



The Skills Dilemma facing South Africa

Robin Crewe

President: ASSAf

Previous & Forthcoming Initiatives

- ❑ PROMOTING SOUTH AFRICAN S&T CAPACITIES FOR THE 21ST CENTURY: FROM POLICY TO REALITY -ASSAf Report 2003
 - ❑ Human Resources for Knowledge Development in South Africa –DoE & DST – Cape Town 2005 –practical interventions to overcome skills shortage
 - ❑ Variety of Sectoral Workshops
 - ❑ OECD Review 2007
 - ❑ SARChI – 210 chairs by 2010
 - ❑ DST 10 year plan + Human Capital Development Initiative
 - ❑ NRF Ph.D. initiative
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ASSAf Report Recommendations -2003

- ❑ Too few matriculants with higher grade mathematics and science
Brain gain hampered by difficulties in obtaining visas / work permits for foreign S&T professionals wanting to work in SA
Insufficient and insufficiently qualified and experienced maths and science teachers, and frequently inadequate academic background of school-leavers
- ❑ Ageing profile of academic workforce is seen as a looming crisis
- ❑ The threat of HIV/AIDS to future SA S&T capacity
- ❑ An academic system that is not reproducing its own capacity
Brain drain (e.g. via emigration)
- ❑ Loss of black researchers (e.g. to jobs in government and industry)
- ❑ Context of globalisation in which SA's S&T operates creates new vulnerability (e.g. greater mobility of SA's researchers, outsourcing of R&D to research groups outside SA)

Diagnosis of the Disease

OECD- 2007

- Poor quality schooling for many citizens
- Human resource shortages at all levels in mathematics, science and technology
- Lack of design, engineering, entrepreneurial and management actors (DEEM) and R&D capacity leading to an “engineering gap”
- Ageing, white, male dominance of industrial and academic R&D.
- Mental models of how the innovation system operates overly focused on the role of the state
- Governance of the state components of the innovation system insufficiently holistic
- Strategy implementation capacity in the state’s part of the innovation system
- Use of “level playing field” idea in funding higher education impedes the development of new institutions

Historical Perspective on Skills Acquisition

Labour Intensive

- Slavery
- Indentured labour
- Skilled labour - wheelwrights in Cradock, Dutch civil servants in ZAR and Welsh miners in Johannesburg

Knowledge Intensive - Developed, Emerging & Undeveloped Economies.

- Attract postgraduate students - $UE > E > D$
- Attract highly skilled individuals $UE > E > D$
- South African as stepping stone

The competitive environment

- ❑ UK - Sainsbury Report - *The Race to the Top* - Strategy to be a winner in Science and Technology 2007
 - ❑ Canada - *Mobilizing Science and Technology to Canada's Advantage 2007* - *Talented, skilled, creative people are the most critical element of a successful national economy over the long term.*
 - ❑ USNAS - *Rising above the gathering Storm 2005*- Broad Federal Effort Urgently Needed to Create New, High-Quality Jobs for All Americans in the 21st Century
 - ❑ Germany 2007 - "Germany's future depends on first-class research, creative talent, and high-quality education and training that are geared toward international standards as well as a fair deal for everyone, irrespective of social or ethnic background, who is willing to contribute to our society. Dedicated people and pioneering spirits are our greatest assets. An important goal of the German government's science policy is to encourage the creative talent of everyone who lives, works, or conducts research in Germany and to ensure that their working conditions and quality of life are continually improved." Angela Merkel
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USNAS report -Highlighted Recommendations

- Recruit Maths. and /science Teachers
 - Strengthen skills of current Maths. & Science Teachers
 - Enlarge pipeline of students studying Science, Engineering & Maths.
 - Increase investment in basic research by 10% a year for 7 years
 - Provide substantial grants to the most outstanding young researchers
 - Invest in advanced research instrumentation and facilities
 - Improve visa processing for international students & scholars.
 - Provide 1 year automatic visa extension to international students who complete doctorate
 - Institute new skills based preferential immigration policy
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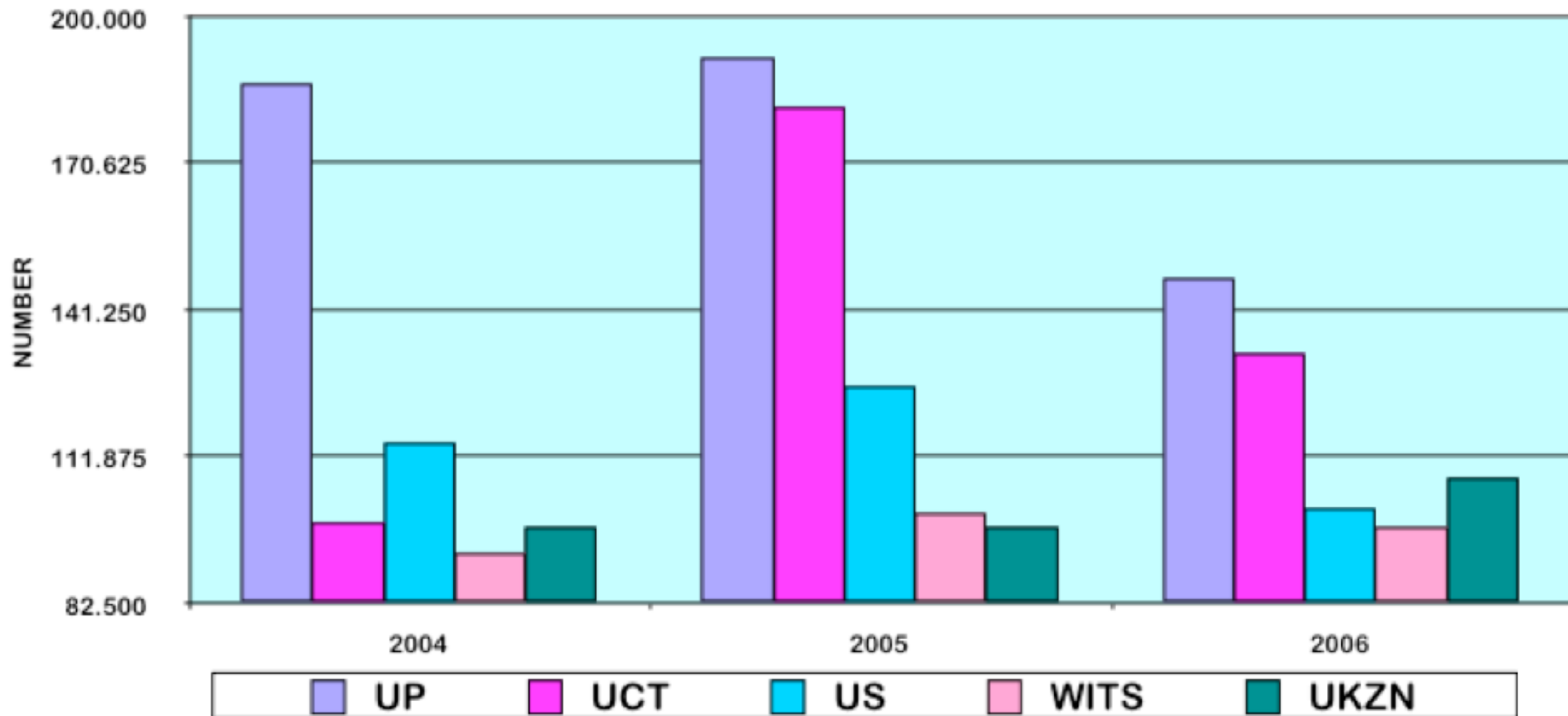
USNAS report -Company criteria for locating business in a country

- Cost of labor (professional and general workforce).
 - Availability and cost of capital.
 - Availability and quality of research and innovation talent.
 - Availability of qualified workforce.
 - Taxation environment.
 - Indirect costs (litigation, employee benefits such as healthcare, pensions, vacations).
 - Quality of research universities.
 - Convenience of transportation and communication (including language).
 - Fraction of national research and development supported by government.
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USNAS report -Company criteria for locating business in a country 2

- Legal-judicial system (business integrity, property rights, contract sanctity, patent protection).
 - Current and potential growth of domestic market.
 - Attractiveness as place to live for employees.
 - Effectiveness of national economic system.
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Production of Doctoral Graduates at Research Universities in South Africa



Assessment of a National Crisis

- ❑ Commission a national study to identify the top 10 interventions to ensure globally competitive innovation system by 2050
 - ❑ Move SA from C league 27 Ph.D.s/million to B league 100 Ph.D.s/million - 6000 S & T Ph.D. graduates per year
 - ❑ Make recommendations regarding the co-ordination of the national effort between government, private sectors and the Universities
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Commissioned study by ASSAf

- ❑ Postgraduate Studies in SA, and the development of human capital in S&T: to be proposed after multi-sector inputs
 - ❑ Interested parties - NRF, NACI, DST, DoE, CHE, HESA, research intensive industry
 - ❑ Requires cabinet level support - Canadian report with forwards by Prime-minister, Minister of Industry, Minister of Finance
 - ❑ Study with recommendations to be completed by March 2009.
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