Ilabs@Mak Project concludes search for best innovators

Dr Obote College Boroboro has edged 7 other schools to win this year's Science and Technology Innovations Challenge, hosted by iLabs@Mak Project, one of the research projects at the College of Engineering, Design, Art and Technology.

POSITION	SCHOOL	PROJECT/ ROBOT	OVERALL MARKS
1st	Dr Obote College Boroboro, Lira	Pitch demarcate	183
2nd	Mary Hill High School Mbarara	Self-Monitored car	177
3rd	Lira Town College	Automated pesticide sprayer	172
4th	Makerere College school	The Nemar C7H	169.5
5th	St. Mary's College Kisubi	Hydra 256	169.2
6th	Ntare School, Mbarara	The Heggai Project	167.8
7th	Kings College Buddo	Seed planter	162.8
8th	Mt. St. Mary's Namagunga	The Votatron 3000	143.5

The colourful ceremony, held on Saturday 12th October 2013 was presided over by the Minister of Education and Sports, Hon. Jessica Alupo and saw Dr Obote College Boroboro winning the grand science and Technology Innovations Challenge beating seven other school that earlier qualified for the final completion. This year's Science and Technology Innovations Challenge, organised by the iLabs@Mak project saw 18 schools taking part. The regional competitions were won by Ntare School and Mary Hill (Western Region); Lira Town College and Dr Obote College Boroboro (Northern region); Makerere College School, Mt. St. Mary's College Namagunga, St. Mary's College Kisubi and Kings College Budo (Central Region).

The competition involves building robots that address society problems, disassembling and assembling of mobile phones and a question and answer session, testing their understanding of the world of science.

The winning school built a robot that demarcates pitches. The robot is programmed to demarcate a football march, a cricket march, and a basketball pitch etc. Name it and the robot will do a perfect job.

Dr Obote College Boroboro, Lira walked away with 20 computers for the school's e-learning and 8 smart phones all courtesy of Huawei, the biggest sponsors and supporters of the science and technology innovations challenge. This year, the iLabs@Mak project also got support from Airtel Uganda who gave way 3 smart phones to the best presenters from the 3 regions.

The First, second and third runners-up also walked away with smart phones from Huawei Technologies Uganda.

The guest of honour, Hon. Jessica Alupo, who was visibly impressed by the student presentations, pledged government's continued support to science and technology. She called on more secondary schools to engage in the Science and Technology Innovations challenge.

"As the Minister of Education and Sports, I am proud of Makerere University, the fact that I am a humble alumnus, notwithstanding. This University, the oldest in the country has of recent lived up to expectations, with the rise in its ranking underlying the research and innovations being churned out. I pledge that Government, through my Ministry, will continue to support the University in all possible ways to ensure that the great work is sustained, because as Government, the success of the University is indeed our success," Hon. Alupo said.

The Principal Investigator of the iLabs@Mak Project, Prof. Tickodri Togboa said the project will this year extend to more schools including the eastern region.

"Ever since we started, we have been pleasantly surprised by the level of innovation buried in these prodigies. Some of the ideas displayed at this level, rudimentary as they seem, are the envy of some of our fourth year students in engineering school," he said.

Prof. Tickodri's research projects have not stopped at just training these students in robotics. They have gone ahead to give internship placements to the best students. Last year's winning team from St. Mary's College Kisubi, has since the beginning of this year been working with the Centre for Research in Transportation Technologies."I must hasten to admit that our continued interaction with the young minds has further strengthened our resolve to work harder, and provide more auspicious platforms in which our young ones can showcase their brilliance."

"We are in the ultimate stages of realizing the KIIRA EV SMACK, a hybrid vehicle that incorporates concepts from the team's innovation that was exhibited in a similar platform last year," the Professor said.

"Our pioneer students in this competition, now sophomores in Engineering School, are miles ahead of their colleagues in applying science in practice. We have to lionize this effort so as to continually bridle the inhibitors to our young innovators."

The Vice Chancellor, who was represented by the University Secretary, Mr David Kahundha Muhwezi, thanked CEDAT students on the ilabs@Mak project for training the secondary students and by so doing nurturing the young scientists.

"Through these projects Makerere University has demonstrated her relevance to society through science and technology innovations," he said.

The CEDAT Acting Principal, Dr Henry Alinaitwe, was represented by the Dean, School of the Built Environment, Dr. Moses Musinguzi. Dr Musinguzi also thanked the ilabs developers for a job well done in nurturing the young generation.

In 2010, the iLabs@MAK Project, supported under the Presidential Innovations Fund to Makerere University, undertook to promote science and technology incubation through institution of a project-based learning model in Ugandan secondary schools. This community outreach initiative is geared towards unearthing and supporting Uganda's young innovators before they join University.

The outreach program presently covers 18 schools from all regions of the country. Students have been facilitated to form Engineering Design Clubs, equipped with hardware and software and trained to design and prototype meaningful robotics and electronics applications. The robotics applications are based on the LEGO NXT and EZ robot platforms. These prototypes are showcased at the Science and Technology Innovations Challenge, an annual event held first at Regional level, and then at National level.

THE PROJECTS

- **Dr. Obote College Boroboro**
- *The hybrid pitch demarcator*, a robot that utilizes multiple energy sources, used to automatically demarcate pitches (such as cricket, basketball, football pitches), roads and parking yards. It is run with a custom program that has the relevant topographical and other information pertinent to the area to be demarcated. The robot moves, drawing the relevant straight lines (full and dotted), and curves until the job is completed.
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- **May Hill High School***A "SELF-MONITORED CAR"* which consists of; an automatic seat belt, an overload controller, a trouble informer, a driving light controller and an over-speeding informer. The trouble informer enables the owner to be informed of any intruder in their car, thus allowing them to react accordingly. The automatic seat belt acts as a reminder to those drivers who are lazy or just forgetful. It does this by rolling itself down, five seconds after the person has sat. This helps the driver to remember to fasten their seat belts before setting off for any journey.

  The over-speeding informer makes the owner aware of the speed at which their vehicle is moving. This is helpful to inform the owner just in instances where the speed of the vehicle is beyond the permissible value, as might be the case for hired vehicles, company vehicles and taxis.

  It also has a driving light controller whose purpose is to reduce on light intensity incident on the driver in case it is high, allowing the driver to concentrate fully on the steering wheel.

  It also has an overload informer, which makes sure that the vehicle only moves if the weight loaded is not beyond a pre-determined limit.

  Lira Town College

  The automated pesticide sprayer is a robot that automatically sprays pesticide on a commercial farm without any human intervention, other than loading the pesticide. It can rotate through 360 degrees, alternates between different rows, and retreats to the farmhouse when the pesticide is finished.

  Makerere College School

The NEMAR c7H, an automatic truck that automatically collects filled garbage bins in urban areas, replacing them with empty ones. It is programmed to park by the road-side and with the help of the ultra-sonic sensor, avoids collision with any obstacles both human and non-human. Its light sensor detects the colored bins, initiating a chain reaction which automatically reduces the speed of the truck so as to park properly. The crane arm is initiated by the EZ robot board rotating it in position above the bin. An electro-magnet is lowered, attracting the bin which has a metallic top, raises the bin and rotates into the cabin part of the truck. The bin is dropped on a conveyor plate. The plate rotates in such a way that the dirty bin is replaced with a clean one, and the process is continuous.

St. Mary's College Kisubi

The Hydra 256, artificially intelligent water purification, pumping and storage system for controlling floods and availing water in times of scarcity for remote areas. It utilizes a combination of solar and wind energy, both of which are green energies, excess of which can be used by the community. It consists of multiple subterranean tanks that collect excess water in an area, preventing flooding. The water is purified by decantation and automatic dispensing of a purifying solvent once a certain level is attained. The system automatically pumps the water for use when required.

Ntare School

The Heggai, an automated stove incorporating kitchen ware. The system comprises of a removable saucepan, a scooping spoon, a stirrer and a heat source. The parts are connected to motors (the driving system) and sensors (ultrasonic and touch). The removable saucepan holds the content being prepared, the scooping spoon is used to test what is being prepared safely and the stirrer is used to mix the contents in the saucepan. The system saves time and reduces burns and scalds; these being the commonest form of injuries experienced in most kitchens around Uganda. The aspect of automation is a plus in its own way, since one can only wait for results after setting the system to operate. Thus, the robot makes cooking of large sums of food easy.

King's College Budo:

The seed planter is an automated robot applicable as an agro-mechanical device for planting seeds. It digs a hole with an inherent shovel, drops the seed into the ground from the seed bin, and as the machine moves on, the blade underneath covers the seed with soil. It can maneuver around obstacles and alternates rows at the end of the field, thus cutting down on labor costs, saving time and improving efficiency, especially on large scale farms.

Mt. St. Mary's College Namagunga

The Votatron, a system that aims at improving the efficiency of the voting system in Uganda, eliminating impediments such as multiple voting, high costs of voting materials and tedious counting of votes, whilist providing the ultimate voting experience. It consists of an ultrasonic sensor placed at the door of the "voting room", that is able to detect motion of the voter. It has

motors connected to pulleys fitted in the wall that lever up the door once the voter is less than 20cm from the door and lever it down after a programmed time, say, 5 seconds.

Each registered candidate is given a color, say, blue, red, etc. and each registered citizen is able to pick one card basing on the candidate of his choice. Once the door is closed, the controller is activated and the voter can place their card onto the color sensor, which in turn detects and identifies the color, thus allowing the controller to record the entry. Consequently, the door opens and the voter can leave. After each successive voting session, the controller tallies the votes, and hence automatically dispenses results.

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For more pictures of the iLabs Technology Challenge Final, please visit our gallery

Story by NTV: https://www.youtube.com/watch?v=Y-WMkIouXcc

Story by the Daily Monitor: http://www.monitor.co.ug/Magazines/Jobs-Career/Uganda-s-new-inventors/-/689848/2037032/-/fsaalsz/-/index.html