program and the recognition by the constitution that public participation is paramount, progress towards this goal has been slow. One of the problems cited is lack of adequate information that has led to slow uptake and near failure of the program. The challenges for lack of effective participation include; slow response by the public, no guidelines as to what constitutes public participation, packaging of the agenda items in simplified forms that citizens can understand as well as the management of the public participation due to the vastness of the country and the ethnic diversity. The research geared towards answering the question; what are the existing mechanisms of public participation in strategic health communication campaigns in creating awareness of the UHC program in Kenya? Through secondary analysis of previous research, the findings are that whereas strategies and roadmaps in other areas have been developed for the implementation for the UHC program, the public participation plan is not clearly outlined and this is one of the reasons why despite the pilot program being run in the counties of Isiolo, Kisumu, Machakos, and Nyeri, the program has not picked up in other counties.

Key words: Public participation; *health communication campaigns; Universal Health Coverage*

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INJURY PATTERNS AND MORTALITY RATE OF MOTORCYCLE RELATED INJURIES IN KERUGOYA TOWN, KIRINYAGA COUNTY

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ABSTRACT

Globally, Road Traffic Injuries (RTIs) are ranked 8th among the leading causes of disability adjusted life years lost among all populations and is the leading cause of death in children and young adults 5-29 years of age. The burden is disproportionately borne by pedestrians, cyclists and motorcyclists, in particular those living in developing countries. Kenya, as a country has made little efforts in ensuring safety for all road users at all times. The objective of this study was to assess the patterns and mortality rates of motorcycle related injuries in Kerugoya town, Kirinyaga County. A retrospective cross- sectional study design was employed. Secondary data on motorcycle related accidents was collected and analysed for 385 victims. Data was collected using structured checklists. The process involved one-year review of existing records from Kerugoya Referral Hospital and the County Traffic Police Department. Data analysis was done using Statistical Package for Social Sciences (SPSS) version 20. The mean age of motorcycle crash victims was 31.5 years (range 7-60years). Males were 228(62.1%) and females 139(39.7%). The most common pattern (anatomical part) of injury sustained by victims was lower extremity injuries 124(34.0%), followed by head and neck injuries 107 (29.1%), chest injuries 74(20.1%) and upper extremity injuries 62(17.0). Majority of motorcycle riders 62 (32.6%) and passengers 58 (30.5%) who did not have a helmet during the time of crash sustained head and neck injuries. Passengers (65%) constituted a larger percentage of the crash injury victims reporting to hospital. We recommend that County traffic department should organize consistent public awareness education on road safety.

Key Words: _Motorcycle/motorbike, Motorcyclists, patterns of Injuries, Collision_

EXPLORING THE POTENTIAL OF NANOPARTICLES FOR TARGETED DRUG DELIVERY IN DISEASE TREATMENT

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ABSTRACT

In recent years, there has been growing interest in the use of nanotechnology for drug delivery in disease treatment. Nanoparticles, which are particles with a size range of 1-100 nanometers, have unique properties that make them attractive for targeted drug delivery. They can be designed to specifically target diseased cells and tissues and can also protect the drug payload from degradation and elimination before reaching the target site. Therefore, further research and development were needed to fully realize the potential of nanoparticles for targeted drug delivery. Furthermore, this paper aimed to introduce the ongoing research on the use of nanoparticles for targeted drug delivery that was conducted at the Kenya Medical Research Institute (KEMRI) in Nairobi, Kenya. KEMRI was a leading research institution in East Africa with a strong focus on advancing health research in the region. The study focused on developing nanoparticle-based drug delivery systems for the treatment of infectious diseases prevalent in the region. To carry out this research, a mixed-methods approach was adopted, using both quantitative and qualitative data collection methods. A population of 100 pharmacists in Nairobi, Kenya, was targeted, from which 10 were randomly selected using simple random sampling technique. For the quantitative data collection, a structured questionnaire was used to collect information on the pharmacists' knowledge of nanoparticle-based drug delivery, their opinions on the potential of nanoparticles for drug delivery, and their experience with the use of nanoparticles in drug delivery. The questionnaire was administered through face-to-face interviews and was analyzed using SPSS. Descriptive statistics were used to analyze the data, and the findings were presented in tables and graphs. For the qualitative data collection, in-depth interviews were conducted with selected pharmacists to explore their perceptions and experiences with the use of nanoparticle-based drug delivery in disease treatment. The interviews were audio-recorded, transcribed, and analyzed using thematic analysis. Open-ended questions were used to encourage the pharmacists to express their thoughts and ideas freely. The findings of the study were presented in two parts. The quantitative findings were presented in tables and graphs, summarizing the pharmacists' knowledge, opinions, and experiences with the use of nanoparticles for drug delivery. Furthermore, the qualitative findings were presented in the form of themes that emerged from the interviews, providing insights into the pharmacists' perceptions and experiences with nanoparticle-based drug delivery. Based on the findings, conclusions were drawn on the potential of nanoparticle-based drug delivery for disease treatment, as well as the challenges and opportunities associated with its use in clinical practice. The results of this study contributed to the development of effective and safe nanoparticle-based drug delivery systems that can be used to treat diseases in the region and beyond.

Key words: *Nanoparticles, Drug Delivery, and Disease Treatment*.

MOLECULAR CHARACTERISATION OF FULL-LENGTH HIV-1 ENVELOPE-GENE IN ANTIRETROVIRAL TREATMENT INJECTION SUBSTANCE USERS IN NAIROBI, KENYA

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ABSTRACT

Statistics have shown that injection drug use and antiretroviral therapy influenced HIV-1 diversity and epidemiology. However, molecular characteristics of HIV-1 envelope-gene among antiretroviral treatment Kenyan injection drug users remains unknown. This cross-sectional study determined HIV-1 *envelope*-gene diversity, co-receptor tropism, and fusion inhibitor drug resistance among injection drug users in Nairobi, Kenya. Injection drug users (n=249) were recruited through respondent driven sampling method. Socio-demographic data was collected from each participants upon enrolment. HIV-1 *envelope*-gene was amplified and sequenced directly. Diversity, co-receptor tropism, and drug resistance mutations of the resulting sequences were determined using COMET, MEGA, and DNASTAR bioinformatics tools, respectively, after alignment with well characterised HIV-1 reference sequences. There were 27 (73.0%), 6 (16.2%) and 4 (10.8%) subtypes A1, AG and A1/G/AE recombinants respectively. Phylogenetic studies revealed that 35 (94.6%) sequences out of the 37 available sequences (72.9%) clustered with at least one other sequence, with little genetic diversity. Co-receptor typing showed that, 33 (86.4%) and 4 (10.8%), respectively, of the HIV isolates belonged to CCR5 and CXCR4. No mutation conferring resistance to enfuvirtide was detected. Identification of HIV-1 envelope-gene diversity, co-receptor tropism, and fusion inhibitor resistance informed decision on treatment, vaccine trials, and prevention of the spread of HIV.

Keywords: - *HIV-1 Envelope-gene, Antiretroviral Treatment, Injection Drug Users*

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EFFECT OF ANTI-HYPERTENSION THERAPY ADHERENCE ON BLOOD PRESSURE CONTROL AMONG OUTPATIENTS AT KERUGOYA REFERRAL HOSPITAL

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ABSTRACT

Approximately 16 to 37% of the people in the world suffer from hypertension. This disease causes 7.6 million deaths per year worldwide. It is not curable but can be controlled using anti-hypertension therapy (anti-hypertension drugs and lifestyle modifications). Many patients on anti-hypertension therapy in America and Africa have uncontrolled blood pressure due to non-adherence. The study`s objective was to determine the effect of anti-hypertension therapy adherence on blood pressure control among out-patients at Kerugoya Referral Hospital in Kirinyaga County of Kenya. The study adopted descriptive cross-sectional design. 149 respondents were selected using purposive sampling. A structured questionnaire was used to gather data on respondents` profiles and their anti-hypertension therapy adherence levels. Their blood pressure was determined. Data was analyzed using descriptive statistics, and chi square used to determine associations.77.2% of participants were female of mean age 50.9 years. 47.7% of participants adhered to medication, 26.2 % to lifestyle modification while only 15.4% adhered to both medication and lifestyle modification. 45.1% of patients who had medication adherence had a controlled blood pressure while 88.5% of patients who did not adhere to medication had uncontrolled blood pressure. There was a significant association (p=.000) between medication adherence and blood pressure control. Intervention is needed to improve the rate of adherence to anti-hypertension therapy which ultimately controls patients' blood pressure. Frequent education and constant reminders of the importance of anti-hypertension therapy adherence is recommended as well as establishment of a cost waiver system for needy clients.

Keywords: *Kenya, Hypertension, Anti-hypertension Therapy, Therapy Adherence, Controlled Blood Pressure*

AN ASSESSMENT OF SOCIAL MEDIA USE ON MENTAL HEALTH OF UNIVERSITY STUDENTS

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ABSTRACT

Studies on how social media platforms are being used as tools for individuals to interact, connect and support one another have been done in the past. A great number of youth are spending significant amount of time accessing social media sites. Scholars are yet to reach a consensus on whether usage of social media is beneficial or detrimental on the mental health of young adults. This study explored the effects of social media access on the mental health of university students. The study used phenomenological research design. The target population was 10,000 students. The sample size was 309 students drawn from 5 purposely selected schools. Data was collected using randomly distributed questionnaires and analyzed using SPSS's descriptive statistics and presented using frequency tables, pie charts, graphs, cross tabulations. The findings revealed that university students are spending upto six hours of their time in a day on social media to access content on fun, video games and sports. Results showed that time spent on social media had no significant effect on the mental health of students and this could be attributed to the fact that the content students' access of social media enables them to cope with stress and other issues which could have a detrimental effect on their mental health. Based on the findings, there is need to encourage university students to find additional activities they could engage in while on social media which could contribute to the lives in a better way such as blogging, online jobs, and listening to motivational material.

Keywords: *Social media, University Students, Mental health, Stress*

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RISKY SEXUAL BEHAVIOR OF UNDERGRADUATE UNIVERSITY STUDENTS AT CHUKA UNIVERSITY

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ABSTRACT

Unsafe sexual practices, also referred to as risky sexual behaviour, pose a great risk of contracting sexually transmitted infections (STI) and unwanted pregnancies. Existing literature indicates that university students are more likely to engage in risky sexual behaviour because of their vulnerability. Medical records at Chuka University showed an increasing trend of STIs treated at the University health facility. Thus, the aim of this study was to establish safe sex practices among undergraduate students at the University. A self-administered research questionnaire was used to obtain data on sexual practices from 352 randomly selected participants. Data was analysed using SPSS v.24. The mean age of study participants was 21.37 ($\pm$1.75) and a range of 17 – 29 years. A majority of the students were males from rural parts of Kenya (56.5%) and Christians (88.6%). Approximately 11.4% were cohabiting and most of them were pursuing science degree programs (59.4%). 66.8% reported having had sexual intercourse with a sexual debut range of 10 – 25 years. Risky sexual behaviour identified included multiple sexual partners (37.8%), having sex under the influence of drugs (36.2%), failure to use condoms (20.1%) and having sex to make money (14.3%). Having multiple sexual partners was associated with marital status (p= 0.023), use of drugs (p= 0.002) and knowledge of safe sex practices (p= 0.016). Engaging in sex under the influence of drugs was associated with place of birth (p=0.02), place of residence (p=0.014) and monthly allowance (0.048). Use of condoms was associated with marital status (p= 0.034) and year of study (p= 0.006). Thus, the university students were involved in risky sexual behaviours which were associated with the use of drugs, place of birth, place of residence, and the amount of money available to them. The findings of this study emphasize the need for continuous education on safe sex practices among undergraduate university students.

Keywords: - *Risky Sexual Behaviour, Sexually Transmitted Infections, Safe Sex Practices*

AWARENESS AND PRACTICE OF PROSTATE CANCER SCREENING AMONG MEN WITH URINARY TRACT INFECTION AT MERU TEACHING AND REFERRAL HOSPITAL

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ABSTRACT

Globally, prostate cancer (PCa) is one of the leading cancers among men. Although the disease is majorly preventable through screening, the uptake of these screening services has been reported to be low. Previous studies on PCa have focused on men in general despite men with urinary tract infections being known to have a relatively higher risk of developing PCa. Meru County has significantly contributed to the rising incidences of cancer, including prostate cancer (19.4%). The aim of this study was to assess awareness and practice of PCa screening among men above 40 years with urinary tract infections attending Meru Teaching and Referral Hospital. Purposive sampling was used to obtain 65 men with a confirmed diagnosis of UTI. Data was analyzed using SPSS v.24. The mean age of participants was 61.82(±13.51) years. A majority of the patients were married (73.8%) and had more than the primary level of education (64.6%). More than half of the participants lived in rural areas (72.3%), were Christians (83.1%), and engaged in farming activities (41.5%). Almost three-quarters of the patients (67.69%) were aware of PCa screening and learned about it from their healthcare providers (61.36%). There was a significant relationship between an individual's BMI and awareness of PCa screening [(X^2(1, n=65) = 0.952, p = 0.004]. However, family history of PCa was the only significant predictor of awareness of PCa screening (p= 0.032, AOR= 5.239 [95% CI =1.144 - 23.785]). Nearly half of the patients had screened for PCa (49.2%), mainly after being recommended by a healthcare giver (50%). Uptake of screening was associated with BMI [(X^2(1, n=65) = 0.929, p = 0.008]. Men 40 years and above with UTI were aware of PCa screening but had a poor uptake of screening services. The results of this study underscore the need for health education and a campaign on the importance of PCa screening among men above 40 years with urinary tract infections.

Keywords: - _Prostate Cancer, Screening, PCa, Urinary Tract Infections_

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LIMITED POTENCY OF ADJUVANT CAPECITABINE TREATMENT IN TNBC PATIENTS WITH RESIDUAL INVASIVE DISEASE

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ABSTRACT

The triple negative breast cancer (TNBC) is one of the sub-types of breast cancers. This subtype is not only very aggressive, but also has worse prognosis, than the others. For instance, patients without pathological complete response (pCR) after NACT have a 20 - 30% risk of relapse of the disease within 2 years. The adjuvant maintenance treatment options for this group of patients who do not achieve pCR are limited. Capecitabine, an anti-metabolite that has been shown to be effective for other cancers such as, Gastro-intestinal cancers is among the most commonly used drug for the TNBC with residual invasive carcinoma. However, given the heterogeneity of TNBC, aggressiveness of the sub-type, the overall poor prognosis, high dosage required for efficacy, associated toxicity or intolerability of the drug, there is need for determination and development of new therapies, treatment modalities or strategies to optimize response rates as well as management of severe side effects. The aim of the meta-analysis was to assess the absolute benefits, weighed against the adverse effects of capecitabine therapy in TNBC patients with residual invasive disease compared with other standard treatment options. The 5-year overall treatment effect defined as the overall survival hazard ratio for death was 1.09 (0.75-1.64), the average relative risk reduction of death only 11.9%. Increased events including grade 3 and 4 haematological, gastrointestinal toxicities and hand-foot syndrome were noted in the capecitabine treatment arm compared to controls. The limited potency as seen in the marginal overall survival advantage and adverse effects highlights the need for careful selection of patients who may and may not benefit from the treatment.

Keywords: *TNBC, Adjuvant Capecitabine, Residual Invasive Carcinoma, NACT*

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EFFECT OF PRISON PROGRAMS ON REHABILITATION OF INMATES IN COUNTY, KENYA

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ABSTRACT

The main objective of prisons in general and Kenyan in particular is to rehabilitate the inmates facilitate acquisition of self-dependence skills with a view of avoidance of repeat. The aim of this research was to interrogate the effect on male and female inmates' life in prison in their journey of rehabilitation. The study was directed by the objective; to examine the effect of prison programs on inmates' rehabilitation. The study employed descriptive survey research design. Questionnaires, interview guides as well as Focus Group Discussions were adopted to gather both quantitative and qualitative data. The investigation targeted 500 convicts who included first-time offenders and recidivists, 30 prison warders, and 4 key informers in Thika main and women prison. Stratified sampling was used in the investigation to first place the convicts according to gender to get three hundred male and two hundred female convicts. A sample size of 30% of the entire population of male and female convicts and prison warders was used in the investigation to get 90 male, 60 female convicts and 9 prison officers. Quantitative data was analyzed descriptively by percentages and mode and were recorded in graphs and tables. Qualitative data were examined thematically and in patterns presented and formed in verbatim and narrative forms. The study established that inmates participated in elaborate prison programs which helped them ease the pain of imprisonment and gave them hope of getting employment after imprisonment making them more positive about future. Therefore, the study recommended that the prison management should sensitize inmates on the essence of the prison programs as they offer life skills which are supposed to help them when easily fit they go back to society. The government should also improve the rehabilitative programs and provide more resources geared towards these programs. Further, the government should set aside stipends to facilitate inmates to start a business after imprisonment using some of the skills acquired while in prison.

Keywords: *Prison Programs, Rehabilitation of Inmates*

SUBTHEME FIVE: - SCIENCE, ICT & MATHEMATICAL MODELLING

VARIATION IN SOIL NEMATODE COMMUNITIES IN MUNG BEAN (VIGNA RADIATA) CROPPING SYSTEMS

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ABSTRACT

Vignaradiata is an important subsistence and cash crop in semi-arid regions of Kenya.Plant-parasitic nematodes cause decline in mung bean yield. We assessed the prevalence of nematode communities in mung-bean cropping systems in Mbeere Sub County of Embu County (Kenya). Soil physico-chemical properties, nematode indices, and metabolic footprints were determined. Soil samples were collected from mung bean monocrop and maize-mung bean intercrop systems. Using the modified Baerman technique, nematodes were extracted and subsequently identifiedto genus level. Differences in the abundance of nematode genera, indices, and metabolic footprints in the two systems were assessed using one-way analysis of variance. Non-metric multidimensional scaling was used to evaluate the spatial distribution of nematode genera. Both mung bean monocrop and maize-mung bean intercrop systems significantly influenced the prevalence of *Meloidogyne* (P=0.03), *Prismatolaimus* (P=0.01), and *Scutellonema* (P=0.05). Nematode indices were not significantly different.In the two systems the structure index was above 50% and MI 2-5 was 2.52. Composite footprint was significantly higher in the intercrop system. *Aphelenchus* and *Eucephalobus* were positively related to Carbon while *Eudorylaimus*, *Geomonhystera,* and *Pratylenchus* showed significant positive association with clay. Data from this study can be used indevelopment of strategies to sustainably manage parasitic nematodes.

Key words: *Mung Bean, Nematodes, Metabolic Footprints, and Indices*

EFFECT OF CULTURAL CONDITIONS AND PHYSICAL FACTORS ON PRODUCTION OF ANTIBIOTIC METABOLITES BY SELECTED ACTINOMYCETES

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ABSTRACT

Antibiotic resistance is one of the biggest global problem of our times. The leading producers of antibiotics that can be used to curb this problem are actinomycetes. This study sought to isolate antibiotic producing actinomycetes from the soils of Menengai crater and identify the cultural and physical factors that favoured production of antibiotics by selected actinomycetes. Soil samples were collected from 32 randomly selected sampling points within Menengai crater and actinomycetes isolated using serial dilution technique and tested for antagonism against selected bacterial and fungal pathogens using primary and secondary screening bioassays. Based on broad spectrum of activity and the size of zone of inhibition, four potent actinomycetes were selected for further studies. The effect of growth media, pH, temperature, incubation period, aeration, inoculum concentration, carbon source, nitrogen source and salt concentration on growth and production of antibiotic metabolites was determined. The isolated presented varying morphological characteristics. There was a significant difference in the diameters of zones of inhibition produced by the test pathogens when subjected to antibiotic metabolites from the selected actinomycetes (F = 6.6046 P = 0.001338). The growth and production of antibiotics by the selected actinomycetes was favoured by use of Luria Bertani as the culture medium, a pH of 6, incubation temperature of 28^oC, incubation period of 7d, aeration rate of 200rpm, inoculum concentration of 1%, glycerol as carbon source, oat meal as nitrogen source and a salt concentration of 1.5%. There is need to carry out structure elucidation of the antibiotics from the selected actinomycetes.

Keywords: *Actinomycetes, Antibiotics, Culture, Extraction, Sensitivity.*

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EFFECTS OF LEASEHOLD ON COMMUNITY FOREST ASSOCIATION BENEFITS IN DRYLAND RESOURCES MANAGEMENT: A CASE STUDY OF KIBWEZI FOREST IN KENYA

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ABSTRACT

The aim of this paper was to investigate whether or not community forest association (CFA) get benefits as they conserve dryland forest that is also fully leased. The study adopted descriptive survey design and was conducted between the year 2018 December and 2020 January in Kibwezi forest. 139 individuals were issued with questionnaires (household survey) and 5 officials from forest department were interviewed. The questionnaires response rate was 96% since 134 questionnaires out 139 were returned. Introduction of leasehold significantly reduced benefits community forest association used to get. There is no significant association between being a member of Community Forest Association and getting employment in dryland forest conservation since Chi square results were; $\chi^2 =3.953$, df=3, *P*=.267. There is no special benefit the Community Forest Association gets from conservation of Kibwezi forest. There should be incentives for the community to partner in the management of the leased forests in order to get the desired results that confer benefits to the Community Forest Association and compel the lessee to adhere to the legal requirement of continued access of benefits to the communities as it was before the lease.

Keywords: *Participatory Forest Management; Lessee; Lease; Benefits; Forest Dwellers; Conservation; Community and Stakeholders*

REVIEW ON VARIATION IN GENETIC AND CHEMICAL CONSTITUENTS OF STRYCHNOS HENNINGSII POPULATIONS IN KENYA

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ABSTRACT

Strychnos henningsii is an indigenous medicinal plant species widely used in the tropical Africa. Studies have revealed that this plant has been used as a remedy for various ailments including rheumatism, gastrointestinal complications, abdominal pains, syphilis, snakebites, diabetes malaria, arthritis amongst others. Phytochemical and pharmacological studies have identified various compounds namely alkaloids, anthraquinones, cardiac glycosides, chalcones, flavonoids, phenolics, proantho cyanidins, saponins, steroids, tannins and triterpenes from the crude extracts of *S. henningsii*. These chemical constituents exhibited analgesic, antibacterial, antidiabetic, anti-inflammatory, antioxidant, antiplasmodial, antiprotozoal, antispasmodic as well as cytotoxity activities. Secondary metabolites are known to aid plants in coping with various environmental stresses. Environmental stress triggers expression of genes for the enzymes involved in the biosynthesis of secondary metabolites many of which have higher medicinal value despite being useful in plant defense mechanisms. The present review focuses on the chemical constituents, pharmacological properties and genetic variation of *S henningsii* across its geographical range.

Keywords: *S Henningsii Variation, Genetic, Chemical Constituents, Medicinal, Environmental Stresses*

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DETERMINATION OF INVINTRO LETHALITY OF ACTINOMYCETES ANTIBIOTIC EXTRACTS FROM MENENGAI CRATER GEOTHERMAL VENTS, KENYA

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ABSTRACT

Drug resistance is a serious threat to human existence today. This study investigated sensitivity of selected pathogenic microorganisms to antibiotic extracts from soils of Menengai crater geothermal vents in Kenya. Antibiotic producing actinomycetes were isolated from geothermal vents and identified using colony characteristics and biochemical means. Sensitivity of selected pathogenic microorganism was carried out using primary and secondary screening techniques. Four actinomycetes coded PAN 9, PAN 18, PAN 117 and PAN 138 were selected for further analysis based on the size of zone of inhibition and broad spectrum of activity. Extraction of antibiotics was carried out using ethyl acetate. Sensitivity test of the pathogens to the extracts was done using Karby Bauer disk diffusion technique and Cytotoxicity of antibiotic extracts carried out using Brine shrimp lethality test and sheep blood hemolytic bioassays. Isolates presented typical actinomycetes characteristics. A total of 20 actinomycete isolates showed antagonism against the test pathogenic microorganisms. Selected actinomycetes inhibited growth of Gram positive and negative bacterial and fungal pathogens in both primary and secondary sensitivity tests. There was a significant difference in the diameters of zones of inhibition produced by the test pathogens when subjected to antibiotic metabolites from the selected actinomycetes (F = 6.6046 P = 0.001338). The minimum inhibitory concentration and minimum bactericidal concentration/minimum fungicidal concentration did not vary significantly (F=0.4503, P = 0.7187). The LC_{50} values of the antibiotic extracts varied from 2.438±0.47µg in PAN 9 to 9.3455±0.41µg in PAN 138. PAN 19 and PAN 117 showed partial hemolysis while PAN 9 and PAN 138 exhibited complete hemolysis of sheep erythrocytes. There is need to purify and conduct structural elucidation of these antibiotics to determine whether or not the observed hemolysis resulted from the said antibiotics or other compounds in the extract.

Keywords: *Actinomycetes, Antibiotic, Extracts, Cytotoxicity, Invitro*

EFFECTS OF FRESH WATER DEGRADATION ON HUMAN ACTIVITIES: A CASE OF ATHI RIVER, MACHAKOS COUNTY, KENYA

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ABSTRACT

Global diminishing of essential natural resources for survival of biodiversity due to depletion and pollution is a concern for governments and the United Nations's agenda 21 which suggested best ways to conserve the resources. African water vision 2025 has raised concerns over equitable and sustainable use of water resource for socioeconomic development. There is great global concern over high levels of freshwater degradation. In Kenya, freshwater degradation is on the rise as reported by National Environmental Monitoring Authority. The authority has given warning on poor solid waste disposal and discharge of effluents most water bodies. In Machakos County where the study was carried out there is evidence of freshwater degradation yet the majority of residents are highly dependent on fresh water sources for their livelihood. No study had been carried out to establish a relationship between degradation of water resources and the community's livelihood. This study assessed effects of freshwater degradation on human economic activities including domestic consumption, agricultural activities, and fishing activities. The study adopted a descriptive research design. Both qualitative and quantitative data were collected from 160 respondents and analyzed using descriptive statistics and later subjected to inferential statistics. The Pearson Correlation test (r=0.195, p=0.028) revealed a significant correlation between water degradation and level of disturbances on domestic activities. Regression equation: $A=2.345406+0.345X_1$, (P>0.05) showed a significant relationship between water degradation and agricultural activities. The coefficient of the regression was 0.167at (P<0.05) implying that a unit increase in water degradation significantly increased disturbances on fishing activities by 0.167 units.

Key words: *Natural Resource, Fresh Water, Degradation, Human Activities*

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A DEEP DECISION FORESTS MODEL FOR HATE SPEECH DETECTION

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ABSTRACT

Detecting and controlling propagation of hate-speech over social media platforms is a challenge. This problem is exacerbated by extreme fast flow, readily available audience, and relative permanence of information on social media. The objective of this research is to propose a model that could be used to detect political hate speech that is propagated through social media platforms in Kenya. Using Twitter textual data and Keras Tensor Flow Decision Forests (TF-DF), three models were developed that is, Gradient Boosted Trees with Universal Sentence Embeddings (USE), Gradient Boosted Trees, and Random Forest respectively. The Gradient Boosted Trees with USE model exhibited a superior performance with an accuracy of 98.86%, recall of 0.9587, precision of 0.9831, and AUC of 0.9984. Therefore, this model can be utilized for detecting hate speech on social media platforms.

Keywords: - *Hate Speech Detection, Tensor Flow Decision Forests, Gradient Boosted Trees, Universal Sentence Embeddings, National Cohesion and Integration Commission.*

MYKURA REMOTE ELECTION MANAGEMENT AND VOTING SYSTEM

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ABSTRACT

MyKura is a remote election management and voting system offering a solution for free, fair, credible, secure, verifiable, non-rigged, and fast remote voting. This system aims to conduct elections in a carbon-free way, reducing greenhouse gas emissions resulting from travel to and from polling stations. MyKura enables remote voting using a computer, smartphone, or feature phone through Web-Vote, App-Vote, and USSD-Vote. Tallying is done by computers, and the voting system is hosted on carbon-neutral servers. The objective of MyKura is to make voting accessible, secure, and eco-friendly, thereby revolutionizing the way elections are conducted in Africa and around the world. To ensure the security of the system, MyKura integrates a VVPAT system and a soft ballot printing system to detect and prevent election fraud through cryptography algorithms and techniques. Furthermore, MyKura is designed to reduce post-election violence in Africa and make voting something to be proud of. The methods used to achieve these objectives include the integration of the VVPAT system, a soft ballot printing system, and intense cryptography algorithms and techniques to ensure a secure and verifiable voting process. The voting system is also hosted on carbon-neutral servers to reduce carbon emissions. The potential impact of MyKura is enormous. It offers a solution for free, fair, credible, secure, verifiable, non-rigged, and fast remote voting, making voting accessible to more people. It also reduces carbon emissions resulting from travel to and from polling stations, contributing to environmental sustainability. In conclusion, MyKura has the potential to revolutionize the way elections are conducted in Africa and around the world. It offers a secure and verifiable voting process, reduces carbon emissions, and aims to reduce post-election violence. The implementation of MyKura has the potential to make voting something to be proud of and contribute to environmental sustainability.

Keywords: - *MyKura, Remote, Election Management Voting System, Polling Stations, Environmental Sustainability*

WEB SERVICES SHARING AMONG BUSINESS ENTERPRISES

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ABSTRACT

Web services are self-contained, modular, distributed, dynamic applications that can be described, published, located, or invoked over the network to create products, processes, and supply chains. These applications can be local, distributed, or web-based. The services are built on top of open standards such as Transmission Control Protocol/Internet Protocol (TCP/IP), Hypertext Transfer Protocol (HTTP), HyperText Markup Language (HTML), Extensible Markup Language (XML) and Java. Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer. With web services, companies are able to host their services in a wider market and also connect to other companies. However, with business expansion also follows trust issues. In order to share Web Services in a business partner relationship, it is necessary to have a relation of trust. The purpose of this article is to review how Web Services can be made as a "network of trust" between partners and possible solutions that can be applied to address the problem. The study will undertake desktop literature review of literature on the subject. A range of web services trust issues and their causes will be identified and discussed. Further the article will attempt to propose possible solutions to address the problem.

Key words: *web services, network of trust, business enterprises*

ARNOLD'S FACTORIZATION ALGORITHM FOR SEMI-PRIMES AND THE CRYPT-ANALYSIS OF RSA CRYPTOGRAPHY

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ABSTRACT

Integer Factorization is a hard problem in mathematics. There are currently no classical algorithms that can factorize all the integers in polynomial time, especially large integers with over 100 digits. Due to this difficulty, integer factorization has been adopted in RSA cryptography to secure data and information all over the internet. Arnold's Factorization Algorithm is a simple three step algorithm which aims at factorizing relatively large semi-primes in polynomial time. In this paper, a proof of concept for the factorization of up to a 50-digit semi-prime is given. This is achieved through optimization of the algorithm using modular arithmetic properties.

Keywords: Arnold's Factorization Algorithm (A.F.A.), Modular Factorial, Euclidean Algorithm, RSA Cryptography.

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KNOWLEDGE MANAGEMENT SYSTEMS AS A CATALYST FOR SOCIETAL EMPOWERMENT: A KENYAN PERCEPTIVE

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ABSTRACT

Despite the potential benefits of knowledge management systems (KMS) for societal empowerment, there is limited understanding of how KMS can be effectively implemented and utilized in a Kenyan context to address societal challenges such as poverty, education, and healthcare. This research aims to fill this gap by investigating the impact of KMS on societal empowerment in Kenya and identifying the key factors that contribute to successful KMS implementation. This research examines the impact of knowledge management systems (KMS) on societal empowerment in Kenya. The study employs a qualitative research design, using interviews and case studies to gather data from a sample of Kenyan organizations that have implemented KMS. The findings reveal that KMS have had a positive impact on societal empowerment in Kenya by increasing access to information and facilitating knowledge sharing among individuals and organizations. The use of KMS has also led to improvements in decision making and problem solving, as well as increased innovation and competitiveness. Additionally, the study found that KMS have played a key role in addressing societal challenges such as poverty, education, and healthcare. Overall, the results of this study suggest that KMS can be a valuable tool for promoting societal empowerment in Kenya and other developing countries.

Keywords: *Knowledge Management Systems (KMS), Societal Empowerment, Kenya*

MACRO FACIAL EXPRESSION RECOGNITION AND ANALYSIS USING SUPERVISED 2D-PCA AND LINEAR SVM

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ABSTRACT

Facial expressions are a convenient way of expressing non-verbal communication effectively. The feasibility of this subject has become a dominant area of research in the field of computer vision and artificial intelligence. The applications of facial expression recognition include but not limited to; Human Computer Interaction (HCI), entertainment, consumer feedback systems, health care systems, transport, security, social emojis, emoticons, and avatars. An efficient macro-expression geometric model known as Two-Dimensional Principal Component Analysis (2D-PCA) to extract facial features is proposed in this paper and it utilizes the linear Support Vector Machine (SVM) classifier to group facial emotions. The proposed 2D-PCA model uses Discrete Wavelet Transform (DWT) for feature extraction to extract eigen values from salient frequency domain regions. The extracted eigen values are projected to low pass and high pass filters and transformed into eigen vectors after-which they are forwarded into 2D-PCA for dimensionality reduction and retention of spatial and temporal facial properties. The extracted features are trained and tested using ten folds cross-validation strategy and the SVM classifier finally groups the emotion labels into different expressions. Performance of SVM is evaluated using three kernel functions: linear, Radial Basis Function (RBF), and polynomial kernels. Two benchmark datasets namely, Japanese Female Facial Expression (JAFFE) and Extended Cohn Kanade (CK+) and confidence levels of 97.29% on JAFFE database with six expressions and 90.07% on seven expressions obtained. Using CK+ database confidence level attained were 92.30% on six expressions and 91.1% on 7 expressions. A comparative analysis with other futuristic systems was performed and the proposed 2D-PCA model obtained excellent results.

Keywords: Cross Validation, 2D-PCA, SVM, FER DWT, Kernel Function, CK+, JAFFE

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BIG DATA ANALYTICS FOR SUSTAINABILITY OF SMES' PERFORMANCE AFTER COVID-19 PANDEMIC IN KENYA

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ABSTRACT

The majority of a nation's wealth comes from small and medium-sized businesses (SMEs), which account for half of all jobs and 90% of all businesses worldwide. However, SMEs continue to face limited credit availability from suppliers, who also face liquidity problems, low sales, and high default rates. Advance reimbursement, the weight of punishments on postponed credit installments and other repeating costs have made the SMEs much more helpless. Big Data Analytics for sustainability of SMEs' Performance in Kenya after COVID-19 pandemic was the goal of the study using data analytics and data science. The study's theories are Complex Adaptive System and Strategic Choice Theory. Descriptive survey design was used in the study by the researchers. In each subcounty of Nairobi, the study focused on SMEs in Eastlands, Dagoretti North, Dagoretti South, Langata, Kibra, Roysambu, Kasarani, Ruaraka, Embakasi South, Embakasi North, Embakasi Central, Embakasi East, Embakasi West, Makadara, Kamukunji, Starehe, and Mathare are Nairobi County. In each SME, managers of operations, finance, customer relations, and supply chain was surveyed to obtain data. The Krejcie and Morgan tables was used to gather the 222 respondents for the target population. For the purpose of data analysis, descriptive statistics such as frequencies, percentages, mean, and standard deviation were utilized. The relationship between the variables was determined using multiple regulation and Pearson correlation. Tables, charts, and graphs were used to present the data. The study sought to determine if Data Science has an impact and it was established that, Business Intelligence has a mean of 3.9 (std. dv = 0.851) and Machine Learning a mean of 3.7 (std. dv = 0.928), average mean of 3.8 (std. dv = 0.8895) and all have a positive impact. The study also sought to determine if Data Analytics has an impact and it was established that, Predictive Analytics has a mean of 3.73 (std. dv = 0.850) and Prescriptive Analytics a mean of 3.85 (std. dv = 0.684), average mean of 3.79 (std. dv = 0.767) and all have a positive and significant influence on the Sustainability of SMEs' Performance in Kenya after COVID-19. The SMEs have ability to solve many unforeseen challenges in competitiveness through Data Science drivers such as Business Intelligence and Machine Learning. They were also able to implement legal framework that protects data on Data Analytics on Predictive and prescriptive analysis on the improvement of SMEs performance, survival and growth.

Keywords: *Big Data Analytics, Data Science, Data Analytics, Business Intelligence, Machine Learning, Predictive Analytics, Prescriptive Analytics.*

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SYSTEMATIC LITERATURE REVIEW ON APPLICATION PROGRAM INTERFACE-BASED ANDROID MALWARE DETECTION

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ABSTRACT

Over the years, various malware detection approaches have been proposed in a bid to address evolving malware threats landscape in android operating system. Systematic literature reviews to analyze these detection approaches have been carried out, but none have been tailored to identifying challenges with android malware detection based on the use of Android program interface (API) features. Therefore, there is no aggregated information on what work has been done by researchers in this area. This research, presents a systematic literature review on API feature based android malware detection literatures between 2018 to 2022 collected systematically using PRISMA frameworks. The study identifies the challenges faced in android malware detection over the years, methodologies used to address them and limitations of API based feature detection. These useful insights documented in this research will serve as valuable resources which researchers can leverage on to improve the detection of android malware.

Keywords: - *Android Program Interface (API), PRISMA, Malware, Android Malware.*

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BIVARIATE BASED SUSCEPTIBILITY MAPPING FOR GULLY EROSION IN WANJOGA RIVER CATCHMENT UPPER TANA BASIN, KENYA

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ABSTRACT

Gullies often occur in semi-arid regions characterized by rainfall variability, seasonality and increased overland flow, affecting ecological fragility of an area. In most gully prone areas, extent of land affected by gullies is increasing. Thus, predicting susceptibility to gully erosion in semi-arid environment is an important step towards effective rehabilitating and prevention of gully erosion. Proneness to gully occurrence was assessed against; Land cover/land use, slope, soil characteristics, rainfall variability and elevation, and modelled using GIS-based bivariate statistical approach. The study assessed influence of geomorphological factors on gully erosion, analyzed and developed gully erosion susceptibility map and verified gully susceptibility images using error matrix of class labels in classified map against ground truth reference data. A total of 66 gullied areas (width and depth ≥ ranging 0.5m), were mapped using 15m resolution Landsat images for 2018 and field surveys to estimate susceptibility to gully erosion by Global Mapper software in GIS. The images were verified using 120 pixels of known 15 gully presence or absence to produce an error matrix based on comparison of actual outcomes to predicted outcomes. Influence of conditioning factors to gully erosion showed a significant positive relationship between gully susceptibility and gully conditioning factors with consistency value; CR =0.097; value< 0.1, indicating, individual conditioning factors influenced gully erosion. Slope (43%) and soil lithotype (25%), had most influence on gully susceptibility, while land cover/land use (12%) and rainfall (12) had least impact. Verification results showed satisfactory agreement between susceptibility map and field data on gullied areas at approximately 76.2%, an error of positive value of 4% and a negative value of 7%. Thus, production of susceptibility map by bivariate statistical method represents a useful tool for ending long and short-term gully emergencies by planning conservation of semi-arid regions.

Keywords; *Susceptibility, Gully, Bivariate, Land cover, GIS*

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MODELLING OF DAILY COVID-19 CASES IN KENYA USING A SARIMA MODEL

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ABSTRACT

Severe Acute Respiratory Syndrome is the primary cause of coronavirus disease (COVID-19). The first case was reported in Wuhan, China, on December 30th, 2019 with the first case in Kenya on 13th March, 2020. This contagious disease became a global challenge because it led to millions of deaths, economic disruption leading to loss of employment and economic instability. There was therefore a need to model daily COVID-19 cases in Kenya using the Seasonal Autoregressive Integrated Moving Average (SARIMA) model and forecast. Secondary data from the World Health Organization from 13th March, 2020 to 13th Jan, 2023 using R software. Data was found to be non-stationary using the Augmented Dickey Fuller test and differencing was done to make it stationary. The Box-Jenkins methodology was used in fitting the model to the data and afterwards forecasting was done. The best model was selected as the model with the least Akaike Information Criterion. The SARIMA model was fitted to the daily COVID-19 data then forecasting was done for sixty days. These forecasts will greatly create awareness of the trend and seasonality of this disease and therefore can be useful to the health care providers and the government for purpose of planning, policy formulation and resource allocation.

Keywords: _Covid-19, Sarima, Seasonality, Forecasts_

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AN INVESTIGATION ON DECLINING WATER LEVELS OF RIVER MUTONGA IN THARAKA NITHI COUNTY, KENYA

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ABSTRACT

Variations in river water volumes have direct or indirect effects on biodiversity because sustainable development is highly dependent on availability of adequate water. Global records show declining water levels in most rivers. Most rivers flowing through TharakaNithi County have recorded notable decline in water volumes and this is a major challenge to achieving sustainable development in the County. Knowledge about water volume variations and factors responsible for the variations is key to effective water resource management. This study aimed at establishing extent of water volume decline in river Mutonga, the impact of human water abstraction and effects of climate change on the declining water volumes over the last 30 years. The study adopted a descriptive survey research design. The study corrected primary and secondary data from 270 households' heads, three regional NEMA officials and three regional water resources authority officials. Data was analyzed using descriptive and inferential statistics. A long-term variation in the recorded rainfall in the region in the period between 1990 and 2020 and was associated with the decline in river volume. There was a significant relationship between increased temperatures and river discharge amount (0.639816>0.05). The R square value of 0.8597, shows a significant relationship between the number of intakes constructed to abstract water and the river discharge. It is advisable for County Governments to adapt suitable water management strategies during implementation of development projects that are likely to affect water resources.

Keywords: *Declining Water Level, biodiversity, Sustainable Development, Human Water Abstraction*

HEAVY METALS IN REFINERY WASTEWATER: ASSESSMENT AND TREATMENT USING DIATOMACEOUS EARTH

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ABSTRACT

In refining crude oil, freshwater is applied in various processing units such as distillation, hydration, desalination, and system water cooling. Freshwater is also used in firefighting and other cleaning operations. The Kenya Petroleum Refineries Ltd consumes huge quantities of freshwater daily for various applications leading to generation of contaminated effluents. The effluents contain a cocktail of contaminants such as aliphatic hydrocarbons, polycyclic aromatic compounds, and dissolved gases suvh as H_2S, micro-organisms such as algae, fungi, and heavy metals. Except for the heavy metals, the existing refinery wastewater treatment plant also removes most of the other contaminants form the wastewater through a combination of processes including filtration, coagulation, sedimentation, softening, de-aeration, chlorination, desulfurization, bioremediation, and ion-exchange. These techniques are expensive, generating huge amounts of sludge, and are also not effective for removal of trace levels of heavy metals. Using inductively coupled plasma coupled with optical emission spectroscopy (ICP-OES), the effluents were found to contain significant levels of iron, cadmium, chromium, manganese, nickel, lead, vanadium, and zinc. Diatomaceous earth, a locally available, low-cost adsorbent (Ksh. 5 per kg) was effectively applied to treat the heavy metals to within allowable limits recommended by the World Health Organisation. This study demonstrates that locally sourced diatomaceous earth can be used in treatment of heavy metals in refineries and industrial effluents.

Key words: *Adsorption, Diatomaceous Earth, Heavy Metals, ICP-OES, Refinery Wastewater*

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INFLUENCE OF COMMUNITY FOREST ASSOCIATION ACTIVITIES ON DRYLAND RESOURCES MANAGEMENT: CASE OF KIBWEZI FOREST IN KENYA

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ABSTRACT

Gazetted forests in Kenya are owned and managed by the government through Kenya Forest Service. Other stakeholders including communities formally participate in forest management through Participatory Forest Management, concessions and leasehold. In each management regime, the forest has to be well managed and the community continue accessing forest products. The aim of this study was to investigate whether Community Forest Association activities lead to improved forest cover in a leased forest. The study adopted a descriptive survey design where both qualitative data and satellite data was collected. A sample size of 139 individuals was issued with questionnaires and 5 key informants were interviewed. Satellite imagery was used to quantify changes and trends in forest cover of Kibwezi forest for ten years. Results showed that infrastructural development had a great effect on destruction of forest cover in Kibwezi forest. There was significance relationship between community participation and improvement of forests since Chi square results were (χ^2 =27.631, df=9, 0.001). The improvement of the forest was partially contributed to by presence of community forest association during inception of project but later David Sheldrick Trust which fenced the forest.There should be deliberate action by stakeholders to give community forest association incentives to operate optimally.

Keywords: *Community Forest Association, Leasehold, Forest-Cover, Forest Destruction, Conservation, Incentives.*

DEVELOPING A TECHNO-ECONOMIC MODELING TOOL FOR SMALL SCALE UTILITY SOLAR PV TECHNOLOGY FOR QUANTIFYING ENVIRONMENTAL IMPACTS

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ABSTRACT

Renewable Energy Technologies (RETs), especially Solar Photovoltaics, have seen many plants being constructed to either supplement the national grid or to provide alternatives for those far from the grid. A modelling tool that can quickly and quantitatively assess the effects of this technology in monetary terms would accelerate application of Solar PV technology. We present a modelling tool that determines not only the techno-economic impacts but also the environmental impacts of this technology in monetary terms, for one to enable assessment of viability of a plant in a given region. Solar-PV based Power and Environmental Cost Assessment (SPECA) model was developed to help in; (i) understanding Solar PV based power generation and its interactions with the resource inputs, the private costs, external costs and hence the environmental and social-economic impacts over the lifespan of the plant (ii) aiding investors of Solar PV with a tool with clear graphical and user interface for detection of the main drivers of the Levelized Cost of Energy (LCOE) and (iii) to create an enabling environment for decision-makers aided by a visual SPECA modelling tool which takes into account the financial viability and the environmental impacts of Solar PV.

Keywords: - _Solar PV, LCOE, SPECA_

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CLOUD DATA SECURITY AUDIT REPORT TECHNIQUES USING BAT INSPIRED ALGORITHM (CDSART-BA): A REVIEW

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Abstract: Cloud computing has become an interesting attraction for Information and Communication Technology (ICT) practitioners. It is helping to reduce cost of procuring computing devices and services. To this end, security attacks have been rising with cloud service providers always having to under report the prevalence, in order not to scare away potential cloud service subscribers. In this review, eighty (80) papers were acquired from reputable academic publications using Google Scholar as the search engine. The seventeen (17) carefully selected from the pool of 80, for review, have a total of seventy-four (74) versions on the internet. Furthermore, the authors agree with the research publications, that there is the need to bring on board the client, into security breach mitigation strategies, being developed to strengthen cloud data security. Findings from this review, reveals that research interest in cloud data security audit has increased from four (4) papers between 2011 and 2016, to thirteen (13) papers between 2017 and 2022. These existing frameworks and techniques, are still being tested to improve performance. This research, therefore, proposed a cloud data security audit report techniques using Bat inspired algorithm (CDSART-BA) to improve cloud data security.

Keywords: *Audit Report Techniques, Bat Algorithm, Cloud, Data, Security, Smart Environment.*

ON NORM-ATTAINABILITY OF BOUNDED LINEAR OPERATORS IN HILBERT SPACES AND APPLICATIONS

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Abstract

The study of norm-attainability of operators forms an important aspect in functional analysis, particularly, operator theory and its applications to other disciplines. However, characterizations of norm-attainable operators have not been exhausted. The pending question that remains unanswered is; What are the necessary and sufficient conditions for bounded linear operators to be norm-attainable in a general Banach space setting? Moreover, what are the norms of these operators if the norm-attainability suffices? Therefore, in this paper, we present norms of operators in Hilbert spaces. We outline the theory of normal, self-adjoint and norm-attainable operators. The study seeks to determine norms of normal operators, to establish conditions for norm-attainability of normal operators, and investigate norms of self-adjoint norm-attainable operators. The methodology involved the use of inner products, tensor products and some known mathematical inequalities like Cauchy-Schwarz inequality and the triangle inequality. Results showed that normaloid and normal operators are norm-attainable if there exists a unit vector x in the Hilbert space which is unique such that for any operator T, $\|Tx\| = \|T\|$. Furthermore, the operators are norm-attainable if they are self-adjoint. These results concur with the results of Qui Bao Gao (2008) for compact operators when the Hilbert space is taken to be infinite dimensional and complex. These results are useful in quantum computing in generating quantum bit. In genetics the results are useful in the determination of DNA results of parents and offsprings.

Keywords_: Hilbert Space, Normality, Norm-Attainability, Self-Adjoint Operators, Tensor Products._

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ANALYTIC SOLUTION OF A NONLINEAR BLACK-SCHOLES EQUATION VIA LONG AND SHORT GAMMA POSITIONS

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Abstract

This study presents a nonlinear Black-Scholes equation whose nonlinearity is due to feedback effects. The market involved is illiquid as a result of transaction costs. An analytic solution to the equation via long and short gamma positions is currently unknown. After transforming the equation into a parabolic nonlinear porous medium-type equation, find that the assumption of a traveling wave profile to the later equation reduces it to Ordinary Differential Equations (ODEs). This together with the use of long and short gamma positions facilitate a twice continuously differentiable solution. Both positive and negative gamma exposure can lead to an out-of-the-money option.

Keywords: *Nonlinear Black-Scholes Equation, Illiquid Markets, Transaction Cost, Gamma Position, Analytic Solution*

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ORTHOGONAL IDEMPOTENTS AND CONTINUOUS FREDHOLM OPERATORS UNDER PERTURBATIONS

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ABSTRACT

Let H be an infinite dimensional complex Hilbert space and $F_{OI}(H)$ the set of all Fredholm operators perturbed by orthogonal idempotents in Banach space. The objective of the study is to characterize continuity of Fredholm operators perturbed by orthogonal in Banach spaces. The methodology involved tensor products, direct sum decomposition, spectral decomposition and other fundamental principles. Results contribute to existing body of knowledge in the field of functional analysis, particularly in operator theory and Fredholm theory.

Keywords: - _Fredholm Operator; Continuity; Perturbation; Orthogonality; Idempotency and Banach Space_

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ON DENTABLE SETS AND MAPPINGS

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ABSTRACT

Characterizations of properties of operators in a Banach space setting have been done over many years with interesting results obtained. Dentability of sets and norm-attainable mappings is one of the important properties that have been considered. Most researchers have worked on dentable sets with regard to density of norm-attainable operators. We characterize dentable sets and mappings. This work establishes a link between measure theory, norm-attainability and dentability with the help of Radon-Nikodým Property. It also improves the understanding of optimization problems at a deeper level.

Keywords: *Dentability, Density, Norm-Attainable Class, Optimization, and Norm-attainability.*

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TWO-LAYER SECURED GRAPHICAL AUTHENTICATION WITH ONE TIME PASSWORD (OTP) VERIFICATION FOR A WEB BASED APPLICATIONS

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ABSTRACT

The design in this study suggests a two-layer protected graphical authentication mechanism using OTP for verification so as to increase the security of web-based applications. The suggested procedure calls for using a graphical password as the primary form of authentication and a one-time password (OTP) as a secondary form of authentication. The server will produce the OTP and send it to the user's registered email address or cell phone number. After that, the user will input the OTP to finish the authentication procedure. In a controlled setting, the proposed approach will be used, assessed, and the results will be utilised to assist further study. Web-based applications may be made more secure using the suggested two-layer protected graphical authentication technique with OTP for verification, which can also help safeguard sensitive data from unwanted access. The results show that this research improves related ones regarding memory and time complexities. This study is essential for people, companies, and organisations that use web-based apps to store sensitive data

Keywords: - _OTP, Authentication, Two-Layer Protected Graphical Authentication Technique, Web-Based Apps, Sensitive Data_

A MULT-TASK SYSTEM FOR DETECTION AND CLASSIFICATION OF MALWARE SIGNATURES USING RANDOM FOREST CLASSIFIER

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ABSTRACT

Cyber-attacks are now a major concern for internet users around the world arising quick growth in the use of information technology. These attacks can take many different forms, including phishing, man in the middle attacks, malicious software, and others. We will concentrate on malware attack in this study. The use of applications on the Windows operating system has been significantly hampered by malicious applications using different methods. These attacks include keylogger, ransomware, trojans, and more. It's crucial to recognize and categorize these malicious attacks on Windows operating systems. Therefore, using a random forest classifier, this paper presents a smart system for identifying and categorizing eight types of malware attacks on the Windows operating system. Starting with Virus Share, Virus Sign, and GitHub respiratory, the system gathers signatures of malware attacks on Windows. The first, second, and third pre-processing stages were applied to the malware signatures that were gathered. The creation of a panda is the first step. Using the malware signatures in a data frame, data cleansing and transformation are the topics of the second and third stages, respectively. Performance of the Random Forest Classifier in terms of accuracy, precision, f1-score, and recall are encouraging. Result show that the Random Forest Classifier has an accuracy of nearly 100% for each of the matrix assessment.

Keywords - *Malware signatures, Random Forest Classifier, Windows operating System Matrix Evaluation*

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KEYNOTE SPEAKERS

Prof. Bitange Ndemo

Professor of Entrepreneurship and a Global ICT Technocrat

Conference Focus '*Research collaborations for Africa's economic transformation*Currently the Kenya's Ambassador to Belgium. Previously, Prof. Ndemo has served as the Permanent Secretary of Kenya's Ministry of Information and Communication. He is a global ICT thought leader and an advocate of development strategies leveraging emergent technologies and social enterprise in Africa. He sits on boards of several high-profile organizations and a senior advisor three UN agencies and other non-governmental institutions. His skills, capabilities and experience are varied. They include over 8 years' CEO-equivalent experience as Permanent Secretary in Ministry of Information and Communications for the Government of Kenya, high-level policy development and public administration, university-level teaching, academic research and graduate supervision, design and implementation of curriculum, academic leadership and administration, innovation management and public speaking to mention but a few. He has over 30 years of business, finance and technology expertise gained from my years in Government, Higher Education and the Private Sector. He is widely published in refereed academic journals and also a leading public intellectual offering his expertise as a columnist and commentator in high-quality, cross-cutting media platforms. He has presented numerous keynote speeches and praxis on matters Research, Innovation and Technology.

Prof. Jackie K. Obey

Dean School of Health Sciences, University of Eastern Africa Baraton

Conference Focus '*Research, innovation and technology in managing forensic science, public health and social responsibility*'

Professor Obey is currently the Dean School of Health Sciences, University of Eastern Africa Baraton. As both a lecturer and research scientist, she has served as a departmental head of medical laboratory sciences. Currently she is pursuing her second Ph.D. in public health at the University of Eastern Finland. She has participated in the development and implementation of a Masters program in global health at the University of Eastern Africa Baraton in collaboration with two Finnish universities. She is a grantee of bill and Melinda gates foundation's grand challenges explorations in global health malaria project. She has published several articles in the areas of health research with both local and international scientists on malaria research, antimicrobial activities of plant extracts, natural products and Ebola epidemiology. She has authored and co-authored four books in heath and science.

Prof. Martin Oliver

Professor of Education and Technology at the UCL Institute of Education, UK

Conference Focus '*Emerging role of education technology for reforms and behaviour change*'

Professor Oliver is a part of the senior management team, working as the Pro Director for Academic Development and the lead for Equality, Diversity and Inclusion work. His research focuses on Higher Education, and has explored curriculum design, in-class and online pedagogy, student experience and teacher identity. He was awarded a National Teaching Fellowship by Advance HE, the UK's Teaching Excellence Award for Higher Education; he is a Past-President of the UK's Association for Learning Technology, and has been the editor of journals including Learning, Media and Technology; and Research in Learning Technology."

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