African Centres of Excellence

ACEDS train professionals in Machine Learning and Computational Statistics

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The guest of honor, UR officials took a group photo with the winners

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The innovation week brought together energy innovation experts and stakeholders from Rwanda and the wider East Africa region to gather, analyze, and exchange insights on how institutional and research partnerships on climate-smart energy innovations could accelerate the actualization of Rwanda and EAC 's energy policy goals.

While officiating the event the outgoing Minister of Infrastructure Amb. Claver Gatete lauded efforts of the students who exhibited their innovative projects that are providing solutions to sustaining more clean energy for the country.

"We need new innovations and products that serve Rwandan com munities, and projects that are likely going to be cost effective for their users, reducing biomass while scaling up communities especially in rural areas," he said.

"With stable clean energy we can be able to power our industries, homes and also use it in research", he added.

During the closing of the week, 5 promising innovative projects were rewarded. The grand prize of Rwf10 million was scooped by Gorilla Cooking Stove, a cooking stove that produces a blue flame from recycled waste and helps reduce the emission of harmful gases that are discharged into the air.

Noella Umuhoza, Product Manager of Gorilla Cooking Stove, expressed her joy upon winning the award, saying it is a starting point in the journey of working for her country. "I started my project targeting low-income households

who cannot afford cooking gas, and end up using materials to cook that are harmful to the environment and their health,"With this prize I hope to take my project further and impact more communities, especially in rural areas so they can be able to use safe, clean energy while cooking and at an affordable price," she said.

Alexandre Lyambabaje, the University of Rwanda's Vice Chancellor said: "We have incubated them, mentored them, and from here they are ready to take their products to the next level where they will be able to help and change more communities."

"We will do more so we can connect them with more investors, so their projects can be stronger and not fail", he added.

The Grid Innovation and Incubation Hub (GIIH) is one of four incubation hubs in the region funded by the World Bank.

IoT professionals to be trained in ICT Human Resources Initiative for Business Development
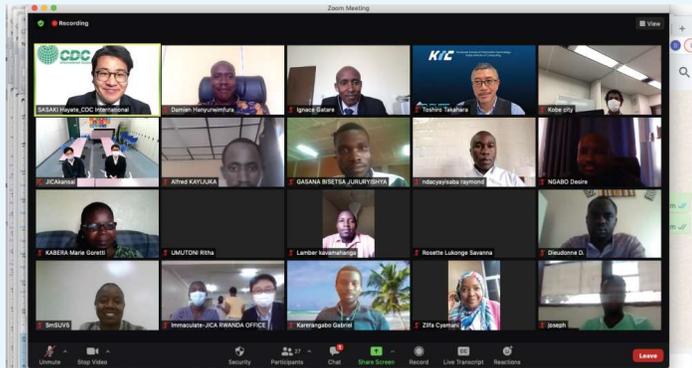
The introduction meeting took place virtually

At least 20 students in ACEIoT and professionals in IoT are supposed to undertake a six-month training to sharpen their capabilities in ICT Human resources initiatives for Business Development.

This training is organized under the signed cooperation between the University of Rwanda and JICA on Japanese Technical Cooperation. The training has the main objective of fostering ICT human resources with the aim of becoming a bridge between Japan and Rwanda's business society.

This training will feature internet of things and Entrepreneurship courses to enhance the employability of youth in Rwanda to boost the new employment in Rwanda's ICT Sector.

Participants to the training are professionals with IoT skills mainly ACEIoT master's students and other candidates from Industry with background in ICT—related disciplines and other related fields with IoT experience.

This first training phase kicked off on 15th February 2021 and will be taking place 2 days per a week for a period of six months.

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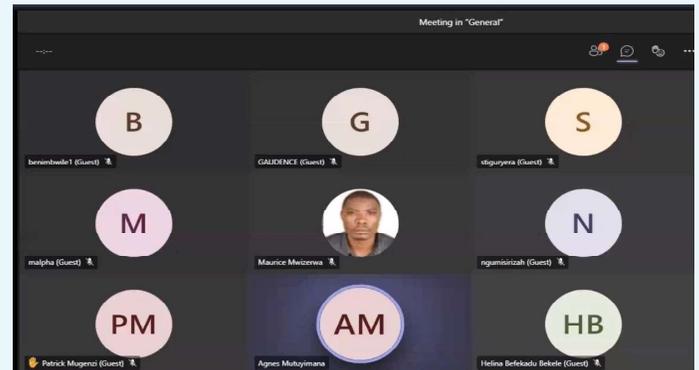
The training took place virtually due to Covid -19 measures

From 1st to 11th February 2022, the African Centre of Excellence in Data Science (ACEDS) held a virtual short course in machine leaning and computational statistics to professionals with strong quantitative research background.

This course had the main objective to enhance the capacity of professionals with strong quantitative research backgrounds to provide cut aged analytical techniques for scientific evidence to support (or refute) the efficacy and scalability of policies and programs within Rwanda and Africa in general.

During the two-week course, which was facilitated by Dr. Emmanuel Dufourq from the African Institute for Mathematics Sciences, South Africa, covered a variety of topics in machine learning, ranging from optimization and Bayesian inference to deep learning, reinforcement learning, introduction to Python and Gaussian processes among other concepts.

The course used real data as motivating examples for each topic to allow students to easily digest the concepts in a friendly manner.

Participants to the training were given a broad overview of many relevant topics in machine learning and to help training the next generation of machine learning researchers. This course was designed for Researchers/Postgraduate students/other professionals with strong knowledge in quantitative methods.

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ACEIoT acquires the awaited IoT Lab equipment



A team from ACEIoT proudly received the equipment

The African Centre of Excellence in Excellence in Internet of Things (ACEIoT) has acquired the IoT lab equipment as part of phase one as per the signed collaboration agreement between UR and RIT for IoT lab establishment. The equipment will be useful, not only to the Centre but also to professionals in IoT in the region.

The unique IoT Lab in the region is expected to benefit Master, PhD students and IoT industry in practical experiments and serve as a training facility for professionals in IoT from the region who want to enrich their career in the internet of things and other emerging technologies.

'We are thankful to the partnership with RIT. This lab will enable us to provide practical skills in IoT and other emerging technologies and ultimately boosts the quality of education that the Centre provides", said Assoc.-Prof. Damien Hanyurwimfura, Centre Diector.After the installation of the equipment, experts from RIT will provide training to local staff on the function and management of the lab.

The other round of equipment is expected to arrive in March 2022.

ACEITLMS evaluates Research Proposals for MEd Cohort one, weekend program
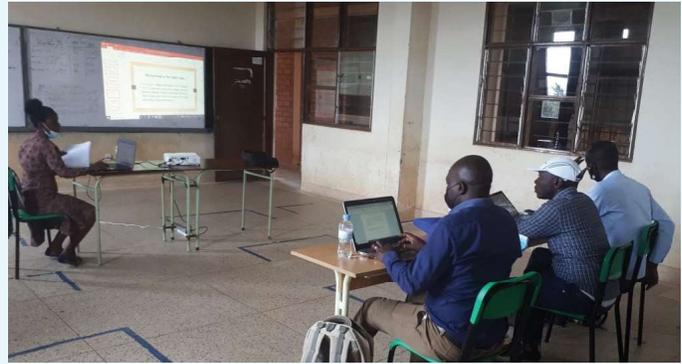
The weekend program is taught in Kigali

Research Proposals for 22 MEd students making the first cohort of MEd, weekend program, were evaluated in order to guide and provide comments on students' research proposals before starting the actual research.

As of University of Rwanda rules and regulations, in order to meet the ACEITLMS requirements and mission to achieve research excellence, Masters Research proposals are subjected to internal evaluation that has to be carried out by academic staff and researchers at the University of Rwanda.

During the evaluation, Oral defense (Viva Voce) was conducted for the research proposals and students were given suggestions and comments to improve their research proposals based on the evaluation reports.

The African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) has introduced the weekend program in order to facilitate professionals in science education to pursue their studies while on their jobs.

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In order to implement and achieve its mission of Strengthening human capacity to deliver research-based quality teaching and learning of mathematics and science, ACEITLMS organizes seminars for its students and associate members on different topics. in January and February 2022, the following topics were discussed in these seminars:

Topic: The Impact of Problem-Based Learning on Students' Achievement in Mechanical Waves Among Secondary Schools in Southwestern Uganda.
Speaker: Stella Teddy Kanyesigye,
Ph.D. student of Physics Education

Summary: The role of Science, Technology, Engineering, and Mathematics (STEM) in general and Physics, in particular, is very vital for the economic development of any society, especially in developing countries. For instance, the knowledge of Physics – one of the STEM subjects, is the engine behind telecommunications, energy, architecture, engineering, electricity production and transmission, construction, and transport.

Previous researchers found out that students at all levels of education tend to have difficulty understanding fundamental ideas and concepts of waves. In response, the physics curriculum has undergone various global and local reviews to ensure that it is responsive to the needs of the learners by providing competency-based learning through active learning methods including Problem-Based learning (PBL) (Nsengimana et al., 2020; REB, 2015).

However, students' achievement in physics generally and particularly in wave concepts has persistently remained poor. This may lead to a negative attitude, perception, and interest towards the general subject of physics, resulting in a general reduction in enrollment of students in STEM courses, hence a lack of future skilled labor. s that are competitive for the world economy (Nsengimana et al., 2020). In chemistry
education, more engaging methods are also emphasized. This is because chemistry is the most popular subject due to its advantage of preparing students to pursue a career applied in many fields of life.
Despite the worldwide known application of chemistry, studies have revealed the learning difficulties of some basic chemistry concepts at the school level. It is with these inspirations that the study aimed at investigating the effect of TBL on students' achievement in chemistry, especially in chemical reactions among selected Rwandan lower secondary schools.
The findings of this study confirm that the Task-Based Learning method, an active learning method, has the most significant effect on students' understanding of chemical reactions.

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Topic: Enhancing Students' Achievement in Biology Using Inquiry-Based Learning in Rwanda
Speaker: Henriette Manishimwe,
Ph.D. Student (Biology Education, Cohort II)
Summary: Biology is a core subject in the Rwandan education system in ordinary and upper secondary schools. Biology contributes to knowledge acquisition and scientific skills that can help to understand life processes and interactions between humans and the environment. Despite the importance of biology, the level of students' achievement in biology at secondary school in developing countries remains low.
Research revealed that inadequate teaching methods, coupled with students' attitude, nature of topics, students' learning and studying habits, and lack of teaching resources are among the factors that cause poor achievements. In Rwanda, the problem of poor performance has been identified in recent studies. This has a negative impact on students' achievement due to the lack of desired knowledge, skills, values, and attitudes. In relation to teaching, science education principles consider active participation of students in teaching and learning processes instead of passive education where the teacher is taking the main role.

Topic: Effect of Task-Based Learning on Students' Understanding of Chemical Reactions' Among Selected Rwandan Lower Secondary School Students
Speaker: Jeannette Musengimana,
Ph.D. Student (Chemistry Education, Cohort II)

Summary: Active learning instructions that are learner-centered are the main practice for any country implementing a competency-based curriculum (CBC). When properly used, active learning instructions prepare citizens that are competitive for the world economy (Nsengimana et al., 2020). In chemistry education, more engaging methods are also emphasized. This is because chemistry is the most popular subject due to its advantage of preparing students to pursue a career applied in many fields of life.
Despite the worldwide known application of chemistry, studies have revealed the learning difficulties of some basic chemistry concepts at the school level. It is with these inspirations that the study aimed at investigating the effect of TBL on students' achievement in chemistry, especially in chemical reactions among selected Rwandan lower secondary schools.
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ACEIoT DC meets for Comprehensive Examination for Doctoral Candidature for the 3rd cohort of PhD students

DC meeting was held physically respecting social distancing guidelines

The second DC meeting known as Comprehensive Examination for Doctoral candidature where every PhD student appears to DC for the comprehensive oral examination for doctoral candidature and present his/her extensive research proposal and research progress. This examination tests the fitness of the candidate to proceed further with the PhD work.

"If the performance of the candidate in the comprehensive examination is satisfactory, his/her registration shall be confirmed with Doctoral Candidature. If the performance is unsatisfactory, he/she shall be given one more opportunity to appear for the examination within six months of the first examination", reads part of UR programme structure of Doctor of philosophy degree by research.. Most these candidates are under RSIF scholarship.

On 23rd February 2022, a Doctoral Committee (DC) meeting was held at African Centre of Excellence in Internet of Things for comprehensive Examination for Doctoral Candidature for PhD Students. This is in line with UR General program structure of Doctoral of Philosophy degree by research.

The main objective of the DC meeting was to monitor the third cohort PhD students' progress. The Doctoral Committee meets three times during a student's PhD study period. The first DC meeting focuses on the PhD Research Proposal Presentation where every student is required to present his/her revised PhD research proposal for further guidance and suggestions to improve the proposal.

At ACEIoT, a doctoral committee is comprised of 5 members.

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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:

    a. Associate Big Data Engineer (ABDE)
    b. Senior Big Data Engineer (SBDE)
    c. Associate Big Data Analyst (ABDA)
    d. Senior Big Data Analyst (SBDA)
    e. 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 of Science in Embedded Computing Systems (ECS)
- Master/PhD of Science in Wireless Sensor Network (WSN)

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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