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You are cordially invited to an...

NSTF Workshop on Science, Technology, Engineering and Mathematics (STEM) Education

16 April 2010

**Old Mutual-MTN Science Centre, Shop E032, Gateway Theatre of Shopping Centre,
no1 Palm Boulevard, Umhlanga Ridge, Newtown Centre, Kwa-Zulu Natal**

Map and Directions: <http://www.gatewaysciencecentre.co.za>

9:15 to 15:30

This is the second of three STEM Education workshops planned for this year. The first was held in Cape Town on 10 March, and the third will be held in Pretoria in September. The proceedings of the Cape Town workshop can be downloaded from www.nstf.org.za, under 'workshops'.

At this next NSTF workshop in Durban, which forms part of an ongoing series of STEM workshops to promote dialogue with Government, we would like to hear your insights, your critical appraisal of government policies and recent developments, and your constructive ideas of how to take South Africa's young people forward towards a brighter future.

What do Forum Members think of the recent developments in STEM Education at school level? Everyone knows by now that we are dealing with a crisis in Education, and that it affects South Africa's skills base of the future and our aspirations for a *knowledge economy*. But does everyone know what efforts the national government has been making to turn the system around? There are also numerous positive efforts at local level, by Provincial Education Departments, and private sector and NGO initiatives.

Background

The Parliamentary Portfolio Committee on Education was recently (3 February 2010) briefed on the National Senior Certificate Results of 2009, by the Department of Basic Education and UMALUSI.

The minutes can be read on the Parliamentary Monitoring Group (PMG)'s website: [Download](#). And [key extracts](#) from the presentation and the subsequent discussion can be read on the NSTF's website.

In November last year a special Task Team which was set up by the Department of Basic Education completed its [Review of the implementation of the National Curriculum Statement: Report of the Task Team](#).

This review was initiated in response to criticism of the implementation of the National Curriculum Statement, teachers' work overload and learner underperformance in local and international assessments. Ms Angie Motshekga, Minister of Basic Education, announced that from 2010 learner portfolios would be discontinued, and teachers would require only one administrative file... A set of clear, coherent curriculum and assessment documents would be developed, communicated and implemented in 2011. The department was seeking to shift the focus of teachers from being fully administratively compliant but having little time to spend really teaching, to one where effective teaching ensured that pupils were learning. It was looking to provide a uniform set of grading descriptors for all grades and to reassert the role of textbooks. In 2010 the Department would develop a detailed syllabus for implementation in 2011. The Minister noted that the Department was currently refining the norms and standards for educators and were looking at the curricula of Higher Education Institutions and how responsive they were.

At the previous NSTF workshop held in Pretoria, on 17 AUGUST 2009, presentations were heard by the following speakers:

Dr Nhlanhla Nduna-Watson, Department of Basic Education

Dr Eric Khoza, Denel Youth Foundation Training Programme (DYFTP)

Aarnout Brombacher, Brombacher and Associates

Dr Vijay Reddy, Director: Education, Science and Skills Development Programme, Human Sciences Research Council (HSRC)

The following issues were identified from the presentations and discussions, for the purpose of formulating recommendations to Government and follow-up discussions:

Teacher training and development

- A national initiative to support and capacitate teachers in the system is urgently needed. This initiative must coordinate the various efforts around the country and draw on the expertise and support of, for example, science centres and subject specialists in higher education.
- Ways should be found of replicating successful models and teaching practice.
- Incentives may be needed to keep capable mathematics and science teachers in the teaching profession, e.g. lucrative bursaries.

Effective teaching

- It is important to consider how learners learn rather than simply measuring the output in terms of examination results. Understanding should be valued, rather than just results. We should start concentrating on improving skills and abilities.
- Consideration was given to adding an additional year of school to enable learners to achieve the requirements to get into tertiary education.

Early childhood development and the Foundation Phase

- The importance of early learning as a foundation should not be overlooked. The earlier the interventions are made, the higher the returns on that investment.

Life orientation

- Life orientation is effectively taught in schools and that the career counselling aspects should not be neglected. Career counselling should empower learners by giving them a vision of what they can become.
- A weakness of life orientation and career guidance is that learners are not adequately advised which subjects to take in order to follow a particular career.

Mathematical literacy

- We need to develop a shared sense of what it means to do mathematical literacy.
- In early discussions between higher education and the DoE, there was an agreement that higher education would be able to ask the DoE for the marks on the second mathematical literacy paper, which would be used as the basis for admission to certain university programmes. This discussion should be resumed.
- Consideration should be given to making mathematical literacy compulsory, as initially envisaged, but taught as a separate life skill from life orientation. Considerations in doing so might include lower time allocation and credit allocation than for other subjects, as well as examination by means of an internal portfolio.

Mathematics

- We need to develop a shared sense of what it means to do mathematics in the modern world.
- Higher education institutions need to start documenting the skills gaps among students so that these issues can be addressed in the school curriculum.
- Developing problem-solving skills must not be neglected in the teaching of mathematics.

Physical science

- Higher education institutions need to start documenting the skills gaps among students so that these issues can be addressed in the school curriculum.
- There may be a need to institute an alternative physical science subject that is more engineering oriented for learners that intend to enter the vocational world and exercise a trade after leaving school.

Assessment

- The issue of assessment and over-assessment in the education system was raised. We have to consider the place of assessment.

Exemplar papers

- There may have been too much repetition between the exemplar papers and the final papers prepared for the 2008 national senior certificate examination.

Second opportunities

- There is support for second opportunities at various stages in education. We should perhaps consider which stages those should be, as well as what kind of second opportunities to promote.
- We do not seem to give enough hope to children that fail grade 12 or do not get sufficiently good marks to get into their chosen course of study.

Focusing on the ultimate objective of education

- Effective education in science and technology is preparation for the world of work. The important issue is not so much the results that learners achieve in matric but what they go on to do afterwards.
- Science, technology, engineering and mathematics (STEM) learning is a means to an end, with the goal of sending learners into society to make a useful contribution.

We hope to take these insights and issues to a new level through our discussions this year, to interact with the Provincial Education Departments and the National Department of Basic Education, and contribute to policy formulation and implementation.

PROGRAMME OUTLINE

- 9:15-9:30 Registration
9:30-9:40 Welcome, announcements, introductions
9:40-10:10 The discussion thus far – outcomes of the previous workshops
10:10 – 13:15 Presentations and discussions: Current National Education Initiatives
- Education Department representatives
 - The Mathematics Curriculum – Mr Aarnout Brombacher, Brombacher and Associates cc
- 13:15 - 14:00 Lunch
14:00 – 15:15 Presentation and discussions
- Overcoming the Education and Development Trap: Investments in Education – Dr Vijay Reddy, Executive Director: Education, Science and Skills Development Programme (ESSD), Human Sciences Research Council (HSRC)
- 15:15 – 15:30 Wrapping up and way forward

We invite you to join us for lunch, and use the opportunity for further discussion and networking.

REGISTRATION INFORMATION

- **Member Organisations** = Attendance, parking, workshop refreshments and lunch are **free of charge** for NSTF Members – see the list of member organisations on the NSTF web site at www.nstf.org.za or enquire from the NSTF contact person mentioned below. Member organisations are allowed to send as many representatives as they wish to.
- **Non-Member Organisations** = Attendance is open for anyone interested **but** non-members are charged **R1000.00 (VAT incl) registration fee** which include attendance, parking, workshop refreshments and lunch. **OR** non-members are **invited** to become members at a nominal annual membership fee and then participate free of charge throughout the year – see the members section on the web site at www.nstf.org.za or enquire at the contact person mentioned below.

*Please forward this invitation to your colleagues. It is however, essential to book!! **R.S.V.P. to Tshogo at nstf@scientia.co.za or 012 8413987.***

Please note that if you do not RSVP to this address with your name, name of the organisation you represent and contact details, we cannot be held responsible for changes or cancellations of programmes.