



NEWSLETTER

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African Centres of Excellence



Headlines



ACEITLMS publishes two hundred ninety-nine (299) research papers

For the implementation of its mission of strengthening human capacity to deliver research-based quality teaching and learning of mathematics and science, ACEITLMS students and associate members published Two hundred ninety-nine (299) research papers in different international journals, since its establishment, and among them one hundred sixty-one (161) are in journal indexed by Scopus.

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UR's ACEIoT empowers youth with AI, Internet of Things training for thriving ICT careers

The University of Rwanda's African Centre of Excellence in Internet of Things (ACEIoT) in partnership with JICA Rwanda, Kobe Institute of Computing (KIC), and DCD Japan International, concluded a six-month training programme dubbed ICT human development initiative for business development.

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15 innovators pitched their innovative ideas for incubation at the ACEDS' Data Driven Incubation Hub

Fifteen young innovators with innovative ideas and prototypes in the fields of Agriculture, Health and Climate pitched to a panel of experts in the field. All these ideas use Artificial Intelligence (AI) to solve problems facing the community in those selected priority areas.

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ACE-DS held its 11th PhD Symposium to assess candidates' research progress

From 25th to 30th September 2023, the African Centre of Excellence in Data Science held its 11th PhD research symposium in which students presented their research progress to their supervisors and co-supervisors.

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ACE-ESD graduates share their experience after they graduate.

Graduates who have graduated from the three programs thought at the African Centre of Excellence in Energy for Sustainable Development (ACEESD) have expressed satisfaction towards the skills they got vis a vis the labor market which help them to be highly competitive in energy sector.

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UR's ACEIoT empowers youth with AI, Internet of Things training for thriving ICT careers



Trainees and officials from CST, ACEIoT, JICA pose for a group photo

The University of Rwanda's African Centre of Excellence in Internet of Things (ACEIoT) in partnership with JICA Rwanda, Kobe Institute of Computing (KIC), and DCD Japan International, concluded a six-month training programme dubbed ICT human development initiative for business development.

The ceremony marking the completion of the training was held on Wednesday, August 23 and was attended by delegates from Japan namely Kawanami Tadakazu, Vice Chairman of Kobe City Assembly, Fukuoka Kenji, Director of Kobe Institute of Computing, Miyashita Takayuki, Former Ambassador of Japan to Rwanda, Shotsuka Minako, Representative of JICA in Rwanda and Burundi, alongside other key stakeholders.

The training, which included Internet of Things (IoT) and Entrepreneurship courses, aimed to empower Rwandan youth and promote employment opportunities within the country's growing ICT industry. Aiming to address the government's

aspiration for youth-led job creation, this collaborative effort seeks to capitalise on the tech-driven era, particularly in fields like Artificial Intelligence and Internet of Things.

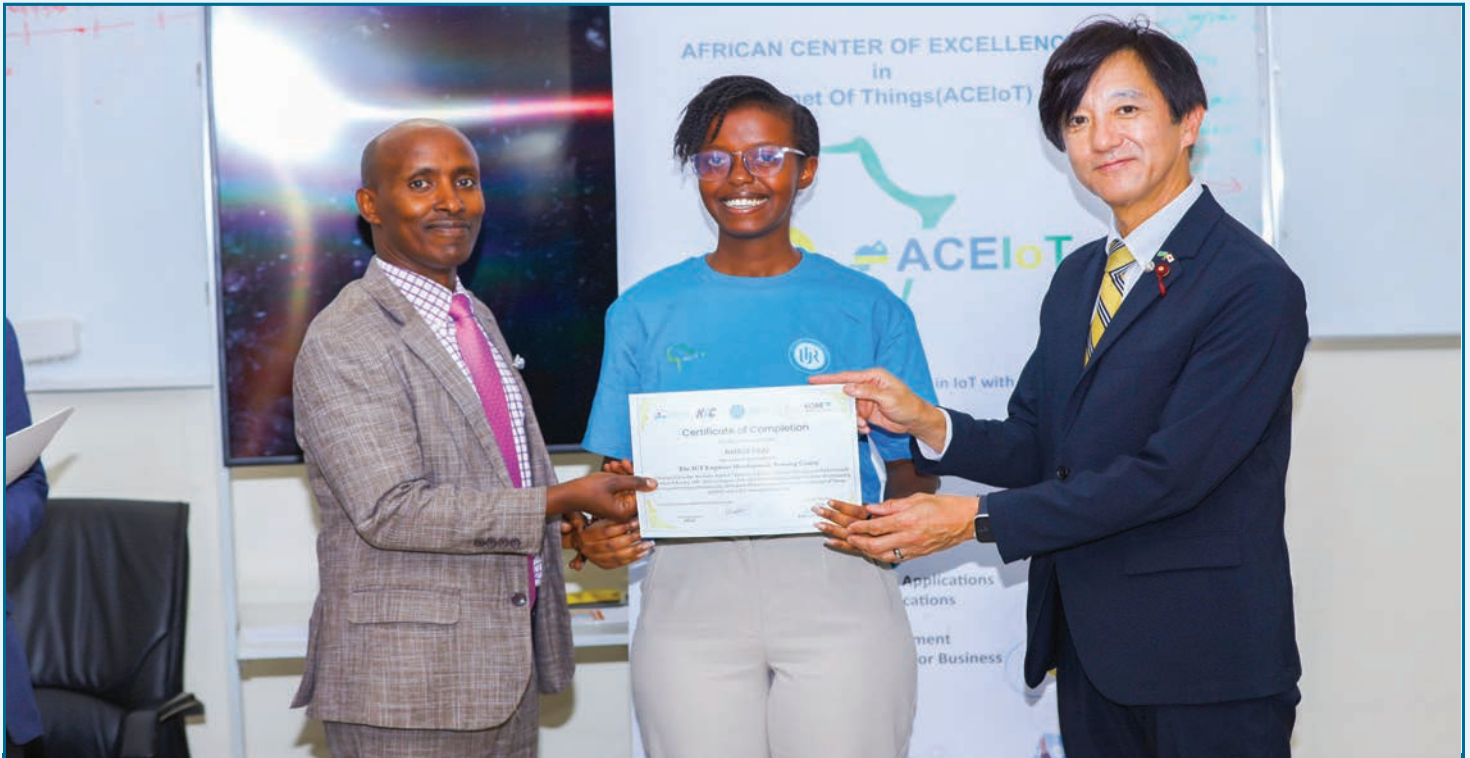
In his remarks Principal of UR's College of Science and Technology Dr Ignace Gatware said: "This training centred around entrepreneurship with the aim of bolstering employability, and it seamlessly resonates with one of UR's 10 graduate attributes; enhancing employability and career development."

"We expect that the skills acquired by these trainees will be channelled towards addressing societal challenges, becoming proactive solution providers, and assuming roles as responsible agents of change. We encourage you to continually add value to your communities and perpetuate innovation," Gatware said.

Conversely, Kawanami Tadakazu, Vice Chairman of Kobe City Assembly, commended the existing partnership with University of Rwanda and assured the continued support to different development projects.

In a press interview, Damien Hanyurwimfura, Associate Professor and Acting Director of ACEIoT, emphasised the relevance of the training in light of the government's push for youth-led job creation. He stated, "Our government wants youth to create jobs, especially in tech. That's why these training sessions are relevant. This is the age of AI and IoT. The skills imparted ensure a comprehensive understanding of these fields, and we actually want them to create jobs after this – start-ups, and more."

Hanyurwimfura added, "We're trying to establish a new centre here dedicated to following up on their ideas and nurturing them to fruition. Young Africans have the potential to innovate in the tech space, and hopefully, we'll see an increase in 'Made in Rwanda'.



One of the trainees receiving a certificate of completion

products aimed at solving citizens' problems. We had two cohorts, and one more remains to be trained to complete the project."

One of the trainees, Penine Ngizwenayo, a fresh graduate in Computer and Software Engineering, shared insights into the practical impact of the training.

She said, "We surveyed and ventured into local communities to identify the challenges they face. Following this, we thoroughly analysed the gathered data and applied our training expertise in IoT and AI to devise innovative solutions."

"Take our group as an example – noticing the recent disasters that have affected Rwanda, we developed an alarm system designed to mitigate floods. Our

project aims to detect areas at risk of disasters, particularly floods. Citizens would receive alerts through buzzers, flashing lights, and phone notifications, all tailored to the level of risk. Our system, strategically positioned near rivers, monitors water levels and promptly notifies or alarms individuals when the water level reaches a critical point. With adequate funding and guidance, this initiative has the potential to significantly benefit numerous people," Ngizwenayo said.

The programme catered to diverse participants, including six master's students from ACEIoT, seven University of Rwanda alumni, and six undergraduate ICT students, totalling 19 trainees hailing from countries including Malawi, Chad,

DR Congo, and Rwanda.

It is funded by JICA Rwanda and it runs in ACEIoT, facilitated by KIC Alumni in Rwanda and KIC professors.

The trainees also collaborated on group projects that showcased their innovative problem-solving skills, and stakeholders at the event expressed their intention to sponsor selected projects from this intake.

Before the ceremony delegates from Japan met with the Principal of College of Science and Technology Dr. Ignace Gatere. They discussed existing collaboration with University of Rwanda and how to enhance it.

15 innovators pitched their innovative ideas for incubation at the ACEDS' Data Driven Incubation Hub



Experts from different fields were present to assess different ideas

Fifteen young innovators with innovative ideas and prototypes in the fields of Agriculture, Health and Climate pitched to a panel of experts in the field. All these ideas use Artificial Intelligence (AI) to solve problems facing the community in those selected priority areas.

This pitching event took place on 22nd August, 2023. The main purpose of this event was to allow the innovators to get comments and inputs from experts in those domains to finetune their ideas before they are incubated.

During the pitching workshop, innovators pitched their ideas in front of experts in these fields for the experts to give them comments on how to improve their ideas before they can be incubated at the Data-Driven Incubation Hub at African Center of Excellence in Data Science.

“After pitching, the most promising projects will be incubated for six months getting coaching and mentorship from experts in their fields till the project becomes a viable product that can be commercialized.”, said Dr. Jennifer Batamuliza, the Head of Data Driven Incubation Hub.

During the six months' incubation period, the selected incubatees will be provided with different trainings that will lead them from ideation to commercialization stage.



One of innovators pitching her innovative idea

The incubatees will be provided with mentors who will support and train them, demo days will be organized for the incubatees, pitching to potential investors, building networks for entrepreneurs, innovation week to showcase ideas to industries and funders, how to brand their products, how to design and develop their solutions and train them about intellectual property among other skills.

Data Driven Incubation Hub (DDIH) was established in 2022 at the African Centre of Excellence in Data Science with an aim of transforming ideas into real-world solutions turning brilliant ideas from conceptions to commercialization and connecting created data-driven solutions to the industry/institutions for informed decision-making

Who are ACEs PhD candidates to graduate this year

On 17th November 2023, UR will host the Graduation ceremony where more than 8000 undergraduate and postgraduate students will get their degrees. Among them, 30 PhD candidates and 172 Master's students are from the Four Centres of Excellence. They include: 37 MSc and 5PhD from ACE-ESD; 57MEd and 18PhDs from ACE-ITLMS; 39Msc and 4PhD from ACE-IoT, 39 Msc and 3 PhD from ACE-DS. **The following are 30 PhD candidates and their research topics:**

ACEITLMS



Mrs. Stella Teddy Kanyesigye

Impact on Problem Base Learning on Academic Achievements, Conceptual understanding and Attitude toward Mechanical Waves among secondary school students in Mitooma District, Uganda

ACEITLMS



Mrs. Flavia Beichumila

Bridging the gap between Pedagogy and Technology: The Effects of Computer simulations and Animations in Developing science Process Skills among Tanzanian students

ACEITLMS



Mrs. Pascasie Nyirahabimana

Multimedia Usage and its Effect on Teaching and Learning Quantum Physics at University of Rwanda

ACEITLMS



Mrs. Marie Sagesse Uwurukundo

Integration of GeoGebra in Teaching and Learning Geometry among Selected Upper secondary schools in Rwanda

ACEITLMS



Mrs. Celine Byukusenge

Effect of Virtual laboratories in Teaching and Learning Biology Difficult topics in Upper level Secondary Schools in Rwanda

ACEITLMS



Jeannette Musengimana

Effect of task-based learning on students 'achievement and attitude in chemistry at lower secondary schools, Rwanda

ACEITLMS



Emmanuel Bizimana

Effects of concept mapping and cooperative mastery learning on students' achievement, attitudes, and concept retention in biology among secondary schools of Nyamagabe District, Rwanda.

ACEITLMS



Sibomana Aimable

Effects of Cooperative Learning on Students' Achievement, Knowledge Retention and Attitude towards Chemistry among Upper Secondary Schools, Rwanda

ACEITLMS



David Opanga

Effect of English as language of instruction on teaching and learning of invertebrates in Tanzania: Case of secondary schools in Dodoma Region

ACEITLMS

**Kibga Esther**

Effect of Hands-on Activities Using Locally Designed Learning Materials on O-Level Chemistry Learners' Curiosity and Problem-Solving Skills in Selected Community Schools in Dar es Salaam, Tanzania

ACEITLMS

**Adejimi Saheed Ayodeji**

Comparative Investigation of Two Innovative Collaborative Instructional Strategies on Secondary School Students' Learning Outcomes in Biology in Oyo State, Nigeria

ACEITLMS

**Mboniyirivuze Agnes**

The Effect of Peer Instruction on Students' Performance in Electricity and Magnetism in Selected Rwandan Secondary Schools

ACEITLMS

**Gabriel Janvier Tugirinshuti**

Video-Based Multimedia and Its Effect on Students' Achievement in Physics in Upper Secondary Schools in Rwanda

ACEITLMS

**Christian Bob Nicol**

The Impact of Inquiry and Demonstration-based Chemistry Experimentations on the Academic Performance of Grade Eleven Students in Bong County, Liberia

ACEITLMS

**Dorimana Aline**

Enhancing Secondary School Learners' Mathematical Problem-solving Abilities Through Problem Based Learning

ACEITLMS

**Edwin Byusa**

Effect of Activity-Based Techniques on Teaching and Learning Chemistry in Gasabo Secondary Schools, Rwanda

ACEITLMS

**Mukagihana Josiane**

Effect of Resource-Based Instructions on Pre-Service Biology teachers' Attitude, Motivation and Academic achievement in Higher-learning Institutions in Rwanda

ACEITLMS

**Mr. Josephat Paul Nkaizirwa**

"The effect of inquiry-based learning on environmental knowledge and attitudes among pre-service biology teachers in selected teacher colleges, Tanzania."

ACE-ESD



Godwin Norensa Osarumwense Asemota

Optimization Algorithms for Electricity Load Management

ACE-ESD



Enock Lumuliko Chambile

Life Cycle Carbon Emission Modelling of Electrical Power Systems: the case of Kenya

ACE-ESD



Kavuma Chrish

Investigation of Solar Energy Integration options into the Ugandan Electricity Grid

ACE-ESD



Mr. Prosper Ndizihiwe

Algorithm for Determining Stoichiometric Ratio for Thermal Plant Fuels Considering Species and Properties as well as Alternatives

ACE-ESD



Mr. Daniel Mburamatatare

Electricity Supply and Impact on Energy-Intensive Industries: Case Studies of Rwanda, Uganda, Tanzania and Kenya

ACE-DS



Mr. Dominique Habimana

Measuring the Effects of Unconditional Cash Transfers, Public Works and Microcredit Programs in Rwanda

ACE-DS



Mr. Mohammed Semakula

A spatial-temporal and Statistical Prediction Models of Human Infectious Diseases in Rwanda

ACE-DS



Obvious Nhimunya Chilyabanyama

Characterizing Linear Growth and Predicting Stunting Among Children in Zambia: A Statistical and Machine Learning Analysis

ACE-IoT



Mr. Eric Hitimana

Analysis and Performance Enhancement of IoT Framework for Fire Incidence Application

ACE-IoT



Mr. George Yogo Odongo

IoT-enabled Fault Prediction and Location Discovery Platform for the Electrical Power Distribution System

ACE-IoT



Mr. Farian Severine Ishengoma

Integrated Drone Technologies and Machine Learning Techniques for Early Detection of Fall Armyworm in Maize Fields

ACE-IoT



Mrs. Irene Niyonambaza

IoT-based Predictive Maintenance for Medical Equipment Using an Integrated Advanced Analytics (IAA) Model

ACEIoT trains beekeepers on Smart Hive Technology to multiply produce



Bees keepers and trainers pose for a group photo after training

The University of Rwanda's African Center of Excellence in Internet of Things (ACEIoT), established at the College of Science and Technology a specialized training session for beekeepers associated with beekeeping cooperatives in Huye and Nyaruguru districts from July, 21 to 23.

This training is one of key activities under the project funded by International Centre of Insect Physiology and Ecology (ICIPE), implemented in partnership with NARADA Electronics Limited.

The main focus of this training was to introduce the beekeepers to the Smart Bee Hive Technology (SBHT) device, which has been specifically developed to enhance their beekeeping activities and ultimately boost honey production.

Elias Ntawuzumusi, a doctoral student at the African Centre of Excellence in Internet of Things, brought the idea of introducing IoT in bees keeping through which the

SBHT device was developed in the ACEIoT in collaboration with NARADA LTD.

According to him the SBHT device is an innovation that monitors various essential elements within the beehives.

"It can track temperature, humidity, sound, movement inside and outside the hives, bee colonies' lifestyle, and more. By utilizing sensors, beekeepers can remotely control these parameters through their smartphones. The device is equipped with a digital siren to deter animals and intruders, smoke detectors to notify beekeepers of forest fires, and an air ventilation system to protect bees exposed to harmful external air," he said.

Explaining the inspiration behind the project, Ntawuzumusi emphasized the significance of honey for health and recognized the untapped potential in Rwanda's beekeeping industry.

He conducted extensive surveys and consultations with beekeepers from Huye and Nyaruguru Districts, identifying their challenges and needs, which played a vital role in developing the SBHT device.

Damien Hanyurwimfura, Associate Professor and Acting Director of ACEIoT, who is the Principal Investigator of the project highlighted the collaborative effort with NARADA Ltd to ensure the device's viability and sustainability in Rwanda.

The device's affordability and solar-powered design make it an eco-friendly and economically viable option for beekeepers.



Bees keepers pose with the innovated technology

"With the SBHT, beekeepers can now take precise actions to regulate temperature and humidity, manage colonies effectively, and ensure optimal conditions for honey production," Mukanzayire said.

With funding from the International Centre of Insect Physiology and Ecology (ICIPE), the African Center of Excellence in Internet of Things (ACEIoT) at the University of Rwanda has been working on the "Smart Bee Hive Technology" project for the past two years.

Through the partnership with Africa Regional Scholarship and Innovation Fund (RSIF) for applied sciences, engineering, and technology, knowledge of the device has already been disseminated to more than 20 beekeepers.

"The device will undoubtedly have a significant impact on honey production as it addresses all the essential elements critical to successful beekeeping, while also providing timely alerts to beekeepers whenever issues arise. Furthermore, our commitment to fostering innovation extends beyond the development of the Smart Bee Hive Technology," he said.

"At our university, we have established an incubation hub that nurtures the creative ideas of our doctorate students. Through this

initiative, we are actively seeking opportunities to collaborate with industry players, allowing us to bring these inspiring projects to life and apply them for the betterment of the Rwandan community and beyond," Hanyurwimfura said.

For beekeepers like Tantina Mukanzayire from Nyaruguru District, the SBHT technology offers a transformative solution. The device addresses key issues such as lack of adequate information about hive conditions, theft of honey produce, and colony health monitoring.

ACE-ESD graduates share their experience after they graduate



Eng. Fabrice Dukuzumuremyi graduated in Electrical Power System, now employed at Shema Power Lake Kivu (SPLK).

Graduates who have graduated from the three programs thought at the African Centre of Excellence in Energy for Sustainable Development (ACEESD) have expressed satisfaction towards the skills they got vis a vis the labor market which help them to be highly competitive in energy sector.

These students who, most of them are already employed have described the programs as marketable, highly needed and contributing to energy sector in Rwanda.

"The skills I got are helping me to understand, analyze and be aware of what is happening in the power systems especially systems I am working on at Kivu Watt Project", said Kwitonda Alphonse who works at Kivu Wat Project, a project extracting Methan Gas in Lake Kivu.

After graduating, a good number of students have got jobs. Although some may not be paid for the degree, they have but their skills make them highly wanted compared to others they might be competing with.

"There is no loss for any acquired knowledge because we never know exactly what the future holds for us. Learn as much as you can, acquire as much as you can. I am a witness for this," said Eng. Fabrice Dukuzumuremyi

who graduated in Electrical Power System, now employed at Shema Power Lake Kivu (SPLK). Some of the institutions which have hired these students appreciate they

skills they brought to their organizations. Leonard Manirambona, the Deputy Principal of IPRC Karongi said their staff who are graduates from ACEESD are contributing to the increase of reputation of Rwanda Polytechnic in terms of research and innovations.

"For instance, our staff, who is one of ACE-ESD graduates was one of presenters in the last IEEE 2022 conference held in Kigali-Rwanda",

he noted, adding that not only this but also, he has improved his academic performance due to new skills acquired from the Centre.

The African Centre of Excellence in Energy for Sustainable Development has so far graduated 112 Master's and 4 PhD students. 37 Master's and 5 PhD students are expected to graduate this year.

6 PhD candidates, 31 MEd students successfully defended their theses in quarter one of 2023-2024

6 PhD and 31 master students from African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) have successfully defended their theses making a round of 18 PhD and 57 MEd graduands to graduate this year. They are from the four specialisations namely Biology education, Chemistry education, Mathematics education and Physics education.

Here are details about PhD theses:

1.PhD Candidate: Mrs. Marie Sagesse Uwurukundo

Thesis title: Integration of

GeoGebra Software in Teaching and Learning Geometry among Selected Upper Secondary Schools in Rwanda

2.PhD Candidate: Mrs. Celine Byukusenge

Thesis title: Effect of Virtual Laboratories in Teaching and Learning Biology Difficult Topics in Upper-Level Secondary Schools in Rwanda.

3.PhD Candidate: Mrs. Stella Teddy Kanyesigye

Thesis title: "Impact of Problem Based Learning on Academic Achievement, Conceptual Understanding and Attitude

Towards Mechanical Waves among Secondary School Students in Mitooma District, Uganda."

4.PhD Candidate: Mrs. Flavia Beichumila

Thesis title: "Bridging the Gap between Pedagogy and Technology: The Effects of Computer Simulations and Animations in Developing Science Process Skills among Tanzanian Students."

5.PhD Candidate: Mrs. Pascasie Nyirahabimana

Thesis title: "Multimedia Usage and its Effect on Teaching and Learning Quantum Physics at the University of Rwanda."

ACEIoT PhD student develops AI platform to provide expert advice to farmers



Theofrida Maginga explaining her technology

Theofrida Maginga, a PhD candidate at the African Center of Excellence in Internet of Things (ACEIoT) at the University of Rwanda (UR) specializing in Embedded Computing Systems is in advanced stages of developing a ChatGPT-powered Swahili chatbot that will help smallholder farmers detect crop diseases quickly and easily.

Dubbed 'Mkulima GPT', it will integrate Artificial Intelligence (AI) with Internet of Things (IoT) technologies to support farmers with useful agricultural information in a culturally-sensitive manner.

It is funded by Bill and Melinda Gates Foundation and was developed in collaboration with Dr. Jimmy Nsenga, an affiliated honorary lecturer at the ACEIoT.

With this technology, smallholder farmers with limited literacy and scarce resources will be able to quickly and easily detect the crop diseases such as Northern Leaf Bright. The team will also integrate artificial intelligence (AI) and Internet of Things (IoT) and use non-invasive sensors to monitor non-visual early disease indicators



Theofrida Maginga's technology

including volatile organic compounds (VOCs), ultrasound movement and the uptake of soil nutrients.

Speaking to The New Times, Maginga compared the platform to “a virtual extension officer.”

“We are bringing a virtual extension officer with the assistance of the Chat GPT model, which is a very famous application right now. The farmer can get advice in real time and can be able to communicate with the technology in the local language,” she said.

The project is currently in its testing phase, where the developers are encouraging potential consumers to try it out and provide feedback on what can be improved.

It already has a website and a dedicated WhatsApp phone number to which farmers can send their queries either by text or audio, in Swahili or English, to get information

regarding how they can prepare their farms, maize disease management, post-harvest procedures, and so on.

After getting the funding, both researchers are now collecting as many questions and answers as possible that originate from farmers themselves which will be stored in a database and will be reproduced in terms of questions and answers as if farmers were communicating with extension officers.

“We have the IoT part, but instead of forcing farmers to report to extension officers when they detect diseases, the technology will do that minimizing interaction with human beings”, Maginga said.

In addition to having the hope to extend the platform so that it will cover more crops besides maize, Maginga emphasises the importance of applying ChatGPT and other

AI-based solutions in local languages across various sectors

She reckons that Mkulima GPT will be expanded to more African languages.

“For a farmer to interact well with the technology, it has to be in their own local language. They find it more suitable and adaptive,” she noted.

When the final testing processes get done, the platform is expected to be launched in December, but meanwhile, the developers are inviting more experts in agriculture and artificial intelligence to have a look at their work and share insights related to what can be made better, so that when it reaches the small-holder farmers, it will be ready for use.

ACE-DS held its 11th PhD Symposium to assess candidates' research progress



Participants to the 11th research symposium

From 25th to 30th September 2023, the African Centre of Excellence in Data Science held its 11th PhD research symposium in which students presented their research progress to their supervisors and co-supervisors.

The main objective of the symposium for PhD students is to assess their research progress, guide and provide inputs to their research with the support of multidisciplinary panelists from the University of Rwanda, with inputs from regional and International Universities for a smooth completion of the program.

In his welcome remarks, the Acting Principal of the College of Business and Economics (CBE), the host of the Centre Dr. Joseph Nkurunziza commended all participants for

attending and added, "this is the opportunity not only for the Centre to achieve its mandate but also for PhD students to present their research progress and get constructive comments from data science experts".

During the symposium, there was identification of students who are ready for synopsis presentation, those who are ready for comprehensive exam by Doctoral Committee and those who are lagging behind with emphasis on how to speed up their research to be able to complete the program in the normal time frame.

This has also been an opportunity to brainstorm on key achievements of the Centre from its establishment to

date, challenges that were met down the road and plans of how the Centre will sustain after the World Bank funding which is expected to end by December 2023.

The PhD symposium is organized every six months.



Participants

ICT academic staff get tips on internet of things applied in cold chain monitoring system



Trainees during the session

20 ICT Academic staff from University of Rwanda and Rwanda Polytechnic held a five-day training in which they were tipped on internet of things applied in cold chain monitoring system as part of the project being implemented by African Centre of Excellence in Internet of Things in collaboration with Kumva Insight.

The training took place from 1st to 5th September 2023.

The project is dubbed: “A collaborative research study to assess stakeholder needs and mitigate risk in the development of Internet of Things Remote Monitoring Solutions for high-risk cold chains, aiding the storage and delivery of temperature-sensitive vaccines in Rwanda”, and is funded by the National Council for Science and Technology (NCST).

This project aims at designing an IoT remote monitoring system device for cold chain storage of vaccines so that the data can be accessible remotely. This project will contribute to the management of the vaccine storage environment in different the health Center .

During the training, participants were practically taken through current IoT trends in cold chain monitoring system and got hands on current technologies in IoT very useful in research. This has also been an opportunity to explore unexploited research opportunities in cold chain management and monitoring with a case of Rwanda Biomedical Centre (RBC).

“As academicians, we need your expertise in research as we still have so many areas to research on”, said

Sibomana Hassan from RBC as he takes participants through the vaccination process in Rwanda.

“This has been an opportunity to understand and get current status in the Cold Chain monitoring research field for academic staff to brainstorm about them and think for further research”, noted Desire Ngabo, Project Principal Investigator.

Participants have described this training as informative and timely but requested to keep on organizing such trainings to be more updated on new technologies which are emerging in ICT - related fields.

Funded under the program of academia-industry collaboration research grant of the National Council of Science and Technology (NCST), the overall objectives of the project are to prove the feasibility and impact of the IoT RMS product in Rwanda combining market and to gather the data needed to find problematic areas and prove the critical need for a stable cold chain in the medical industry.



Trainees and trainers pose for a photo

www.aceiot.ur.ac.rw

ACEITLMS publishes two hundred eighty-one (281) research papers

For the implementation of its mission of strengthening human capacity to deliver research-based quality teaching and learning of mathematics and science, ACEITLMS students and associate members published two hundred ninety-nine (299) research papers in different international journals, since its establishment, and among them one hundred sixty-one (161) are in journal indexed by Scopus.

During the period of six months (January to June 2023) of this year, 25 papers were published and 20 of them were published in journals indexed by Scopus. The following is the list of papers that were published in journals indexed by Scopus during the period of six months of this year (January to June 2023).

1. Kanyesigye, S. T., Uwamahoro, J., & Kemeza, I. (2023). The Impact of Problem-Based Learning on Students' Achievement in Mechanical Waves in Secondary Schools. *Research in Science Education*, 53(3), 1-21. <https://link.springer.com/article/10.1007/s11165-023-10119-4>
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3. Wakhata, R., Mutarutinya, V., & Balimuttajjo, S. (2023). Exploring the impact of Stein et al.'s levels of cognitive demand in supporting students' mathematics heuristic problem-solving abilities. *Frontiers in Education* 8, 949988. <https://www.frontiersin.org/articles/10.3389/fed-uc.2023.949988/full>
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6. Mbwire, B., Ntivuguruzwa, C., & Mashood, K. K. (2023). Development and Validation of a Concept Inventory for Interpreting Kinematics Graphs in the Tanzanian Context. *European Journal of Educational Research*, 12(2), 673-693. <https://doi.org/10.12973/eu-jer.12.2.6737>. Nicol, C. B., Sentongo, J., Ga
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8. Wakhata, R., Mutarutinya, V., & Balimuttajjo, S. (2023). Dataset on the relationship between students' attitude towards, and performance in mathematics word problems, mediated by active learning heuristic problem-solving approach. *Data in Brief*, 48, 109055. <https://doi.org/10.1016/j.dib.2023.109055>
9. Mbwire, B., Ntivuguruzwa, C., & Mashood, K. K. (2023). Exploring the Understanding of Concept Inventories for Classroom Assessment by Physics Tutors and Pre-Service Teachers in Tanzania. *African Journal of Research in Mathematics, Science and Technology Education*, 27(1), 36-46. <https://www.tandfonline.com/doi/abs/10.1080/18117295.2023.2183607>

10. Munyemana, J. J., Nsanganwimana, F., & Gaparayi, G. (2023). Trends in Use of the Computer Assisted Instruction in Biological Sciences Education: A Systematic Literature. *International Journal of Information and Education Technology*, 13(3). <http://www.ijiet.org/show-186-2432-1.html>
11. Nyirahabimana, P., Minani, E., Nduwingoma, M., & Kemeza, I. (2023). Students' Perceptions of Multimedia Usage in Teaching and Learning Quantum Physics-Post-assessment. *Journal of Baltic Science Education*, 22(1), 37-56. <http://www.scientiasocialis.lt/jbse/?q=node/1256>
12. Mapulanga, T., Ameyaw, Y., Nshogoza, G., & Sinyangwe, E. (2023). Improving Secondary School Biology Teachers' Topic-Specific Pedagogical Content Knowledge: Evidence from Lesson Studies. *Journal of Baltic Science Education*, 22(1), 20-36. <http://www.scientiasocialis.lt/jbse/?q=node/1255>
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Our respective programs

African Centre of Excellence in Data Science (ACEDS) based at UR-College of Business and Economics, Gikondo



We have Day and evening Programs:

- Master/PhD of Science in Data Science in Data Mining
- Master/PhD of Science in Data Science in Econometrics
- Master/PhD of Science in Data Science in Biostatistics
- Master/PhD of Science in Data Science in Demography
- Master/PhD of Science in Data Science in Actuarial Sciences

N.B: All PhD programs are by research.



In partnership with Data Science Council of America (DASCA), we also offer certified professional Short courses:

- Associate Big Data Engineer (ABDE)
- Senior Big Data Engineer (SBDE)
- Associate Big Data Analyst (ABDA)
- Senior Big Data Analyst (SBDA)
- Senior Big Data Analyst (SBDA)

More details: www.aceds.ur.ac.rw

African Centre of Excellence for Innovative Teaching and Learning Mathematics and Sciences (ACEITLMS) based at UR-College of Education, Rukara



We have Day and Weekend Programs:

- Master of Education in Biology Education
- Master of Education in Chemistry Education
- Master of Education in Physics Education
- Master of Education in Mathematics Education
- PhD in Biology Education
- PhD in Chemistry Education
- PhD in Physics Education
- PhD in Mathematics Education

N.B: All PhD programs are by research.

More details: www.aceitlms.ur.ac.rw

African Centre of Excellence in Internet of Things (ACEIoT) based at UR-College of Science and Technology, Nyarugenge



We have the following Programs:

- Master/PhD in Embedded Computing Systems (ECS)
- Master/PhD in Wireless Sensor Networking (WSC)

N.B: All PhD programs are by research.

Short courses:

- a. Rapid Prototyping
- b. Blockchain Fundamentals and Applications
- c. Drone fundamentals and applications
- d. LoRA technologies
- e. IEEE GRSS Drone Sensor Deployment

More Details: www.aceiot.ur.ac.rw

African Centre of Excellence in Energy for Sustainable Development (ACEESD) based at UR-College of Science and Technology, Nyarugenge



We have the following Programs:

- Master/PhD of Science in Energy Economics
- Master/PhD of Science in Renewable Energy
- Master/PhD of Science in Electrical Power Systems

N.B: All PhD programs are by research.

Short courses:

Power Engineering, Smartgrid, Microgrid

More Details: www.aceesd.ur.ac.rw

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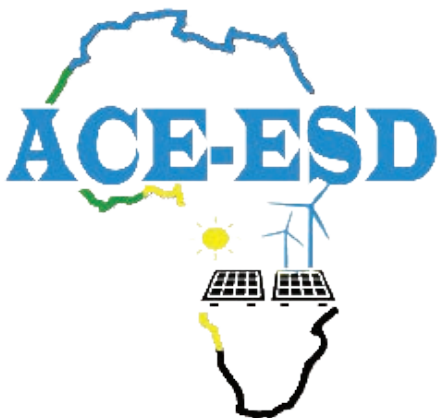
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