

time.zip



Human Resources for Research and Innovation

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3 March 2008

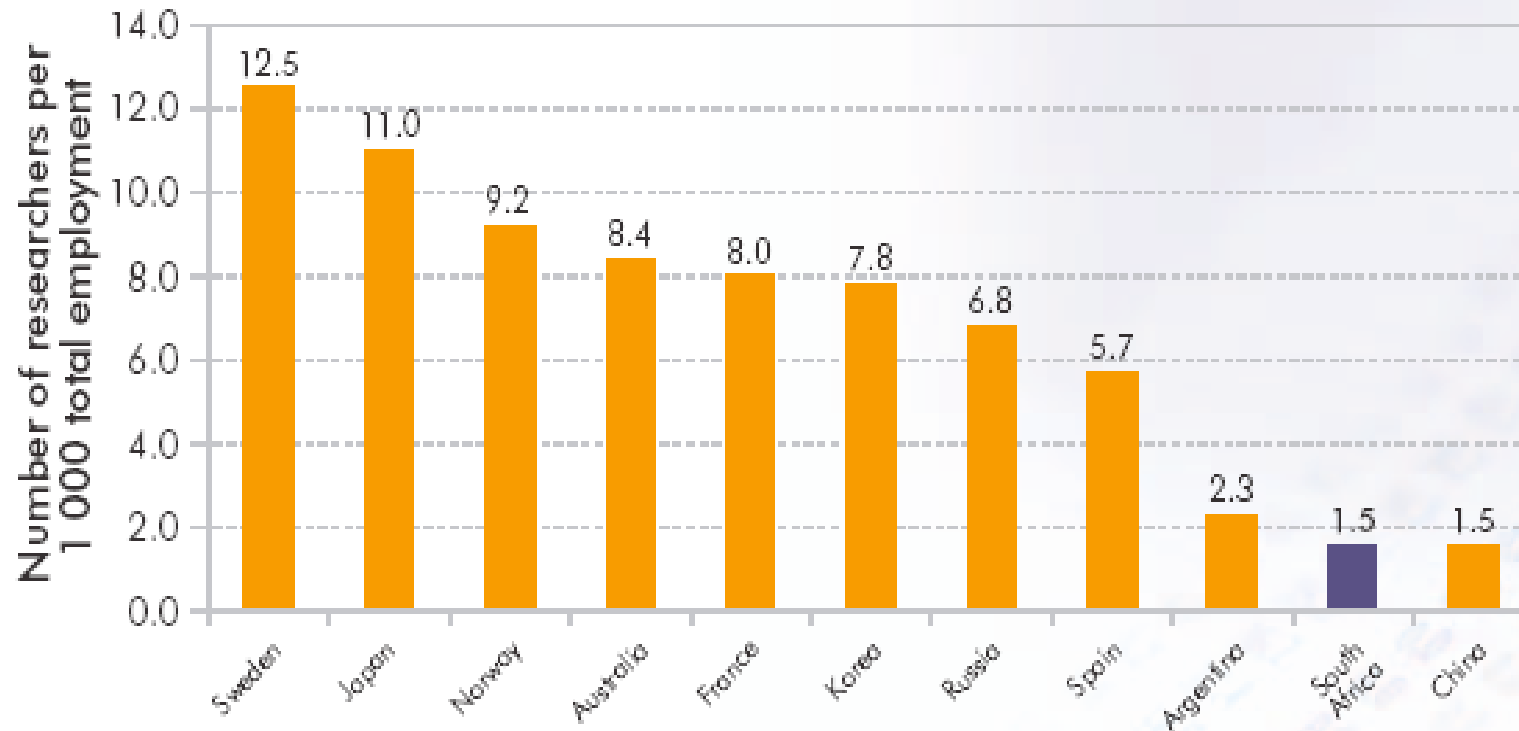
Scoping the problem....

- Too few engineers, scientists, artisans and technicians
- Those that we have are not productive enough
- Our national culture partly stands in the way of us solving the problem

Numbers of researchers

FIGURE 4:

Number of Full-time Equivalent (FTE) researchers per 1 000 total employment in 2005
(International comparison)

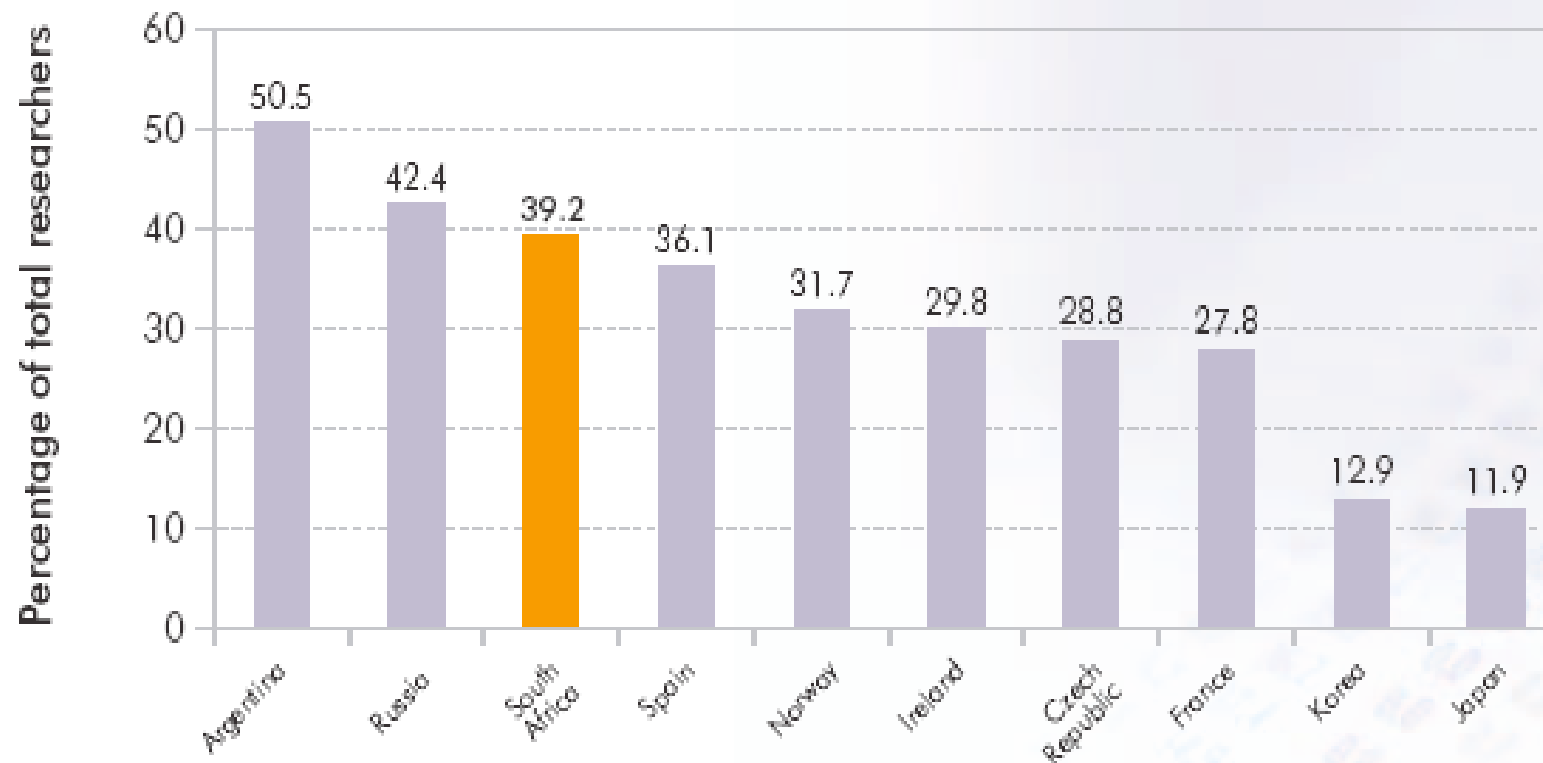


Gender...

FIGURE 5:

Women researchers as a percentage of total researchers (headcount) 2005

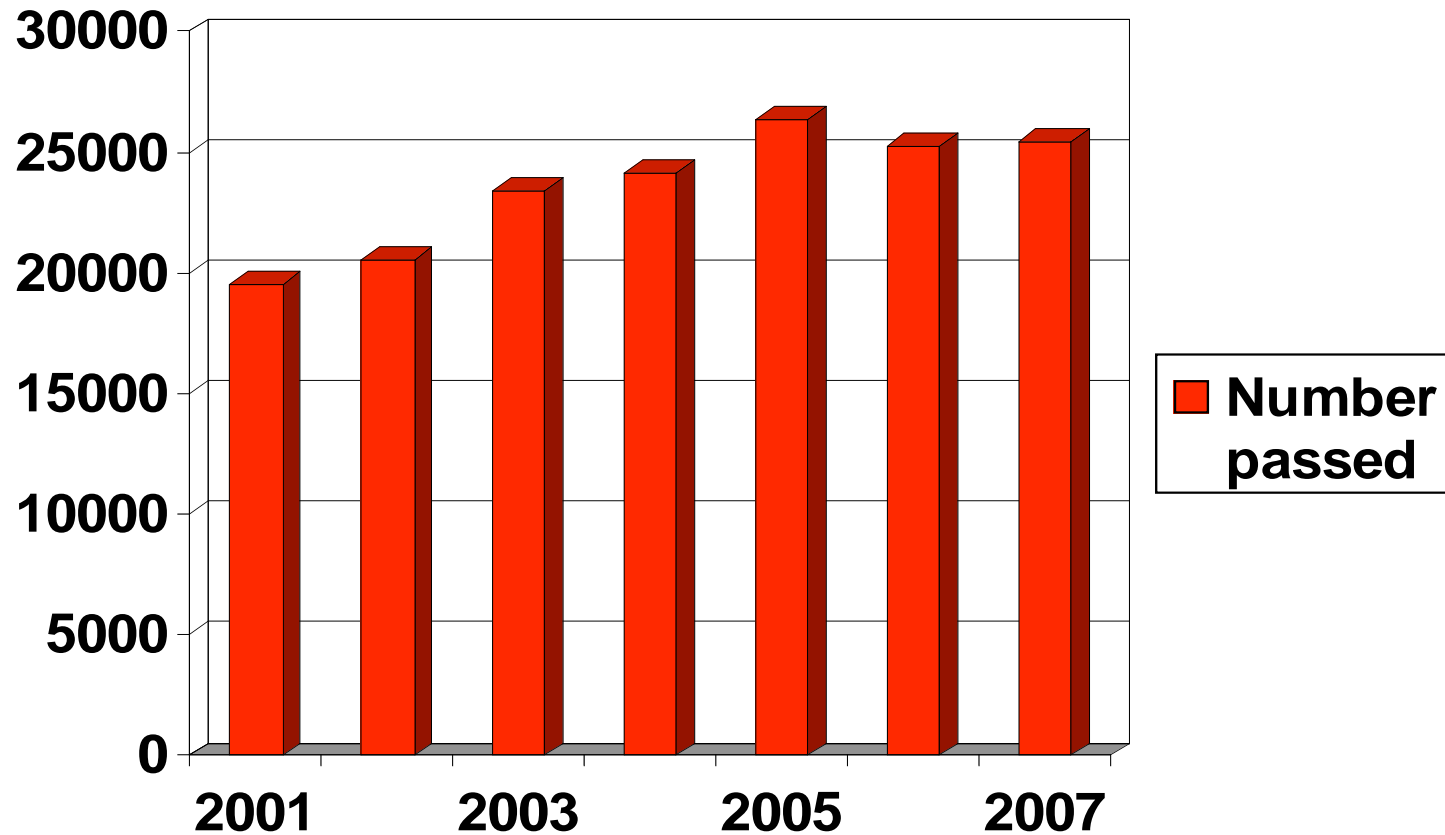
(International comparison)



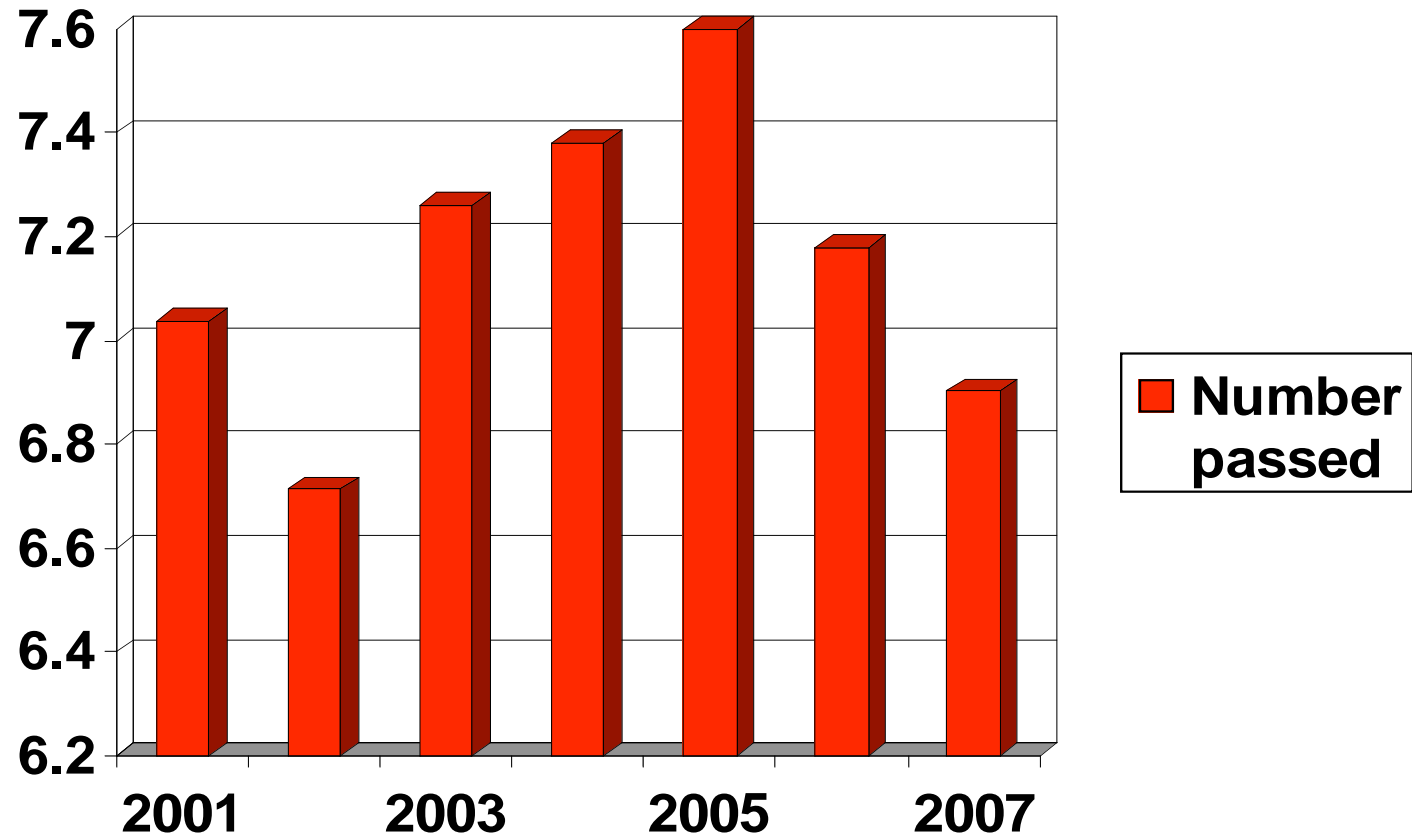
Engineers in the workforce

| Engineering International Data | | | |
|--------------------------------|--|-----------------------|------|
| Engineers | | Workforce Per 1000 | Year |
| Finland | | 11 | 1993 |
| Sweden | | 25 | 1990 |
| South Korea | | 4 | 1990 |
| Britain | | 14 | 1991 |
| Canada | | 4 | 1991 |
| Singapore | | 9 | 1990 |
| Japan | | 24 | 1990 |
| Australia | | 5 | 1991 |
| United States | | 15 | 1990 |
| Brazil | | | |
| Malaysia | | | |
| Chile | | | |
| Other | | | |
| South Africa | | 2 | 1990 |
| South Africa | | 2 | 2002 |

Number of matriculants passing HG mathematics

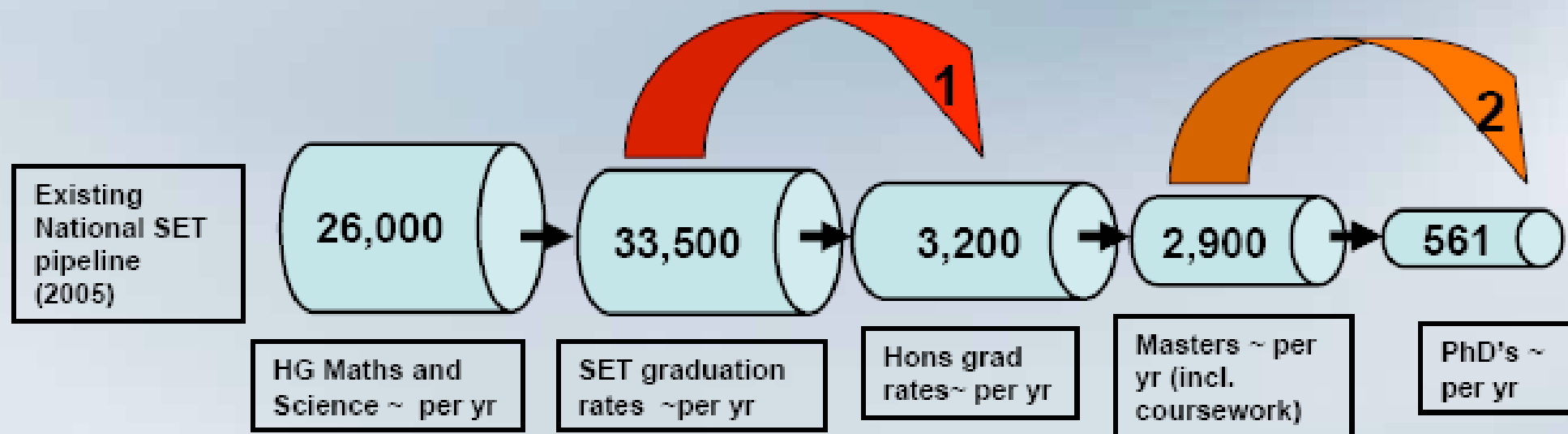


Percentage of matriculants passing HG mathematics

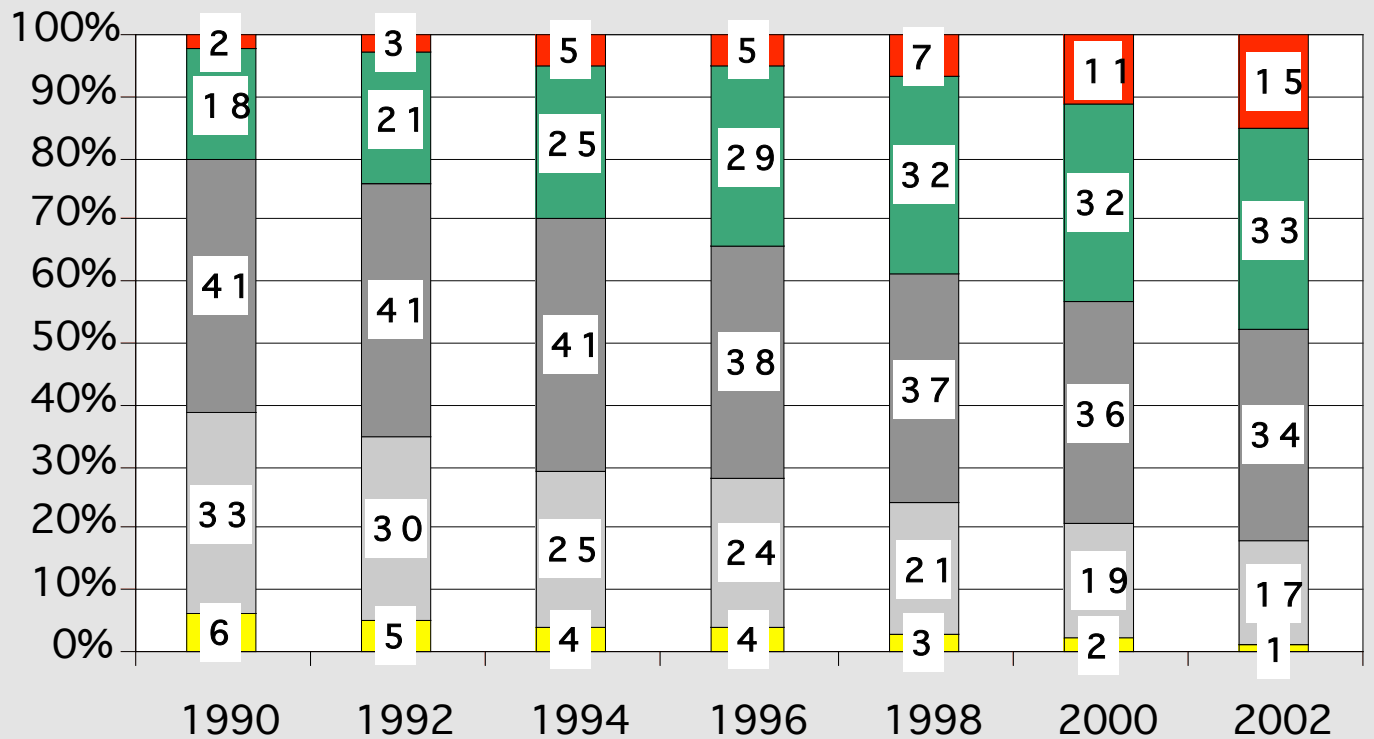


The Research Graduate “Pipeline”.

1. < 10% proceed from a basic degree to pursue honours
2. Only 19% proceed from Masters to Doctoral studies



Ageing of the Productive Research Population



■ Under 30 ■ 30 - 39 ■ 40 - 49 ■ 50 - 59 ■ 60+

Age distribution of R&D workers

| All R&D Personnel | <i>Age Categories</i> | | | | | |
|---|-----------------------|--------------|--------------|--------------|--------------|----------------|
| | <i>< 25</i> | <i>25-34</i> | <i>35-44</i> | <i>45-54</i> | <i>55-64</i> | <i>> 64</i> |
| Researchers | 3.5% | 28.1% | 32.1% | 22.8% | 11.6% | 2.0% |
| Technicians directly supporting R&D | 8.5% | 33.2% | 31.0% | 19.6% | 7.3% | 0.4% |
| Other personnel directly supporting R&D | 4.1% | 21.8% | 32.6% | 28.0% | 12.0% | 1.6% |
| Total (100% in row) | 4.8% | 27.2% | 32.0% | 23.8% | 10.8% | 1.5% |

Eskom new build as an example

Current Portfolio Plan

- **By 2025 Eskom aspires to the following portfolio of Generation Assets – totaling over 80 000MW of capacity:**
 - **Additional nuclear capacity of up to 20,000 MW**
 - **Additional renewable energy capacity of at least 1,600 MW**
 - **Additional imports to a maximum of the prevailing reserve margin (15%)**
 - **Additional pumped storage as required**
 - **Additional 4000MW of OCGT (including IPPs)**
 - **Additional cleaner coal capacity (Carbon Capture and Storage ready) limited beyond 2015 to decrease the coal proportion from 86% to below 70% by 2025**

Peak skill requirements

- 2000 engineers
- 500 scientists
- 2100 artisans
- 2200 semi-skilled
- 1300 non-production
- 7000 unskilled

Where will they come from?

UAE approach to skills...



Bring in foreign experts in their thousands but restrict their rights..

Necessary interventions

- **All hands on deck, the Department of Education can't do everything. We have to generate our own sector-specific solutions.**
- **De-stigmatize elitism. Generalize the Protec approach at school level to double the flow of HG Mathematics passes.**

Necessary interventions

- **“Madala” battalion. We need to find creative ways for the “Silent Generation” to transfer knowledge to “Generation X”.**
- **Accept and embrace globalization. We need to consider the UAE model, even though it seems contrary to our culture.**
- **Promote research productivity. We need to find ways to retain good people in research.**

Thank you!