

Solving the maths problem with paper

South Africa's maths and science education was ranked second last by the World Economic Forum (WEF) Global Information Technology Report in 2013 – a particularly worrying fact for the paper industry, where maths and science literacy are key not only to research and development but also to process operators on the floor.



A report in the Mail and Guardian (7 January 2014) added to these woes, conveying that there is a worrying decline in the number of candidates writing mathematics at National Senior Certificate level and a concern over the quality of passes achieved. "Several international studies and the Annual National Assessment results indicate that the problem with mathematics has its roots in primary school, where many learners fail to gain basic mathematical skills," states the report. "Less than half the learners in each cohort show foundational competence in mathematics, as indicated by the 61% of grade six learners who failed to score 50%."

TAPPSA chairman Iain Kerr echoes that mathematics is an essential foundation subject in the engineering disciplines. "In recent years first year engineering students were struggling to pass at first year university level, which is an indication that they were – and are – not receiving the mathematical skills at school level to enable them to study mathematics at tertiary level." He adds that universities are as a result starting to implement programmes to assist these students, including providing the students with extra tuition on Saturdays.

EMPOWERING EDUCATORS THROUGH PAPER

As the world continues to push aside paper in favour of paperless and replace textbooks with tablets, there is a paper-based project that is doing wonders for South African educators all over the country. SATeacher, a professional education and curriculum development agency, has made inroads in Gauteng and the Western Cape through a project backed by the Paper Recycling Association of South Africa (PRASA) and funded by the Paper Manufacturers Association of South Africa (PAMSA), with contributions from Forestry South Africa.

The teacher-training project has involved the incorporation of a paper and recycling component into the Foundation and Intersen Phase school curriculum and enables educators to make use of paper-based resources to teach maths in a way that can be internalised and understood.

PRASA operations director Ursula Henneberry says, "The Gauteng-focused pilot phase was launched in 2012 and reached 1,726 schools, 40,000 educators and 1,25 million Grade R to 7 learners. Not only are we helping children with foundational mathematics, but we are using paper-based DBE and SATeacher workbooks, lesson plans as well as guidelines for easy-to-make paper resources to share the paper story."

The Western Cape roll-out and teacher-training workshops were well received by some 1,000 participants representing 20,000 educators of 1,300 schools with a collective 700,000 learners. The roll-out to KwaZulu-Natal commences in August. "We must commend the Department of Basic Education for embracing the initiative and its endorsement of the project," says Henneberry.

HOW DO I LEARN WITH PAPER? LET ME COUNT THE WAYS

Blom explains, "The mistake we often make is to get children to memorise maths; we then test this memorisation. Instead, for there to be deep understanding and connection with maths, we need to be practical – using our brains, eyes and hands and fingers – which is why we use the CRA (concrete-representative-abstract) method."

Paper resources are integral to this learning process, enabling teachers to have concrete and representational materials that make mathematical concepts easier to explain in a tangible manner. Blom concludes: "It is our job as parents, as educators, as professionals in the pulp and paper industry, to show young people that maths makes up every aspect of our world." ■

Dreyer Lötter and Liezel Blom founded SATeacher in 2003 to focus on the professional development of teachers in South Africa. This gave rise to develop structured teaching plans and resources, based on the South African curriculum. To date, SATeacher developed and published hundreds of titles and the materials are used in every school in South Africa.