

South Africa's First GeoGebra Conference - @ NMMU



HIGH-TECH TEACHING TOOL: Putting the spotlight on maths software GeoGebra, which is used by millions of teachers and pupils worldwide, are (from left) Prof Werner Olivier, head of Nelson Mandela Metropolitan University's newly established GeoGebra Institute, and Dr Zsolt Lavicza, who chairs the International GeoGebra Institute at Cambridge University, England. Photograph: Nicky Willemse



21st century maths

By Nicky Willemse

Africa's first conference on GeoGebra – the free mathematics software that is stimulating interest and understanding in countless maths classrooms worldwide – kicked off at Nelson Mandela Metropolitan University yesterday (Monday).

About 80 teachers are attending the two-day conference, hosted by the university's newly-established GeoGebra Institute – one of 95 in 65 countries worldwide, and the third to be started in Africa.

The open-source dynamic software, which allows teachers and pupils to visualise and experiment with geometry, algebra, tables, graphing, calculus and statistics, has proved such a hit worldwide – particularly in Europe – that Google is planning to include GeoGebra in its Google Chrome operating system, for even wider access.

Keynote speaker Dr Zsolt Lavicza, an associate lecturer in mathematics education and chair of the International GeoGebra Institute at Cambridge University, England, who is coordinating the development of GeoGebra Institutes worldwide, said the software, first developed in 2001, had been

translated into 58 languages worldwide – and had captured the interest of teachers and pupils to such a degree that some pupils had even written books about their research. “Sixteen-year-old pupils in Rome have written a 350 page book on their GeoGebra research on *mascaroni* (decorative keystones, normally faces, in architecture).”

Prof Werner Olivier, who chairs NMMU’s GeoGebra Institute, said: “The huge challenges in mathematics education and the extent to which the use of technology is absent in South African schools is well-known... This conference seeks to promote the effective use of Information and Communication Technology (ICT) in maths classrooms by exposing local educators to some of the successful teaching strategies abroad.”

It is hoped the introduction of GeoGebra in South African maths classrooms – and its planned expansion into the rest of Africa – will lead to improved matric pass rates, enabling more pupils to enter maths-dependent studies at tertiary level, such as engineering.

GeoGebra is open-source, which means that the original software developed by Markus Hohenwarter – who came up with the concept for his masters studies in mathematics education and computer science at the University of Salzburg, Austria – can be further developed by the teachers who use it.

They are encouraged to share and upload GeoGebra material they have successfully used in their classrooms onto the GeoGebra website. “There are 25,000 such online learning objects uploaded onto GeoGebra Wiki – and we have six million downloads a year in 190 countries. GeoGebra has also been introduced into maths textbooks in 30 countries,” said Lavicza.

Countries such as Spain, Brazil and Argentina are installing GeoGebra in millions of e-books for use by school pupils.

The technology has won a string of European and United States awards, including the European Academic Software Award in 2002 and the Association for Educational Communication and Technology (AECT) Award in 2008. “We want to create a network of people in different countries and continents working together on the same idea.”

The technology was originally developed for high schools, but the worldwide community using it has since developed versions for primary school and even tertiary level.

Some of GeoGebra’s other applications include GeoGebra Mobile, which allows GeoGebra to be used on any smart phone, tablet or touch device, GeoGebra Tube, where files can be uploaded, downloaded and rated by users. Future plans include GeoGebra 3D, for three dimensional geometry which can even be viewed with 3D glasses, and GeoGebra Touch for use on interactive whiteboards or touch screen computers. GeoGebra is also being developed for STEM (Science, Technology, Engineering and Mathematics) education. For instance, a pupil could measure electricity, light or temperature, link their results to their computers, and analyse them using GeoGebra. “We are also looking at working with robots,” said Lavicza.

Prof Piet Naude, Deputy Vice-Chancellor (Academic), said today's learners were comfortable with a "virtual environment" and the challenge for educators was how they could "use technology in an advantageous manner to enhance teaching and learning".

The conference forms part of more comprehensive research and development initiatives linked to NMMU's Govan Mbeki Mathematics Development Unit and its First Rand Foundation (FRF) Chair in Maths Education programmes.