

# Fostering South Africa's young scientists

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An innovative new programme has been launched in South Africa with the aim of enticing pupils into careers in the scarce-skills fields of science, technology, engineering, mathematics and innovation - the STEMI subjects.



Through the Yesa programme, pupils with an aptitude for science and engineering are nurtured, with a view to adding to the skills supply in scientific disciplines.

The FabKids programme is the brainchild of Dr Ron Beyers.

After teaching a range of subjects including maths, science, biology, computer science and technology education at high-school level for almost 30 years, Beyers is all too aware of the dismally low number of learners who pass these subjects in matric, and the even lower number of university graduates in these fields.

He is passionate about the need for a far stronger focus on the STEMI subjects from as early as primary school level. "Education in South Africa largely ignores the importance of innovation," he says.

Five years ago Beyers was approached by the Council for Scientific and Industrial Research's (CSIR) Meraka Institute to set up a STEMI pipeline specifically in science and engineering.

The time spent at the institute, along with almost a decade of research into early interventions, earned him a PhD from North-West University, with the title Promoting Human Capital Development through ICT's Creativity and Innovation.

The formation of the Young Engineers and Scientists of Africa (Yesa) organisation also arose out of Beyers' work.

## Rapid prototyping key to realisation of ideas

The FabKids programme has emerged as a Yesa key initiative.

The programme makes use of FabLabs (fabrication laboratories) which serve as an exciting, hands-on introduction for pupils to a fascinating new world of innovation through the concept of rapid prototyping.

The FabLab concept was introduced to South Africa in 2005 by the Advanced Manufacturing Technology Strategy Implementation Unit, an instrument of the Department of Science and Technology, in conjunction with the CSIR, where the manufacturing technology unit was hosted.

A FabLab is a small-scale version of a mass production factory which can be used by individuals to create prototypes ranging from arts and crafts to engineering and architecture models.

According to Beyers, the environment created in the FabLab is that of peer-to-peer learning that enables anyone - with or without a technical background - to learn, experiment and, as far as possible, make their imaginings tangible.

This means that pupils can walk into the high-tech FabLab with an idea and walk out with the first prototype in a matter of a few hours.

"Rapid prototyping sees the inventor given tools to turn an idea into reality in a very short space of time - no more sketches on the back of a cigarette box," he says.

Although fabrication laboratories themselves are not new in South Africa, Beyers' FabKids programme is aimed at tapping into and developing potential at a very early stage.

His approach is two-pronged: to create opportunities for youngsters to be exposed to cutting-edge technology in a rapid-prototyping environment, thereby promoting creativity and innovation; and then to identify and track individuals who show particular talent.

To achieve this, as well as maximum exposure of his programme to pupils, Beyers opted to address them on a comfortable level, by using the popular locally-developed social media service of MXit "to make it more affordable to reach kids even on the back seat of a taxi, 24/7".

While the initial version of this outreach was sponsored by the South African-Finland Knowledge Partnership on ICT, more recently Beyers, working with mobile social networking company Every1Mobile, developed a virtual passport for users in the Yesa community to earn so-called stamps to track their progress as they conduct virtual experiments online, answer questions and deliver content.

"It is vital we track and foster talented individuals who have been identified," he says of the online tracking system. And it would seem that word of the programme is indeed well and truly out among pupils in South Africa and further afield in Africa. Within two months of the My Yesa Passport being launched in May, more than 50 000 visitors had been to the MXit site and 5 000 users registered for their virtual passports.

## **Expanding into Africa**

The programme has penetrated into 15 different African countries, with one of the largest user bases, after Johannesburg, located in Harare, in neighbouring Zimbabwe, says Beyers.

He is now lobbying for major organisations "with an interest in developing solutions in Africa" to come on board so as to allow for the development of services and the expansion of the online community.

"Sustainability is vital to the success of this intervention," he says.

While a new generation of FabKids is nurtured in five permanent FabLabs in the country - in Bloemfontein, Kimberley, Potchefstroom, Shoshanguwe and Mokopane - a mobile FabLab is used to take the concept into communities that do not

have access to the permanent units.

The 10m<sup>2</sup> mobile laboratory, which is pulled by a four-ton truck for which Beyers himself obtained a heavy-duty driver's licence, is based in Port Elizabeth until September and is sponsored by the CSIR and the national Department of Science and Technology.

"South Africans are very creative but they also need to have access to the technology to turn their ideas into innovative solutions and potentially take them to the market place," says Beyers. "The mobile lab can play a very significant role in literally taking technology to the users in communities. It is being used in a hands-on approach to promoting innovation and creativity at school level."

The programme will also help to bring about social change and innovation, as it encourages communities at grassroots level to find creative solutions to their everyday problems of life in Africa, he says.

Again he emphasises the need for sustainability. "We need to stop wonderful ideas being lost because of a lack of facilities to take them further."

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