Internationalisation; Research & Innovation in South Africa’s universities

Presentation to the Portfolio Committee on Higher Education and Training, Cape Town
Wednesday, 3 September 2014

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PRESENTATION OUTLINE

1. SIZE ; SHAPE AND FUNDING OF THE HE SYSTEM
2. INTERNATIONALISATION
3. RESEARCH AND INNOVATION
4. CONCLUSION
The South African Post-school System 2012


University students
1 050 860
- Public 953 373
- Private 97 487

College students
773 276
- Public 657 690
- Private 115 586

Adult education & training students
315 068
- Public 306 378
- Private 8 690

18 to 24-year-olds
Not in education, employment or training
2 945 018
Higher education income sources, ZAR (billion)
(Source: DHET, Financial Statements in Annual reports submitted by Universities)

<table>
<thead>
<tr>
<th>Year</th>
<th>Government</th>
<th>Student fees</th>
<th>Third stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>15.93</td>
<td>7.80</td>
<td>8.78</td>
</tr>
<tr>
<td>2010</td>
<td>19.89</td>
<td>15.66</td>
<td>14.08</td>
</tr>
</tbody>
</table>
Expenditure on higher education as % of GDP, 2010

(Source: OECD, downloaded from http://data.uis.unesco.org)
## Student Enrolment

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013 (preliminary)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total number of students</strong></td>
<td>892 943</td>
<td>938,200</td>
<td>953 373</td>
<td>983 698</td>
</tr>
<tr>
<td><strong>Total number of international students</strong></td>
<td>66 181</td>
<td>70 060</td>
<td>72 857</td>
<td>73 859</td>
</tr>
<tr>
<td><strong>Number of students (FTE)</strong></td>
<td>600 002</td>
<td>628 409</td>
<td>634 548</td>
<td>665 857</td>
</tr>
<tr>
<td><strong>Post-graduate students</strong></td>
<td>138 610</td>
<td>147 893</td>
<td>149 027</td>
<td>159 750</td>
</tr>
<tr>
<td><strong>Post-graduate students (international students)</strong></td>
<td>18 845</td>
<td>20 046</td>
<td>20 770</td>
<td>23 364</td>
</tr>
</tbody>
</table>
# Academics

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013 (preliminary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of permanent instruction and research staff</td>
<td>16 684</td>
<td>16 935</td>
<td>17 451</td>
<td>17 838</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRICAN - TOTAL</td>
<td>4 767</td>
<td>5 077</td>
<td>5 430</td>
<td>5 754</td>
</tr>
<tr>
<td>Female</td>
<td>1 781</td>
<td>1 893</td>
<td>2 036</td>
<td>2 172</td>
</tr>
<tr>
<td>Male</td>
<td>2 986</td>
<td>3 184</td>
<td>3 394</td>
<td>3 582</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOURED - TOTAL</td>
<td>964</td>
<td>1 034</td>
<td>1 077</td>
<td>1 122</td>
</tr>
<tr>
<td>Female</td>
<td>470</td>
<td>509</td>
<td>529</td>
<td>559</td>
</tr>
<tr>
<td>Male</td>
<td>494</td>
<td>525</td>
<td>548</td>
<td>563</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013 (preliminary)</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>INDIAN-TOTAL</strong></td>
<td>1,424</td>
<td>1,451</td>
<td>1,477</td>
<td>1,505</td>
</tr>
<tr>
<td>Female</td>
<td>672</td>
<td>700</td>
<td>721</td>
<td>734</td>
</tr>
<tr>
<td>Male</td>
<td>752</td>
<td>751</td>
<td>756</td>
<td>771</td>
</tr>
<tr>
<td><strong>WHITE-TOTAL</strong></td>
<td>9,320</td>
<td>9,162</td>
<td>9,261</td>
<td>9,206</td>
</tr>
<tr>
<td>Female</td>
<td>4,384</td>
<td>4,408</td>
<td>4,486</td>
<td>4,537</td>
</tr>
<tr>
<td>Male</td>
<td>4,936</td>
<td>4,754</td>
<td>4,775</td>
<td>4,669</td>
</tr>
<tr>
<td><strong>UNKNOWN RACE-TOTAL</strong></td>
<td>209</td>
<td>211</td>
<td>206</td>
<td>251</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>53</td>
<td>48</td>
<td>53</td>
</tr>
<tr>
<td>Male</td>
<td>163</td>
<td>158</td>
<td>158</td>
<td>198</td>
</tr>
<tr>
<td><strong># OF FOREIGN ACADEMICS</strong></td>
<td>1,490</td>
<td>1,723</td>
<td>2,137</td>
<td>2,281</td>
</tr>
</tbody>
</table>
Funding

1. State funding of higher education (in real terms) has been declining over the years;

2. In 2011, state budget for universities as % of GDP was 0.75% compared to 0.78% for Africa as a whole; and 1.21 OECD countries;

3. Student tuition fees and third stream income are under pressure;

4. Funding for infrastructure (notwithstanding Infrastructure Efficiency Grant), does not match the current and projected growth of the system;

5. Student-academic FTE ratio has been deteriorating over the years.
INTERNATIONALISATION
Why internationalisation is important

1. Improved quality of teaching and learning as well as research.
2. Deeper engagement with national, regional, and global issues and stakeholders.
3. Better preparation of students as national and global citizens and as productive members of the workforce.
4. Access for students to programmes that are unavailable or scarce in their home countries.
5. Enhanced opportunities for academic staff improvement and, through mobility, decreased risk of academic ‘in-breeding’.

Source: International Association of Universities; (2012). Affirming Academic Values in Internationalization of Higher Education: A Call for Action
Wider benefits & Impacts

Benefits accrue to (i) SA (economy); (ii) international students themselves and (iii) students’ countries of origin:

A. Economic benefits to SA:
1. Additional HE exports – alumni recommend others to study in SA
2. Skilled migration – alumni work in highly skilled occupations in SA.
3. Enriches the experience of domestic students.

B. Benefits to international students:
1. Career enhancement or change.
2. Social benefits and networks.
3. Opportunity to develop marketable skills (e.g. inter-cultural competence; global awareness; foreign language skills, etc.).

C. Benefits to countries of origin:
1. Join highly skilled workforce in home countries.
2. Personal multiplier effects.

### Internationalization – key questions

1. 7.5% of our student enrolment is international students.

2. Other HE systems have between 15% to 30% international students.

3. **What should be the appropriate balance between local and international students in South Africa?**

4. South Africa should have a **discussion on** an appropriate balance between local and international students because:
   - Some students are full-fee paying students (particularly post-graduate students) with scholarships;
   - Universities could use these students’ bursaries and scholarships to augment their income; and
   - The more international students we have - a possibility exists for us to exploit the brand value of SA as a destination for international students.
Constraints

1. Size of our Higher Education system – access pressures for local students.

2. Policy and regulatory environment
   a. Joint and double degree policy still being developed
   b. Immigration regulations not favourable to internationalisation
   c. Insufficient scholarships for out-bound mobility of students
   d. Insufficient funding to foster joint research collaboration

3. Absence of a broader internationalisation policy framework for the university sector.

4. Inadequate coordination mechanisms between government departments (DHET, DST; DIRCO, DHA) to support internationalisation efforts of universities.
Proposed Solutions

1. Improve the policy and regulatory environment:
   a. Joint and double degree policy finalised and implemented
   b. Immigration regulations reviewed

3. Internationalisation policy framework for the university sector finalised and implemented.

4. Scholarship and other funding instruments established to support both in-bound and out-bound mobility of students.

5. Diverse funding instruments for joint research collaboration.

6. Coordination mechanisms between DHET and DST strengthened to support internationalisation efforts of universities.
RESEARCH AND POST-GRADUATE EDUCATION
Why is research important?

1. Economic inclusion and social development
2. Research from universities solves national development challenges:
   a. Water related challenges; improve waste and water management (Stellenbosch Water Institute & RU)
   b. Energy related challenges (CPUT)
   c. Rural and agricultural development, food security and land reform (UP, UWC, Univen and DUT)
   d. Health related challenges (malaria, TB and lifestyle diseases) – few research chairs in with a strong focus on diagnostics and drug discovering (UKZN)
   e. Differential patterns of urbanisation (African Centres for the Cities, UCT)
Highlights

1. SA produces the bulk of scientific research in Africa.

2. The number of post-graduate students grew from 70 964 in 1995 to 149 027 in 2012.


4. The SA system produced over 1870 doctoral graduates per year in 2013 from 1423 graduates in 2010.

5. Our university system has 157 NRF-funded research chairs – supporting research in areas of vital importance to South Africa.

6. Our system has 14 NRF-funded centres of excellence, which provide high-end skills development in priority research areas.


Units awarded

Year

2008 2009 2010 2011 2012

Journals
Conferences
Books

7638.2 8256.6 8603.4 9890.9 11035.7
Research funding

1. Decline in funding for research and innovation is noticeable.

2. Total approved research outputs for 2012 has increased to 12,363 units:
   - 2012 (10.5% growth)
   - 2011 (26.8% growth)

3. As universities increase their research output units (articles, books, conference proceedings, etc.); the total share to institutions also decreases.

4. Doctoral graduate output have increased from 1400 to just over 1800 with similar funding effect.

5. Research infrastructure funding (equipment, libraries, etc.) does not match the current demand.
Doctoral enrolments by race, 1996 to 2012


<table>
<thead>
<tr>
<th>Year</th>
<th>African</th>
<th>Coloured</th>
<th>Indian</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>265</td>
<td>197</td>
<td>681</td>
<td>4009</td>
</tr>
<tr>
<td>2000</td>
<td>451</td>
<td>334</td>
<td>1588</td>
<td>3981</td>
</tr>
<tr>
<td>2004</td>
<td>768</td>
<td>529</td>
<td>2946</td>
<td>4861</td>
</tr>
<tr>
<td>2008</td>
<td>774</td>
<td>575</td>
<td>4077</td>
<td>4568</td>
</tr>
<tr>
<td>2012</td>
<td>1085</td>
<td>811</td>
<td>5354</td>
<td>6714</td>
</tr>
</tbody>
</table>
% increase in doctoral enrolments by race group and gender, 2012 vs 1996

Progress of the 2006 new doctoral entrants after 7 years by race, gender & nationality
(Source: DHET & CHE Cohort Analysis (2014))

<table>
<thead>
<tr>
<th>Race</th>
<th>% Graduated</th>
<th>% Dropped Out or Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>46%</td>
<td>54%</td>
</tr>
<tr>
<td>White</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Indian</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Coloured</td>
<td>41%</td>
<td>59%</td>
</tr>
<tr>
<td>African</td>
<td>39%</td>
<td>61%</td>
</tr>
<tr>
<td>Male</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Female</td>
<td>46%</td>
<td>54%</td>
</tr>
<tr>
<td>Internatio..</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>National</td>
<td>45%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Source: DHET & CHE, Cohort analyses, 2014
Doctoral graduates according to nationality as % of total doctoral graduates, 2012
(Source: DHET (2013 HEMIS)
## PhD production in SA vs a number of selected OECD countries, 2000 and 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Average annual growth rate in total PhDs 2000 - 2011</th>
<th>Population 2011</th>
<th>2011 SET PhD graduates per 100,000 of 2011 population</th>
<th>2011 total PhD graduates per 100,000 of 2011 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>4.7%</td>
<td>22 324 000</td>
<td>15.9</td>
<td>27.2</td>
</tr>
<tr>
<td>Canada</td>
<td>3.3%</td>
<td>34 483 980</td>
<td>10.3</td>
<td>16.5</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>9.6%</td>
<td>10 496 670</td>
<td>14.5</td>
<td>23.5</td>
</tr>
<tr>
<td>Finland</td>
<td>-0.2%</td>
<td>5 388 272</td>
<td>21.1</td>
<td>34.4</td>
</tr>
<tr>
<td>Germany</td>
<td>0.5%</td>
<td>81 797 670</td>
<td>24.2</td>
<td>33.4</td>
</tr>
<tr>
<td>Hungary</td>
<td>5.1%</td>
<td>9 971 726</td>
<td>6.5</td>
<td>12.4</td>
</tr>
<tr>
<td>Ireland</td>
<td>10.1%</td>
<td>4 576 748</td>
<td>20.3</td>
<td>31.6</td>
</tr>
<tr>
<td>Italy</td>
<td>11.1%</td>
<td>60 723 570</td>
<td>11.8</td>
<td>18.6</td>
</tr>
<tr>
<td>Korea</td>
<td>6.0%</td>
<td>49 779 440</td>
<td>14.0</td>
<td>23.4</td>
</tr>
<tr>
<td>Norway</td>
<td>6.4%</td>
<td>4 953 000</td>
<td>16.7</td>
<td>26.2</td>
</tr>
<tr>
<td>Portugal</td>
<td>3.5%</td>
<td>10 557 560</td>
<td>11.4</td>
<td>21.9</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>12.8%</td>
<td>5 398 384</td>
<td>16.1</td>
<td>31.0</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2.2%</td>
<td>7 912 398</td>
<td>30.1</td>
<td>44.0</td>
</tr>
<tr>
<td>Turkey</td>
<td>7.4%</td>
<td>73 950 000</td>
<td>3.5</td>
<td>6.3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5.1%</td>
<td>61 761 000</td>
<td>19.5</td>
<td>32.5</td>
</tr>
<tr>
<td>United States</td>
<td>4.5%</td>
<td>311 591 900</td>
<td>13.0</td>
<td>23.4</td>
</tr>
<tr>
<td>South Africa</td>
<td>4.5%</td>
<td>51 770 560</td>
<td>1.6</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Source: OECD (2013) Graduates by field of study, data extracted on 4 July 2013.
Research output of academic staff

Source: DHET (2013). HEMIS

- Permanent academic staff
- Perm academic staff with doctorates
- Research Publications

Year | Permanent Academic Staff | Perm Academic Staff with Doctorates | Research Publications
---|--------------------------|------------------------------------|--------------------
2000 | 14,184                   | 4,561                              | 5,602              
2004 | 15,423                   | 4,485                              | 6,660              
2008 | 15,936                   | 5,403                              | 8,070              
2012 | 17,452                   |                                    | 12,367             

Constraints

1. Post-graduate student enrolment and outputs remain low relative to national developments needs.

2. 36% of our academic workforce hold a doctorate.

3. Research performance of universities is uneven - 10 universities producing 86% of all research and 89% of doctoral graduates.

4. Blockages in undergraduate and post-graduate pipeline.

5. Post-graduate supervision capacities are limited.

6. Research and post-graduate education funding is inadequate.

7. Transforming the social composition of the academic workforce (black and women).

8. Challenges relating to producing and retaining the next generation of academics.
Differentiation

1. The sector should comprise a continuum of institutions, ranging from specialized, research-intensive universities to largely undergraduate institutions, with various levels of research focus and various postgraduate niches at masters and/or doctoral level.

2. It vital that the core functions of our universities are supported by government through a differentiated approach and strategy that:
   - Gives scope to the different missions, programmes and capabilities of our universities; and
   - Recognises and builds on the distinctive strengths and achievements of all universities within their strategic and specific locational trajectories of development.
Proposed Solutions

1. Develop and implement a national, state-funded programme for the next generation of academics to:
   a. Increase the proportion of academics with a doctoral qualification;
   b. Increase the proportion of black and women academics;
   c. Increase the proportion of African academics.

2. Create diverse funding instruments to support and retain post-graduate students (Honours, Masters and Doctoral).

3. HESA and the State should finalise and implement a differentiation policy, giving each institution a “clearly defined mandate”.

4. Increase HE funding allocation as a % of government budget and of GDP – in line with the projected student enrolment growth.

5. Strengthen university-business collaboration.

6. National digital library for universities established
CONCLUSION

1. Internationalisation is important for the health of our HE system.

2. Despite the gains made since 1994; much more still needs to be done to create an enabling environment to support internationalization.

3. The research and innovation performance of our system requires catalytic interventions:
   a. A state-funded national programme for building the next generation of academics and address transformation challenges; and
   b. Implementation of a differentiation policy framework.

4. Adequately fund the HE system in line with its projected student enrolment growth.
Thank you