



Water KIDZ

Northern Cape pupils scoop first prize in water network competition



A team from the Northern Cape town of Kimberley scooped first prize in this year's Aqualibrium-competition, hosted by the Southern African Institution of Civil Engineering (SAICE).

CF le Roux, member of the SAICE Kimberley Branch and Malcolm Pautz, 2015 SAICE president, with Aqualibrium winners Lourens van Niekerk, Frans Jacobs, Lohann Burger (Hoërskool Diamantveld) and Gaillard Rossouw, Business Unit Lead, Civil Infrastructure at AECOM.

Water distribution systems are important to supply safe and clean drinking water to communities. In order to educate learners about the importance of water networks and expose them to the day-to-day challenges faced by water engineers in ensuring equal access to water by all, SAICE, introduced the annual Aqualibrium competition in 2003, in its hundredth year of existence.

The aim of the competition is to distribute three litres of water equally between three reservoirs (containers) placed randomly on a grid of 16 points. Participants build a pipe network between a water source and the three reservoirs using plastic pipes of different diameters. Teams are judged on how well they can achieve this task within a set period of time. To determine the winner the volume of water in each reservoir is measured and penalty points are calculated (teams are penalised for supplying less than or more than a litre per container).

The competition exposes learners to the practical application of processes that influence their daily lives, which is how water gets to their homes. They are made aware of the intricacies involved in the design of water distribution networks and the actual water delivery to households.

The grid used for the water distribution network is on a background that depicts the entire water cycle. This grid



The team from Winnie Mandela Secondary School, in Tembisa, hard at work building their water network.

intrigues learners, as well as educators, who find it a helpful educational tool. The competition creates awareness regarding the issues surrounding water in South Africa. It spreads the message that water is a precious commodity that should be recycled, reused, and respected, while the use of water should be reduced.

The group with the lowest number of penalty points wins the competition. Competition rules test the creativity of the teams,

for example, the main supply pipe has to be connected at point 1 on the competition sheet; pipes must align with the grid on the sheet, and where two or more pipes meet at a junction they must all be connected to each other. A maximum of eight lines on the sheet grid may be left without a pipe.

SAICE organise regional competitions through their branches across the country, and the regional winners are flown up to the first national finals held at the Pretoria Show. Following the success of the first event, the Aqualbrium competition has become an annual event on the institution's calendar.

It is interesting to note that all three winners of the 2014 competition are currently studying civil engineering, underpinning the value of continuing with these kinds of projects in order to make a difference to the priority scarce skills situation in South Africa.

This year's competition was co-sponsored by AECOM. Other sponsors included Bosch Stemele, Marley Pipe Systems and DPI Plastics. For the first time, the competition also included regional teams from Swaziland and Zimbabwe.

But it was the team from Hoërskool Diamantveld that turned out victorious, conceding only 45 penalty points. Representing their school was Frans Jacobs, Lourens van Niekerk and Lohann Burger. In the second place was the team from Merrifield College from East London, represented by Kiam Venter, James Gibson and Dominique Plaatjes. The team from Mzilikazi High School in Zimbabwe achieved third place. This team was represented by Anita Dube, Vusumuzi Ngwenya and Freedom Mhondiwa.

A penalty score below 100 is considered excellent. Interestingly the minimum number of penalty points (and therefore the highest score) ever achieved was 30. This has been achieved twice in the national finals – the first time in 2008 by Brackenfell High School from Cape Town and the second time in 2012 by Port Rex Technical High School from East London.

Learners experience the competition as great fun and a valuable learning activity. A simple and fun activity, it doesn't matter what your age or level of learning. However, while the competition is simple to understand and fun to do, the underlying problem is highly complex: the three small reservoirs can be placed in more than 3 000 combinations, and potentially there are 280 billion possible pipe networks for each one of these combinations.

An important factor of the competition is the fact that it attracts entries from both privileged and under-privileged schools. Everybody stands a chance at winning and, through the years, about one third of national competitions over the years have been won by very underprivileged schools. The competition has also seen an increasing number of entries by mixed and all-girl teams – an indication perhaps that engineering is no longer seen as an exclusively male career choice.

For two consequence years, the Aqualbrium competition has been selected as a finalist of the National Science and Technology Forum-BHP Billiton Awards in the science communication and science awareness category. According to SAICE, the competition strengthens government's initiatives aimed at encouraging learners to take Mathematics and Science at school and to follow a career in engineering.

The team from Lenyora la Thutho Comprehensive School carefully selecting their network parts.



The competition has seen an increase in mixed girl-boy teams and all-girl teams competing through the years.

New educational tools help kids dig into soil science

A new series of educational materials is teaching children the importance of healthy soils for our food, environment, livelihoods and well-being.

Developed by the Food and Agriculture Organisation of the United Nations (FAO) as part of the 2015 International Year of Soils, the materials target children aged 5 to 14, using word games, puzzles, drawing activities and other interactive elements.

The four educational booklets are separately designed for beginner, intermediate, advanced and young adult students, with an accompanying educator's guide for teachers. Available in English, all of the booklets are available for download on the FAO International Year of Soils website (www.fao.org/soils-2015/resources/educational/en).

FAO is now collaborating with government who wish to translate the materials into additional languages to be used in primary and secondary school curricula. Once finalised, all of the materials will be available online for free use by member countries, teachers and students.

