

Inputs from the Department of Basic Education to the Commission of Inquiry into Higher Education and Training (the Fees Commission)

September 2016



Presentation Outline

- Introduction
- **Gradual improvement** in the basic education sector but much still to be done
- The National Senior Certificate – a systemic and systematic move to an **improved quality school-leaving certificate** from the former Senior Certificate
- Attempts to **improve the quality** of the NSC and NSC graduates
- **Lessons for Higher Education** from the Basic Education sector

• Conclusion



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INTRODUCTION



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Introduction

- There is **solid evidence** that the quality of schooling is improving off a low base. The improvement could be a bit faster, yet **it is fast by global standards.**
- School education, like post-school education, has experienced challenges of high repetition and dropping out, and to ‘user fees’. The **two sectors should learn from each other.**

Still a problematically low level of performance

- 60% of youths complete twelve years of education successfully – fairly typical for a middle income country.
- 21% of youths achieve school-level results allowing them entry to a university – this is a bit low by global standards.
- The International Maths and Science Study of 2011 puts SA's Grade 9 learners about two schooling years behind Botswana's in Mathematics (in 2011).

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GRADUAL IMPROVEMENT IN THE BASIC EDUCATION SECTOR



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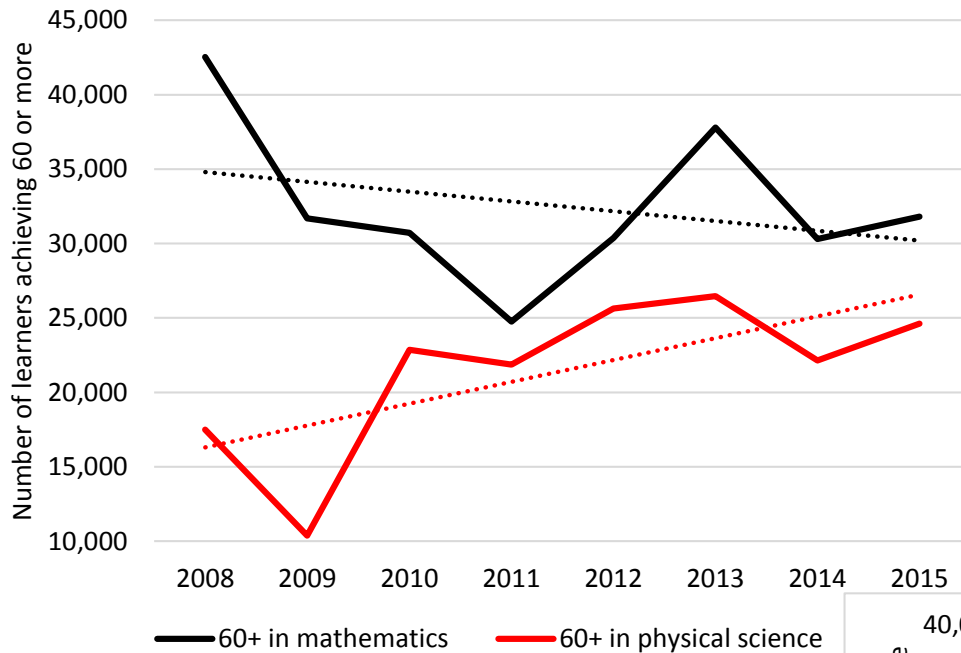


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But substantial improvements have occurred

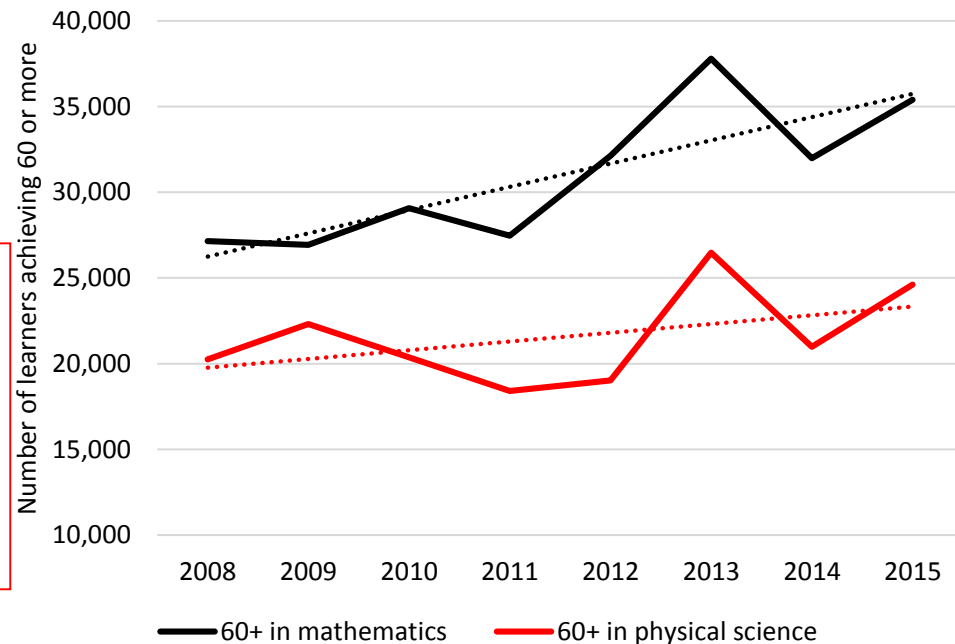
- A comprehensive analysis by DBE points to 'high-level' Mathematics achievers (those getting a 60% mark) in Grade 12 increasing from 26,000 to 34,000 (2008-2015).
- The increase for black African learners in the period was 11,000 to 19,000 (65% increase).
- TIMSS has pointed to Grade 9 improvements from 2002 to 2011 of around 0.07 standard deviations a year, which is a speed of improvement comparable to the best improvers.

But substantial improvements have occurred (contd.)



Before adjustments. Strange inconsistencies across subjects. Moreover, mathematics declines for all four race groups.

After benchmarking against a small group of high-performing and stable schools. Over the period 65% increase in black African high achievers (60+) in mathematics.



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THE NATIONAL SENIOR CERTIFICATE – A SYSTEMIC AND SYSTEMATIC MOVE TO AN IMPROVED QUALITY SCHOOL-LEAVING CERTIFICATE



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The National Senior Certificate – evidence and perceptions

- **Evidence** is weak and somewhat contradictory on the trends in average competency levels of students entering university. But **the perception** is that there has been a decline.
- This **perception** is not incompatible with improving schooling outcomes. A lot depends on the speed of school improvement vis a vis the speed of university enrolment growth.

What is the evidence on the NSC

- **Intensive preparation** for the first NSC in 2008
- **Involvement of HEIs** and Higher Education South Africa (HESA) in the NSC
- **International bench-marking** of NSC subjects
- **University tracer studies** of NSC cohorts
- **Subject studies** across cohorts

Preparation for the first NSC in 2008

- ✓ The NSC was benchmarked with the UK. The exercise found the NSC broadly comparable to the GCE AS-level and the Advanced Programme in Mathematics reflective of the GCE A Level.
- ✓ In 2002 the old Senior Certificate question papers were bench marked with the Scottish Qualification Authority in order to improve the quality of the National Senior Certificate papers
- ✓ In 2007 ten NSC subjects were benchmarked with the Scottish Qualification Authority, Cambridge International Examinations and Board of Studies New South Wales (Australia)

Preparation for the first NSC in 2008

- Higher Education Institutions played a pivotal role in curriculum reform post 1995.
- Individual faculty participated in the reviewing developing, evaluating and critiquing the National Curriculum Statement 2007 (FET Grade 10-12) and the National Curriculum Statement 2012.

NSC Tracer studies : Wits study

- A study undertaken by the University of Witwatersrand suggests that the NSC examination results are a fair predictor of success of students in their first year of study.
- The study found that 2008 NSC students performed similarly to previous cohorts in reading intensive courses or where group work and project-based learning are important components of the course but the NSC students who entered university in 2008 struggled in the mathematics and science courses.

NSC Tracer studies : UP study

- In 2010 the University of Pretoria, evaluated the performance of the 2009-intake of students with respect to general performance, general attributes, mathematical attributes and content related attributes.
- In many instances it was found students were weaker than their predecessors with respect to mathematical and content related attributes.
- Yet, there were positive indications that these students adapt and improve over a semester.

2011 International Benchmarking: General findings

Seven NSC subjects were benchmarked with three examination authorities: Scottish Qualification Authority, Cambridge International Examinations, Board of Studies of New South Wales and Higher Education South Africa

The main finding:

The NSC is suitable for SA university entrance, but differs from the Cambridge AS level in the higher order thinking skills assessed. In comparison to Cambridge papers **the scope and depth of the content is generally appropriate for Grade 12** but more ‘higher order thinking’ questions should be included; too many questions rely on knowledge and routine procedures rather than complex procedures and problem solving.

2011 Benchmarking: Subject Findings

- ✓ The standard of **Mathematics** question papers was considered to be comparable to the standard of all three examining authorities. However, HESA was sceptical about the level of difficulty of the questions and their appropriateness in preparing learners for higher education.
- ✓ The standard of **Life Sciences** question papers considered to be comparable to standard of CIE.
- ✓ The standard of **Accounting** question paper considered to be comparable to the standard of the advanced level of SQA and considered to be of high standard by HESA.
- ✓ Limited opportunities for learners to demonstrate higher order thinking skills in History, Geography, English FAL, Physical Sciences.

The 2014 Ministerial Committee findings

Report of the Ministerial Committee to investigate the current promotion requirements and other related matters that impact on the standard of the national senior certificate

Led by Professor Brian O'Connell

Findings included...

- Standards in NSC have been improving, as has quality of papers and processes.
- Local and international criteria had still not been fully met.
- Serious negative perceptions in the public mind around the credibility of standards.

The 2014 Ministerial Committee findings (contd.)

Recommendations included...

- Raise the Bachelors/Diploma bar, e.g. by not allowing any failed subjects.
- Raise standards in Language of Learning and Teaching (mainly English), e.g. through deeper comprehension questions. Also better calibre of markers.
- Curriculum stability emphasised.
- More rigorous process for production of examination papers.

Evidence: Standards in Grade 12 papers

- A recent DBE analysis has established equivalent marks over 2008 to 2015 period, using stable high-performing schools as an anchor.
- Small shifts are visible, shifts which are largely inevitable in an examination system such as ours.
- These shifts should be considered when making comparisons of average results or individual students over years.
- Clearly, there has been no general trend of papers being less demanding. Shifts are in different directions, depending on the subject.

Understanding Grade 12 subject marks (contd.)

Equivalent marks at mark level 60 for several key subjects

	2008	2009	2010	2011	2012	2013	2014	2015	Δ
Mathematics	70	63	62	58	60	60	59	59	-1.2
Physical science	58	50	62	63	65	60	61	60	0.8
Accounting	61	62	58	59	62	58	59	60	-0.2
Agricultural sciences	49	55	57	61	58	62	62	63	1.7
Business studies	58	59	58	62	61	63	58	59	0.2
Economics	57	61	65	54	63	59	60	56	-0.3
Geography	59	60	59	60	59	62	60	61	0.3
History	56	55	61	61	58	60	60	63	0.8
Life sciences	63	61	63	61	59	60	57	59	-0.7

Efforts by the basic education sector to improve the NSC

- (a) Increased Cognitive Demands in the question papers
- (b) Assessment tasks and examination question papers
- (c) Test Administration
- (d) Marking
- (e) Learner Performance

INCREASE IN COGNITIVE DEMANDS

The consistency of mathematics papers

- A key accountability and quality assurance element with regard to the mathematics examination is work with AMESA (Association for Mathematics Education in South Africa).
- Since 2009, AMESA has assessed the quality Grade 12 mathematics and mathematical literacy examination papers.
- Overall conclusions have been favourable, but some criticisms made. In particular, AMESA has warned *against* raising the difficulty of mathematics papers.

Increased Cognitive Demand

Example: Physical Science P2

2014	2015
<p>The flow diagram below shows the processes involved in the industrial preparation of fertiliser Q.</p> <p>Using a flow diagram provided:</p> <p>Write down the:</p> <p>10.1.1 NAMES or FORMULAE of the reactants used in the Haber process</p> <p>10.1.2 Balanced equation for the formation of fertiliser Q</p>	<p>Question 10 (27 marks)</p> <p>Ammonia is an important fertiliser. Large amounts are prepared from hydrogen and nitrogen in industry.</p> <p>10.1 For the industrial preparation of ammonia, write down:</p> <p>10.1.1 The name of the process used (1)</p> <p>10.1.2 A balanced equation for the reaction that occurs (3)</p> <p>10.1.3 The source of nitrogen (1)</p> <p>10.2 The yield of ammonia changes with temperature and pressure during its industrial preparation. The graphs below show how the percentage of ammonia in the reaction mixture that leaves the reaction vessel varies under different conditions (Graph attached).</p> <p>10.2.1 Use the appropriate graph to estimate the percentage of ammonia present in the reaction mixture at 240 atmosphere and 400 °C. (1)</p> <p>10.2.2 State TWO advantages of using high pressure in the preparation of ammonia. (2)</p>

Assessment Tasks and Question Papers

Each year DBE endeavours to establish a common understanding and application of standards across all levels of the system through:

- examples of assessment tasks and assessment evidence.
- training in the development of assessment tasks and marking.
- rigorous and extensive quality assurance procedures

Standard setting in question paper development

- (c) Increased rigour in moderation and review of question papers:
- ✓ **Internally moderated** by an independent subject expert
 - ✓ **Externally moderated** by Umalusi panel of moderators (includes university subject experts)
 - ✓ Rigorous quality **assurance processes**
 - ✓ **Pre-test takers/ scrutinizers** and **feedback** for final refinement

Examination Administration

- (a) Examinations are administered across all examination centres based on compliance to the *Regulations pertaining to the Conduct, Administration and Management of NSC examinations and Assessment*.
- (b) Intensive monitoring of examinations by DBE, Umalusi, PEDs and other stakeholder bodies.
- (c) Audit of all examination centres, storage points and nodal points.
- (d) Common National Manual for Examination Invigilation.
- (e) Systems of detection, investigation and subsequent management of examination irregularities.
- (f) Umalusi oversight over the examination administration and final declaration by Umalusi on the integrity of the examination.

Marking Enhancements

- a) All markers appointed in accordance with common national criteria stipulated in National Policy.
- b) Process of marker selection monitored by DBE and final marker appointments audited by the DBE and Umalusi.
- c) National Standardisation meeting to ensure that marking in each of the subjects is executed in accordance with a nationally agreed guideline, approved by Umalusi.
- d) National and provincial training of markers, using “live” scripts.
- e) Introduction of control measures relating to adherence to tolerance range and marker authorisation.
- f) External moderation of marking by DBE and Umalusi.

Analysis of Learner Performance

- a) DBE conducts an intensive analysis of the examination data on an annual basis and this includes :
- consolidation of findings of markers based on their evaluation of learner responses.
 - post test analysis of individual learner responses per individual test items.
 - statistical analysis of learner performance at national, provincial, district and school level.
 - development of a diagnostic report per subject.
- b) The above analysis is used to improve the quality and standard of the question papers and to assist teachers in the construction of remedial programmes to address the learning deficiencies.

Some ideas on university 'throughput'

- Essentially around 30% of youths 'drop out' in the sense that they do not even enter a twelfth year of education.
- At any point, around 12% of learners are repeating their grade.
- The SA university 'throughput' rate of around 50% is clearly problematic. But it is noteworthy that many other countries, including the United States, face a similar situation.
- In schooling and post-schooling, there is probably a need to think a bit differently about what constitutes 'failure'.

Fees: Lessons from the schooling sector

- Experiences in schooling sector in years following 2000 reflects what was arguably a successful achievement of a difficult balancing act between different priorities:
 - Pro-poor public spending
 - Nation-building and inclusive institutions
 - Budget constraints
 - Satisfying emerging black middle class aspirations
 - Creating an environment for dynamic school management
 - Making funding systems as simple as possible
 - Having good monitoring going forward

WHAT IS THE VALUE OF THE MATRIC CERTIFICATE IN THE LABOUR MARKET?

*Clare Hofmeyr, Nicola Branson, Murray Leibbrandt,
Cally Ardington, David Lam (14/10/13), UCT*



SUMMARY OF FINDINGS

- Increasing levels of youth **unemployment** and learners' **poor performance** at school have led to claims that the matric certificate no longer has **much value** in the labour market.
- However, the **evidence** does **not support** this claim.
- While the **labour market** conditions facing secondary school **graduates** have indeed **worsened** with time, the **value** of a matric certificate relative to that of **grade 10 and 11** has remained **positive** both in terms of **earnings** and the likelihood of finding **employment**.



SUMMARY - FINWEEK ARTICLE

Matric continues to carry **weight** in the labour market. Worsening labour market outcomes of matriculants should not be confused with a negative valuation of the matriculation certificate relative to fewer years of education. While there has been a net decline in the absolute return to matriculation – consistent with an increased supply of matriculants and a deteriorating quality of education – the earnings premium of matriculants compared to those with only grade 10 or 11 has remained positive and relatively stable across generations.

SUMMARY - FINWEEK ARTICLE...

Similarly, matriculation continues to **improve** the odds of **employment**. This **evidence** helps us to understand **why** South African **youth** still **endeavour** to **attain** the matric certificate, even under very **difficult** circumstances.

Conclusion

- We must accept our schooling outcomes are unacceptably low.
- **Poor results are not the same thing as no improvement.** The speed of improvement is to some degree something we can benchmark.
- There is some variation in the meaning of subject marks from one year to the next.
- What would be an acceptable 'throughput' at universities? A critical but complex question.
- The schooling sector has grappled with the difficult matter of 'user fees', many would argue successfully.

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Thank you!

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