



Students of International University of East Africa with Dr. Emeka (centre) during a robot construction

Uganda waking up to robotics in classrooms

By Conan Businge

A 23-year-old Rwandan student, Henry Mukamutara, takes his time, as he goes through the wiring and making comparisons with his research on the computer. The robot he is assembling is expected to follow commands, which have to be coded in an electronic system.

He is working with several other students on the project. For this, they are crafting a robot, which can dive and execute given tasks. There is also another set of robots which can fly.

Mukamutara is a student at the International University of East Africa (IUEA). He is one of the hundreds of students in the country, who are now embracing the learning of robotics, through science and technology training and competitions in primary, secondary and now universities.

Robotics is a branch of computer science, mechanical engineering and the electrical

engineering that deals with the construction, design, operation and application of robots as well as the computer systems for their control, sensory feedback and information processing.

After close to a decade of robotics in Uganda, 90% of all competitions and tournaments are still linked to First LEGO Robotics, an international robotics training centre.

In fact, the rise of robotics teaching in Uganda can also be attributed to First LEGO league and the organisers behind it.

Recently, schools from various parts of the continent, convened in Kampala to take part on the science and technology competitions and robotics was one of the major components of the competition.

Dr Emeka Akaezuwa, the dean at the Faculty of Science and Technology, of

International University of East Africa, says: "Initially, schools and higher institutions were not viewing robotics as a necessity. It was rather a 'nice to have' for schools or institutions that could afford it."

IUEA runs two of the only degree courses in robotics in the country.

In the past, there were no formal trainings, competitions or exhibitions concerning robotics at all.

Now, institutions ranging from local secondary schools to universities around the country are integrating programmes, such as robotics and artificial intelligence into their curriculum.

Emeka says universities at times shy away from investing in robotics because they think it is expensive.

"Teaching about robotics is easy. All it requires is the use of recyclable material, which is locally available," Emeka explains.

The other contribution to the learning of robotics in the

country has been through the FundiBots.

This year, pupils from 10 schools in Kampala were able to create various exciting and innovative robotics projects in the fields of programming, mechanics and electronics.

The camps aimed at equipping juniors aged between nine and 12 years with skills that can enable them solve world challenges through digital design.

While the camp was intended to be introductory, covering the basics of robotics under three aspects — electronics, programming and mechanics, participating students were able to develop functional projects despite the limited time available.

"What surprised me most is that even though we had limited time, pupils were able to create more than we taught," FundiBots' Solomon Benge, who was also the camp's main facilitator, said.

WHY CARE ABOUT ROBOTICS?

Ronald Namugera, the registrar of the Engineers Registration Board, says: "Teaching about robotics is the way to go. Other countries have already embraced the trend and we do not live on an island in the global village, not to follow suit, in technological advancements."

"Probably, those who are teaching robotics should look at areas of study, such as agriculture, which needs modernisation. If robotics, for instance, can improve the irrigation process, why not embrace the move? he argues.

With the changing times of advancement in technology and production, education experts say having robotics in the education system is the way to go. The former National Council for Higher Education executive director, Prof. Abdu Kasozi says as the times change, there is a growing need for universities to come up with new ideas and concepts. Robotics could be one of them.

"We need students who can think outside the box and this is the right move," Kasozi says.

He says in the past, teaching robotics was not a priority, which explains why most universities never used to consider it.

While the physical components may not command high prices, the skills students gain in the process could prove lucrative. According to euRobotics AISBL, the global market for robotics amounted to \$25.8b in June 2014 and is expected to grow to more than \$70b by 2020. The delay in teaching of robotics in Uganda, education experts say, is linked to the old time preference of arts and culture, above engineering and technology.

"The Government now appreciates the teaching of science and technology and we are embracing so many changes in the education sector," Dr John Musingo, the state minister for higher education says.

Musingo says the teaching of robotics is a right move for the country's higher education. Our students need to think fast for our growing industries and communities, and we should embrace this move." John Agaba, the former commissioner for government-aided secondary schools, says primary and secondary schools, alongside universities need to embrace the advancement in science and technology training.

"Universities should help our country invent the right technologies.

Dr Yusuf Nsubuga and the former director of basic and secondary education, now education consultant, says: "Unless we harness the students' ability to think and invent, we will not be helping our country. Robotics is a great move for our country's education."

He says in the past, this area was not invested in, because of the high costs involved. "But if there are private investors going in this direction, we should just support them."

Dr Nsubuga adds: "Robotics will help students become job creators, other than settling for job hunting. This kind of teaching will prepare for the country the right brains for industrial growth."

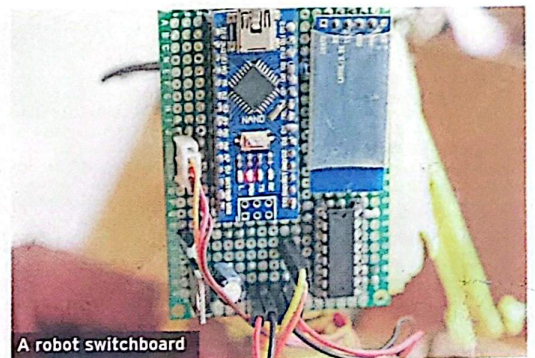
"Wherever robots are used, the students are creative and helpful to their countries," he adds.

Dr Ayorkor Korsah, a Ghanaian with a PhD in robotics and artificial intelligence from Carnegie Mellon University, in a statement, says: "To be an engineer is to be a creator, and it impacts on many people when you are the creator of the technology that powers our lives."

Dr Korsah, who is also a co-founder of the African Robotics Network, says each and every one of us has to play an active role in encouraging the young people around us to go into engineering and to consider it as a profession.



Some of the robots that have been worked on



A robot switchboard