




Mbarara University of Science and Technology PhDs to make a difference in our communities






During the 28th graduation ceremony of MUST, 29 PhDs were conferred. (7 females and 22 males). These were in the fields of Medicine, Science, Technology, Education, Business, Engineering and Governance.




The guest of honor was honor **Dr. Joyce Moriku Kaducu** (PhD). Minister of State for Primary education, and a MUST alumnus. The Chancellor **Prof. Charles Mark Lwanga Olweny** conferred the Degrees and Diplomas. The PhDs briefs are as below:




<p>1.</p>		<p>Name: Violah Mpangwire</p> <p>Research title: Enhancing Adoption of a Unified Identification System for Ministries, Departments and Agencies in Uganda</p> <p>This study examined the technological, organizational and environmental factors that influence the adoption of Unified Identification System (UIDS) among government Ministries, Department and Agencies (MDAs) in Uganda. The study highlights that for a successful and sustainable implementation of the UIDS among MDAs in Uganda, special attention should be focused on addressing the technological, organisational and environmental factors. The study recommends MDAs to define a clear vision and priorities for the UIDS, develop modules that are compatible with the country's telecommunication infrastructure, and streamline the legal status for electronic transactions.</p>
<p>2.</p>		<p>Name: Silver Onyango</p> <p>Research title: Evaluation of Variations in Ambient Particulate Matter (PM₁₀) at Selected Sites in Uganda: A Case of Rubindi, Mbarara, and Kyebando</p> <p>The research highlighted the severity of ambient air pollution at selected sites in Uganda ranging from Rural to Urban sites. The study recommended use of simple solutions to the air quality problem including reduction in open air waste burning, improving grass or pavement covering, reducing biomass consumption. The study has further inspired other studies that are investigating the link between particle pollution and its effects to human and environmental health in Uganda and raised awareness of the severity of particulate pollution.</p>
<p>3.</p>		<p>Name: Wilbroad Aryatwijuka</p> <p>Research title: Ethical behavior, Managerial competencies and supply chain performance of relief aid organizations in Western Uganda</p> <p>The study established that ethical behavior, managerial competencies and accountability are positively and significantly associated with supply chain performance of relief aid organizations in western Uganda. The study provides insights on how relief aid organizations can improve their supply chain efficiency to ensure the relief supplies reach the intended beneficiaries.</p>

<p>4.</p>		<p>Name: Raphael Wangalwa</p> <p>Research title: Ecology, Phytochemical composition, and Bioactivity of <i>Citropsis articulata</i> a threatened Medicinal Plant: Implications for ex-situ conservation in Uganda</p> <p>There is a growing concern of antibiotic resistance, making infectious diseases harder to treat. This study explored <i>Citropsis articulata</i> as a potential source of antimicrobial agents. Findings of this study indicated that <i>Citropsis articulata</i> leaf extracts are effective against bacteria and fungi that cause infectious diseases. Thus, this plant is a potential source of potent bioactive chemicals that can aid in the development of novel antibiotics. Using GIS and Remote sensing technologies, this study also depicted the suitable places for growing <i>Citropsis articulata</i> outside protected areas in Uganda. This knowledge is critical for precision cultivation and domestication of vulnerable medicinal plants at both local and regional scale in a bid to ensure their sustainable use and conservation.</p>
<p>5.</p>		<p>Name: Eliab Horub Kweyunga</p> <p>Research Title: Mathematical models for the dynamics of Banana Xanthomonas Wilt and the Banana Weevil, <i>Cosmopolites Sordidus</i> (Germa) and Control Interventions</p> <p>The study addresses two of the major impediments to banana yield and production in the east, central and southern Africa regions and has serious implications for global food security and household income. Specifically, the study looks at the role of asymptomatic but infectious plants in the persistence of the disease and provides a theoretical framework for the control of the banana weevil by trapping and use of natural enemies.</p>
<p>6.</p>		<p>Name: Geoffrey OGWANG</p> <p>Research Title: The Effect of World Oil Price Shocks on Uganda's economy</p> <p>The study investigated the pass-through effect of world oil price shocks to the domestic pump prices using Structural Vector Autoregressive Model (SVAR) and it revealed an insignificant pass-through effect of world oil price shocks to the domestic pump prices. Further, using Vector Error Correction Model (VECM) to investigate the determinants of oil imports, the study showed that, in both short-run and long-run, Gross Domestic Product (GDP), had a positive effect and do promote oil imports for Uganda. The study recommends establishing a body to regulate the pricing of domestic petroleum products in Uganda.</p>

7.		<p>Names: Ezeonwumelu Joseph Obiezu Chukwujekwu</p> <p>Research title: Biopharmaceutical Evaluation of Bidens Pilosa, Ageratum Conyzoides and Ocimum Suave in Management of Oral Lesions of HIV/AIDS Patients</p> <p>The findings of this research have shown that most of the antibacterial and antifungal agents in the market are being resisted by both oral bacteria and yeasts of HIV/AIDS patients respectively. It simply means that cotrimoxazole can be made toxic or ineffective sometimes when taken together with any of these plants' extracts. Therefore, HIV/AIDS patients visiting and using both pharmaceutical drugs and traditional healer's medicines at the same time should be properly guided on the use of these combinations by health workers, government agencies and other stakeholders to save their lives.</p>
8.		<p>Name: Natumanya Deborah</p> <p>Research title: Electronic examinations framework with free handwriting</p> <p>This research helps improve the electronic examination process, by providing better electronic examination setting, electronic exam attempts with electronic free handwriting, electronic exam marking and storage of results. The research is beneficial to students, lecturers, and university management.</p>
9.		<p>Name: Bashaija Athanansio</p> <p>Research title: Occupational Stress, Hope, Alcohol Use among Secondary School Teachers in Greater Bushenyi, Uganda</p> <p>This study examined associations in the levels of occupational stress, hope, and alcohol use across teachers' socio-demographic characteristics. It further explored the moderating effect of hope on the relationship between occupational stress and alcohol use among secondary school teachers in Greater Bushenyi, Uganda. It is important for administrators of secondary schools to devise means or strategies that enhance hope, minimize occupational stress and alcohol use among secondary school teachers in Uganda</p>

<p>10.</p>		<p>Name: Musa Kayondo</p> <p>Research title: Pelvic organ prolapse in Southwestern Uganda: Magnitude, Trends, Effect on Quality of Life, and Risk Factors for Recurrence after Surgery at Mbarara Regional Referral Hospital</p> <p>Pelvic Organ Prolapse (POP) is one of the Pelvic Floor Disorders (PFDs) that negatively affects the Quality of Life (QOL) of women. This study investigated the magnitude and trends of POP at Mbarara Regional Referral Hospital (MRRH) over a five-year period. Finding of this study show that younger women, and those with postoperative vaginal cuff infection were more likely to experience recurrent prolapse after vaginal repair. We recommend that surgery should be scaled up to improve the QOL. Surgeons should put in place measures that minimize the risk of postoperative cuff infection in order to reduce the risk of POP recurrence.</p>
<p>11.</p>		<p>Name: Otto Trust</p> <p>Research title: Evaluating the Origin of Chemical Anomalies in Am Stars</p> <p>This study revealed that radiative diffusion, combined with turbulent mixing, thermohaline convection, and slow to moderate rotation can account for most of the chemical peculiarities found in these Am stars. The discovery that the basic elements found in stars are the same elements that make up our bodies strengthens our bond with the cosmos. This connection has an impact on our lives, and the awe it inspires is perhaps one of the reasons why astronomy's beautiful images are so popular today.</p>
<p>12.</p>		<p>Name: Nalumansi Irene</p> <p>Research title: Spectrophotometric Method Development for Orthophosphate Anion Quantification in Water Systems</p> <p>There is an overgrowing concern on eutrophication of water systems due to nutrients such as phosphates that arise from industrial discharge, use of detergents, agricultural wastes among others. Excess amount of phosphates in water lead to increased algal growth resulting into suffocation, fish kills and other related effects of eutrophication, hence the need to monitor quality of water systems using simple and accurate methods. The standard method of orthophosphate anion determination uses ascorbic acid reducing agent.</p>

13.		<p>Name: Baguma John Muhunga Kule</p> <p>Research title: Control environment, Credit Management Systems and Financial Performance of Savings and Credit Cooperatives in Mid-Western Uganda</p> <p>The findings of this study indicate a strong positive and significant relationship between Control Environment and Financial Performance. The study further found that accountability plays a mediating role in the relationship between Control Environment and Financial Performance of SACCOs in Mid-Western Uganda. The study recommends that managers of SACCOs should further the design and implementation of an effective control environment by ensuring that integrity and ethical values are upheld.</p>
14.		<p>Name: Mercy Gladys Tenywa</p> <p>Research title: Standardization of <i>Dracaena steudneri</i> Engl. As A Remedy for Pain Relief During Childbirth</p> <p>Pain during childbirth has been known to be severe and has a lot of implications like mortality, complications and also has caused many to avoid the giving of birth due to its severity. However, <i>Dracaena steudneri</i> plant has got pain relieving activity (analgesic), inducing activity (oxytocic) which will help the expectant mothers during labour/child birth. It is orally administered whereby there is no need for a medical personal/birth attendant, its available and minimizes costs.</p>
15.		<p>Name: KYALIMPA Paul</p> <p>Research title: Leadership Competences and sustainable funding of Local Non-Governmental Organizations in Uganda</p> <p>The study established a leadership framework and tools to aid recruitment and evaluation of NGO leaders with competences requisite to effectively mobilize and efficiently manage resources to guarantee financial independency of local NGOs. The study recommends capacity building and mentorship to NGO leaders in competence areas that foster sustainable funding. Further policy recommendations for favorable government policy on tax exemptions on local NGO income generating ventures and contributing businesses to cultivate a fertile business and fundraising environment.</p>

<p>16.</p>		<p>Name: Rwakihembo John</p> <p>Research title: Corporate Governance and Financial Performance of Private Limited Companies in Central and Western Uganda</p> <p>The empirical findings of this study, depict the urgent need for managers to intensify efforts aimed at ensuring that companies are highly accountable and transparent to their stakeholders and maintain a good reputation as a way of survival in the market. Shareholders should ensure that the boards of their companies bear dynamic characteristics such as an appropriate number of members, non-executive directors, independent audit committees and segregation of the roles of the chairman board and the CEO</p>
<p>17.</p>		<p>Name: Ajayi Clement Olusoji</p> <p>Research title: Development of Pharmacopoeial Standards for Azadirachtaindica, Cymbopogoncitratus, Moringaoleifera, Tithoniadiversifolia and Vernoniaamygdalina Antimalarial Plants in Uganda</p> <p>The absence of official recognition of the use of antimalarial plant remedies in the health care delivery system in Uganda and other African nations has been partly attributed to the lack of quality and safety standards, despite the wide use of these plants. Therefore, this work involved carrying out several standardization experiments and provided botanical and chemical parameters, antimalarial potencies, toxicity profiles, and other useful standards for five Ugandan antimalarial plants. This study confirmed the pharmacognostical parameters for the first time, phytochemical and biological parameters of these plants in Uganda for the development of monographs which then qualify for incorporation into the first edition of Ugandan Herbal Pharmacopoeia.</p>
<p>18.</p>		<p>Name: Andrew Lukyamuzi</p> <p>Research title: Application of Machine Learning in Tracking Food Insecurity</p> <p>Machine Learning allows development of models capable of learning from datasets and this offers benefits such as flexibility, creativity, extraction of complexity patterns, and high performance. The research findings apply to ministry of Relief, Disaster Preparedness, and Refugees in Uganda. While the policy document from the ministry embraces IT application to enhance ministry's activities, it is silent on harnessing Machine Learning. This study implores the relevant ministries to embrace Machine Learning as a computational technique that can enhance tracking of food insecurity.</p>

19.		<p>Name: Nuwagira Catherine</p> <p>Research title: Propagation and Growth Performance of <i>Schkuhria Pinnata</i> L., for Optimal Phytochemical Contents and Antimalarial Activity in Western Uganda</p> <p>This study investigated the agronomical soil nutrient status and how it relates to agro-morphological traits of <i>Schkuhria pinnata</i>. Results showed that <i>Schkuhria pinnata</i> grows best in slightly acidic to neutral, sandy loam, non-saline soils of Kasese in Western Medium-High Farmland. The first-time viable <i>in vitro</i> propagation protocol was developed. For maximum phytochemicals and better antimalarial activity, local communities could consider harvesting <i>Schkuhria pinnata</i> at the flowering stage.</p>
20.		<p>Name: Micheni Lisa Nkatha</p> <p>Research title: Phylogeography, Transmission Dynamics and Drug Susceptibility patterns of <i>Mycobacterium tuberculosis</i> isolated from persons with Pulmonary Tuberculosis in Southwestern Uganda</p> <p>The strain-to-strain diversity of <i>Mycobacterium tuberculosis</i> complex (MTBC) can have phenotypic implications such as transmissibility and treatment effectiveness. Findings of this study indicate a high genetic diversity of MTBC strains circulating in Southwestern Uganda with the Ugandan genotypes accounting for the larger proportion of the cases. Majority of pulmonary tuberculosis cases are due to reactivation and infections with multiple <i>Mycobacterium tuberculosis</i> complex strains are more prevalent among the newly diagnosed patients while multidrug resistance is significantly more among the relapsed patients.</p>
21.		<p>Name: Ikiriza Hilda</p> <p>Research title: Diversity, Phytochemical Profile and Micropropagation of Anantifertility Medicinal Plant (<i>Dioscorea Bulbifera</i>) in Uganda</p> <p><i>Dioscorea bulbifera</i> is an important medicinal plant which grows in the wild forests of Uganda. The plant is at a high risk of extinction due to the high demand of diosgenin, a steroidal saponin which is a main precursor for production of synthetic steroidal hormones. Findings showed that <i>Dioscorea bulbifera</i> accessions from low altitude forests were found to have the highest quantities of diosgenin (anti fertility metabolite) and therefore such forests should be considered for future venture into industrial production of diosgenin in Uganda. <i>Dioscorea bulbifera</i> plant can also be considered in formulating a natural herbal contraceptive.</p>

22.



Name: Alonga Lina Sara Mathew

Research title: Safety Profiling of Traditional Antimalaria Plant, *Aristolochia Bracteolata* Lam. Commonly Used Among Communities of Jubek State, South Sudan

The study investigated the safety profile of *Aristolochia bracteolata* an antimalarial plant found in South Sudan. Findings of this study demonstrated that the plant caused mild adverse effects on the liver function, however, there was no significant adverse effect on kidney function tests. The histopathological examination of all the harvested organs exhibited no significant lesions. Therefore, just like it is with all drugs, the toxic effects of *Aristolochia bracteolata* extracts could be dose dependent. This plant could be a good option for malaria treatment if supported with further clinical trial and product development studies.

23.



Name: Emanuel Peter

Research title: Herbal Formulation using *Momordica charantia* and *Abelmoschus esculentus* for Glycemic Control

Fruits of *Momordica charantia* and *Abelmoschus esculentus* plants have scientific evidence of their antidiabetic efficacy but remain underutilized due to insufficient standardization. In light of this problem, this study developed a standardized solid dosage form containing the two plants for glycemic control. A binary mixture of *Momordica charantia* and *Abelmoschus esculentus* fruit extract resulted in a stable, safe, and efficacious herbal capsule dosage form. Local communities and policymakers could utilize our study findings to promote these plant species' production and utilization as adjunct preparations for type 2 diabetes mellitus.




24.





Name: Mushagalusa Kasali Félicien

Research title: Phytochemical and Pharmacological Study of *Chenopodium ambrosioides* and *Physalis peruviana* , herbs used to treat diabetes in Congolese Traditional Medicine

Diabetes mellitus remains a public health problem in many developing countries. Herbal remedies are gaining popularity because of several advantages. Findings of this study demonstrated that the antioxidant activity of fractions was more pronounced than α -glucosidase inhibition. However, compounds from *Chenopodium ambrosioides* presented good α -glucosidase inhibition and those from *Physalis peruviana*, more substantial antioxidant property. These plants demonstrated the antidiabetic potential in rats, explaining their use as an antidiabetic remedy locally.

<p>25.</p>		<p>Name: Agasha Ester</p> <p>Research title: Capital Structure, Credit Risk Management and Loan Portfolio Quality of Microfinance Institutions in Uganda</p> <p>The findings of this study, indicate the presence of cost of capital acts as a channel in the association between capital structure and loan portfolio quality in Microfinance Institutions. The study also confirmed that the presence of quality clients cannot be underestimated if a healthy loan book is to be achieved. Microfinance Institutions should keenly assess the terms and conditions of funds as well as have strong systems with new innovative ways to strengthen credit risk management efforts.</p>
<p>26.</p>		<p>Name: Abiriga Faustine</p> <p>Research title: Assessing the impact of Equatorial Plasma Bubbles on the performance of GNSS Applications</p> <p>Equatorial plasma bubbles (EPBS) are an ionospheric phenomenon near the Earth's geomagnetic equator at night time. They affect radio waves by causing varying delays. This study revealed that the occurrence of the different categories of EPBs and the patterns of signal scintillation events over this region follow a diurnal and seasonal pattern. The occurrence of the EPBs was also seen to be dependent on solar activity. It was also observed that the East African region experienced a higher percentage occurrence of amplitude scintillation events compared to phase scintillation events.</p>
<p>27.</p>		<p>Name: Asiimwe Frank</p> <p>Research title: Corporate governance practices and performance of cities: the comparative case of Kampala capital city authority and the city of Kigali</p> <p>This study examined the contribution of governing rules, accountability and leadership collaboration to better understand policy implementation, infrastructure development and service delivery in the two cities of Kamala and Kigali. The study recommends that for KCCA and CoK to have better policy implementation, infrastructure development and service delivery, they need more responsive city governance (RCG) that promotes responsiveness, participation of city residents and effectiveness in all city operations. Implementing RCG will enable the two cities to avoid unnecessary central government interference, promote responsibility and accountability among city governing agencies and develop a culture of good collaboration, which will enable them to achieve their performance goals and enhance the wellbeing of city dwellers.</p>

28.		<p>Name: Emmanuel Ahishakiye</p> <p>Research title: A Dictionary Learning Approach for Image Reconstruction in Low Field Magnetic Resonance Imaging</p> <p>The empirical findings of this study, revealed that dictionary learning methods are very fast and less computationally expensive and may therefore be suitable for resource-constrained environments when compared to deep learning methods. Experimental results with the developed algorithms on the peak signal-to-noise ratio (PSNR), signal-to-noise (SNR), reconstruction time (in seconds), and high-frequency error norm (HFEN) revealed better image reconstruction results when compared to the current state-of-art dictionary learning algorithms.</p>
29.		<p>Name: Ndayambaje François Xavier</p> <p>Research title: The Metabolic Syndrome in Rwandan Patients with Epilepsy: Epidemiology and Risk Factors</p> <p>This study investigated the prevalence and incidence of the metabolic syndrome and risk factors in adults with epilepsy, emphasizing on their respective anti-epileptic drug therapies. Findings of this study highlight that the prevalence and incidence of the metabolic syndrome is high among Rwandan patients with epilepsy. Therefore, physicians are advised to carefully select the type of anti-epileptic drugs administered and request regular anthropometric as well as laboratory checkups for patients with epilepsy who are on medications in order to predict a diagnosis of the metabolic syndrome and the complications thereof.</p>

Compiled by Angella Nakato PRO MUST