Editorial

The academic year in 2018 started again with a flurry for the GMMDC staff as the annual sponsored value and extent of its mathematics and science development work in schools and colleges grew to over R10 million which is spread across 80 secondary schools in six districts of the ECP. The GMMDC also held its first official advisory board meeting in March after its status was upgraded to an engagement centre late in 2017. The Advisory Board of the GMMDC consists of ten members and include senior officials with a wealth of relevant experience representing the Science and Education faculties of the NMU, Basic Education at both the provincial and national level, the TVET College sector and Umalusi.

A belated re-launch function of the centre was held in March together with the public introduction of a second innovative Android educational application for mobile phones that was developed and tested by the GMMDC over the past three years. The TouchTutor® Quiz application is an exciting and innovative additional support platform that will allow all mathematics learners at secondary schools in the country to freely access curriculum support, self-assessment with feedback and multilanguage support. The application holds great promise for sustainable development at scale as it also allows for the introduction of phone-based competitions and gaming as part of the quest to stimulate interest in STEM related subject at school and college levels. The successful integration of STEAM activities as an extension of development and support for teachers and learners continued with great success in semester 1 of 2018. Five STEAM experiential workshops were held at selected project schools in four districts of the ECP over this period and feedback from all participants and stakeholders were overwhelmingly positive. A fully interactive mobile exhibit to display and showcase ICT-assisted models and projects of the GMMDC was also used for the first time during events in 2018. The exhibit, with accompanying sharing of project information, was presented this year at events such as National Science week, Mandela Centenary Celebrations at Mvezo and National Sci-Africa Festival in Grahamstown. The exhibit was also used to effectively market the Nelson Mandela University and has drawn much appreciation and praise from the public and stakeholders alike. Needless to say, the first semester of 2018 was again an exciting and vibrant period for the centre, full of valuable interactions with key stakeholders as we were building awareness and skills in the interest of Mathematics and Science development.
Have you ever drawn maths?

GMMDC at the National Science Festival
Innovation 4.0; the theme of this year’s 22nd Annual SciFest Africa (South Africa’s National Science Festival) held in Grahamstown from 7-13 March. The festival attracted more than 62,000 visitors and offered a programme consisting of 64 exhibitions (of which the GMMDC was one) and 701 events, presented by 291 contributors from 77 organisations (including NASA). The festival received extensive media coverage, with the GMMDC making their television debut with a Friday morning interview, live on ETV’s Sunrise. The exhibition took a multi-pronged, interactive approach and provided appeal to visitors of all ages. It featured Mathematics and Physical Sciences using Technology as a mediating platform, thus promoting the world-wide STEAM phenomenon. Android tablets and guides were on hand for visitors to explore the TouchTutor® materials. The free TouchTutor® Quiz mobile Android application was also demonstrated, and learners were encouraged to download, register and participate in a SciFest competition where a few prizes were up for grabs. An interactive touch screen was also on display. Learners could take part in hands-on activities where they could build their own 3-D solids using the innovative 4D Frame Kits.

GMMDC’s first ever Math-Art competition

Nelson Mandela University’s Govan Mbeki Mathematics Development Centre (GMMDC) completed the first Math Art competition in May this year. This competition is in line with the international trend incorporating Art into STEM (Science, Technology, Engineering and Mathematics) education. “This is a more modern approach to mathematics where learners are encouraged to explore the links between mathematics and art. Through this modern approach the potential of Mathematics for future careers can be realised”, said GMMDC director Prof Werner Olivier.

This was a competition where the focus was to represent mathematics in an artistic manner. In other words, to create a beautiful 2-dimensional artwork using mathematics. The artworks were judged on the creativity of linking mathematics to art and entrants had to include a 100 to 200 words paragraph describing how they portrayed mathematics in their art project.

The competition, which started on 3 March and ended on 4 May, was open to teachers and learners from the Eastern Cape Secondary Schools. We received 113 entries from 36 schools. We are looking forward to expanding this competition to the whole of South Africa next year.

Winners were announced on 18 May and the prizegiving was on Friday, 25 May at the Nelson Mandela Metropolitan Art Museum. The artworks were exhibited at the Nelson Mandela Metropolitan Art Museum from 18 May to 8 June.

The school with most entries was Get Ahead College from Queenstown and the teacher with most winning entries, Mr Sonwabo Poni from KwaMxaki High School.
Conference links GeoGebra, STEAM Education and creative design

The GMMDC hosted its fifth annual GeoGebra conference for teachers and TVET college lecturers on the 25th and 26th of May this year with the conference theme being “GeoGebra for STEAM education: Linking maths and arts for beauty in design”. This year the GeoGebra conference had a distinct STEAM flavour as it followed an international education trend where science, technology and the arts are promoted through mathematics. The two-day conference was well received by local educators and international guests included one of Europe’s leading researchers in STEAM education, Finland’s Kristof Fenyyesi, a researcher at the University of Jyvaskyla and the vice-president of the world’s largest mathematics, arts and education community, called the Bridges Organisation. From Hungary, there was also Gyorgy Tury, Dean of the Faculty of Communication and Arts at Budapest Metropolitan University and Gabriella Uhl, art historian, curator and associate professor at the same university.

The conference programme included several presentations linking arts and mathematics along with practical sessions, where teachers learnt how to include GeoGebra in their classrooms. A gala prize-giving for a Math-Art school competition which was run by the GMMDC in the second school term, was held at the Nelson Mandela Metropolitan Art Gallery to close the first day of the conference. On May 23, as a pre-conference activity, Fenyyesi, in partnership with the GMMDC, ran an “Experiential Learning Workshop” for 100 pupils and 30 teachers from eight schools in Duncan Village, East London, where participants were given a practical taste of how art and maths connect, as they explored tessellations in 2D and built soccer ball and other Platonic 3D structures. GeoGebra was used during workshop activities to demonstrate and understand the underlying mathematical structures. The experiential learning workshop was extremely well received by pupils who appreciated the opportunity to learn mathematics through art, and to do art through mathematics.

Launch of Duncan Village ITSP

Together with long-time partner and sponsor Old Mutual, the GMMDC has expanded into 8 schools in Duncan Village, East London. The aim of the OM-sponsored Integrated Mathematics and Physical Sciences Support Programme (ITSP) project is to introduce a curriculum-aligned offline Techno-Blended Model (TBM) for teaching and learning of mathematics and physical sciences in classrooms. This model, which is similar to that which was implemented in OM project schools in KWT over the past 3 years, involves structured training and support for teachers and learners.

The ITSP implementation plan for Duncan Village includes a centralized Saturday Incubator School Programme (ISP) for selected performing Grade 11 & 12 learners from all 8 project schools. Fifty learners per grade will be targeted and the contact sessions of the Tablet and TouchTutor® assisted Saturday programme will be offered at the Gomo Learning Centre. For learners who do not receive Tablets to take home, access is provided through structured after school Maths and Science support (TAPS) with Tablets and TouchTutor® material on a regular basis. Also, a Professional Learning Network programme (PLN) for in-service Mathematics teachers which includes technology, pedagogy and content knowledge training and provision of laptops, data projectors and digital T&L resources for the classroom.
New TouchTutor® Quiz application

The TouchTutor® Quiz was developed by the GMMDC in collaboration with IT company AvoChoc, and was created to make learning material, language support, assessment and practise for maths and science freely available to all learners on their own mobile devices. The app is aimed at high school learners and teachers primarily but can cater for revision purposes for College and University students. Users should be online to register and to download tests but may use downloaded material offline. Results are uploaded and recorded once the user is online again. Question types include multiple choice, matching, sequencing, true or false, numerical and text answers. The GMMDC plans to expand participation in its annual online maths and science competitions as well as continue to add to the range of questions and tests. The new app has been gamified by the inclusion of a leaderboard and tokens. In future, the Centre intends to offer a commercial service for customised assessment. The updated TouchTutor® Quiz app can be downloaded from the Google Play store on any mobile device.

GMMDC in the news

Offline tablets see marks flying

The Centre’s new free app now allows students to select from a wide range of questions and tests, and receive immediate feedback. The app is designed to be used off-line, so students can work on it without an internet connection. It also includes a feature that allows students to share their progress with their teachers and peers.

Maths, science is now on the phone

The new app is available for free on Android devices and is designed to provide offline access to maths and science content. This means that students can continue to learn and practice even when they don’t have internet access. The app includes a range of questions and tests, as well as interactive feedback to help students improve their understanding. The GMMDC is committed to providing free and accessible resources to support learners, and this new app is just one example of how we are working towards this goal.