

**MATH SCHOOLS ARE NOT
EQUAL: STATE OF MATH AND
SCIENCE EDUCATION**

Tracking development progress

Vijay Reddy

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Framework to track development progress

- Many ways to track development.
- State of the Nation address (2005):
“how many young black people are matriculating with exemptions in mathematics and science”.

Where to start.....

Verwoerd (1953): what is the use of teaching the Bantu mathematics when he cannot use it in practice?

Framework for the presentation

Tracking development along 4 themes:

- 1. Politics/ political (brief)**
- 2. Policies and programmes (brief)**
- 3. Participation**
- 4. Performance**

1. The Political

- Pre 1994: Verwoerd and apartheid philosophy and legacy.
- Post 1994: government and political commitment starting from the President about math and science.
- The post 1994 political commitment has created pressure for results.

2. Policies and programmes

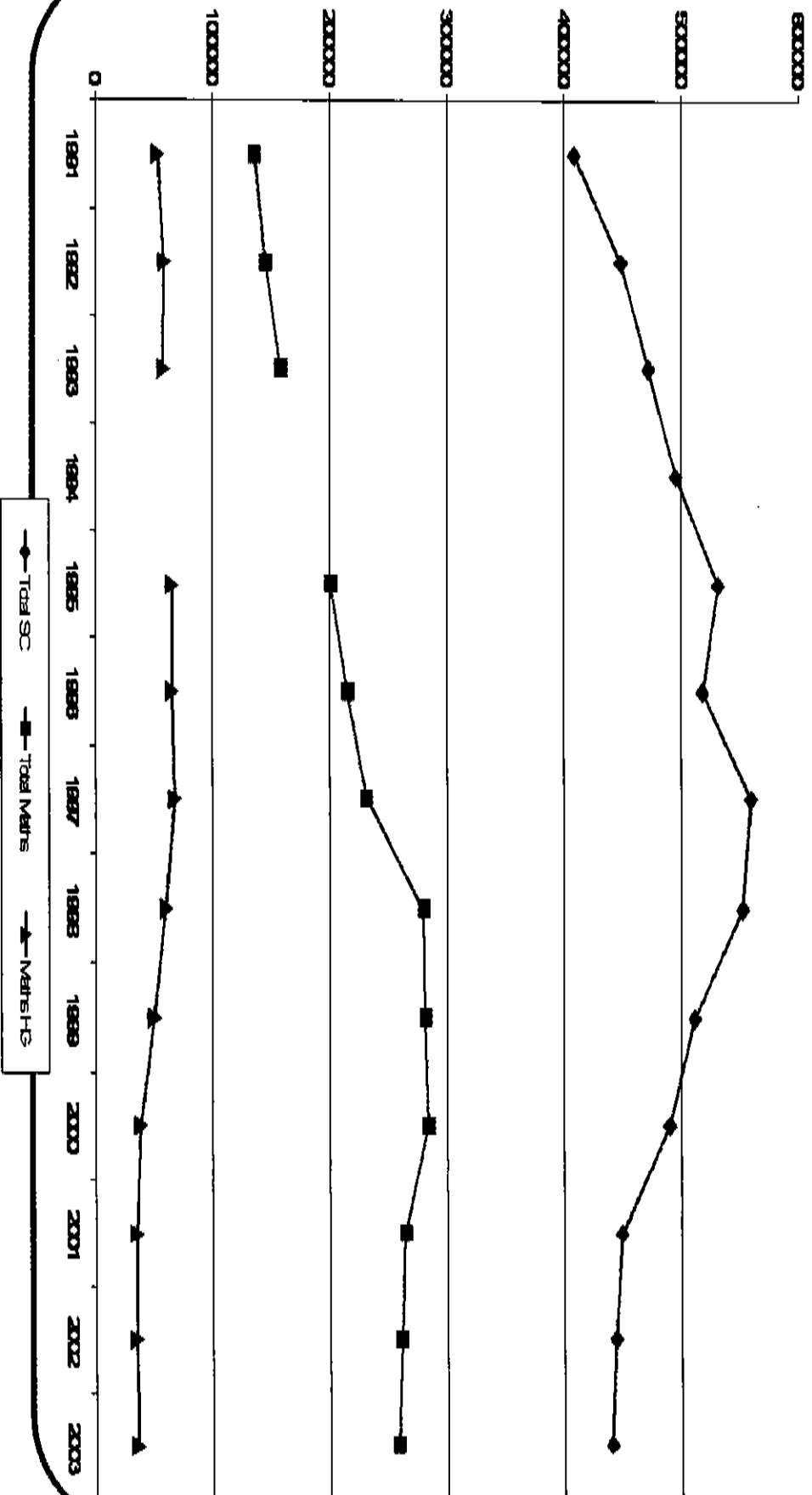
- Since 1994: policies of school integration, new curriculum etc.
- Government programmes to improve math and science – **SYSTEM**; National Strategy for Math and Science (incl Dinaledi schools).

3. Participation

Participation and Performance in Math by racial groups in 1990

	Participation rate in matric math	% HG math participation	Pass rate in math
White	64	60	97
Indian	70	74	76
Coloured	45	38	74
African	24	65	15

Change in participation (91-03)



4. Performance

- Gr 3 national evaluation[2001]: numeracy = 30%.
- Gr 6 national evaluation [2004] –numeracy = low
- TIMSS gr. 8 [2002] - SA came last of 50 countries.
- Matric Math [2002]: 19 765 HG passes

Textured analysis of performance

- **Case 1: TIMSS**
- **Case 2: Matric Math performance**
- **Case 3: 6- year trend analysis of matric math performance**

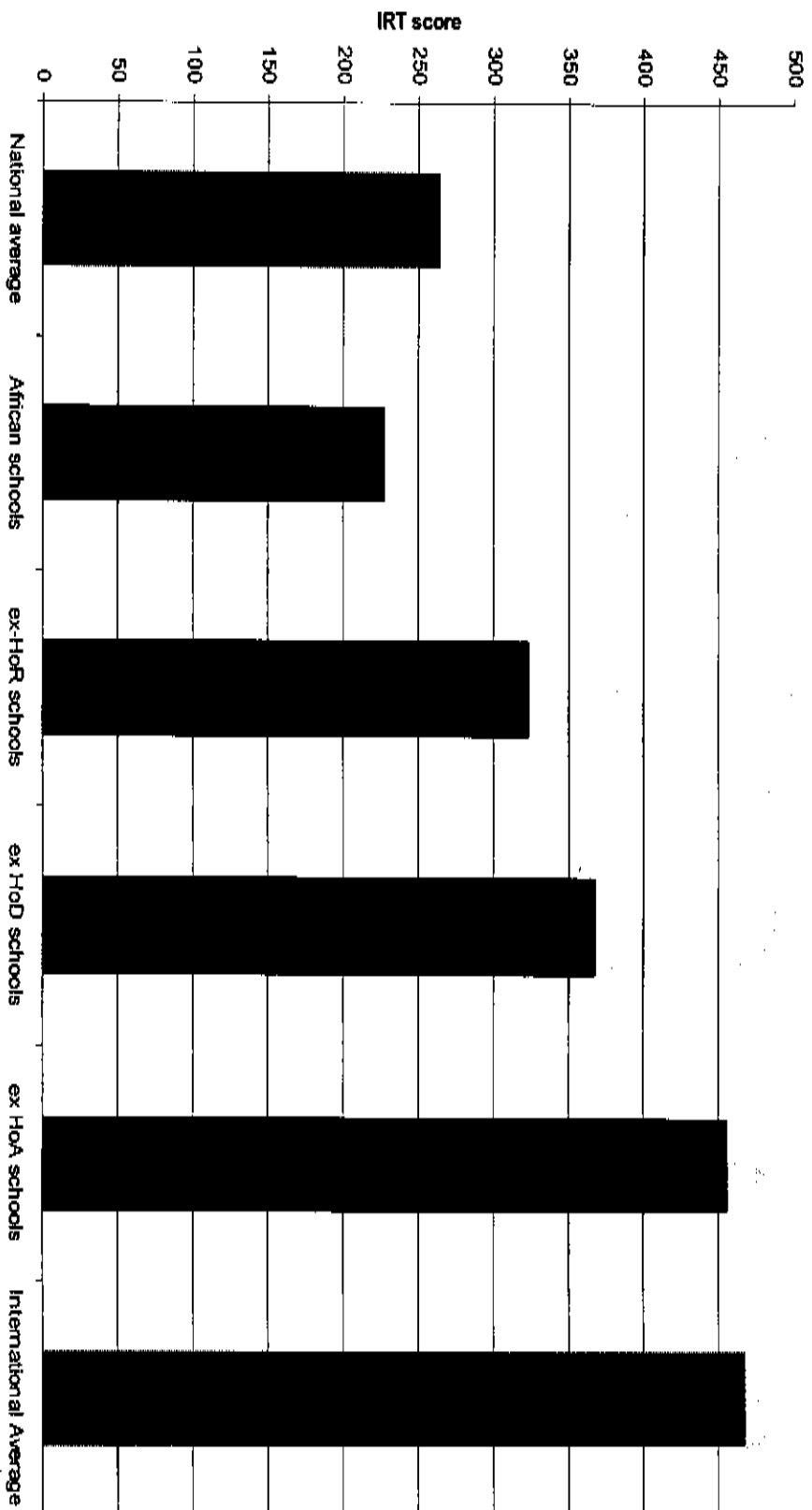
Distribution of Mathematics Achievement

Mathematics Achievement Distribution

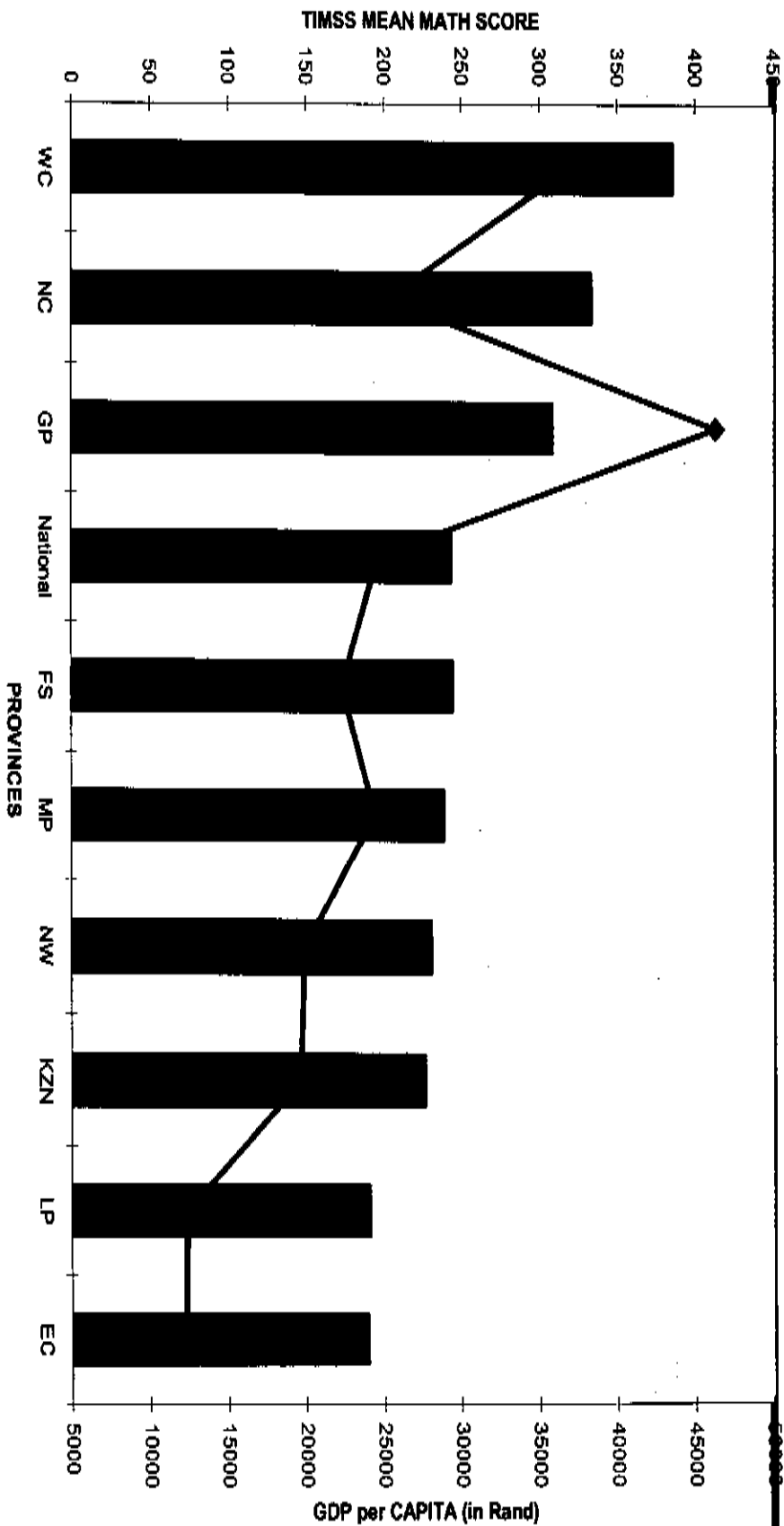
Country	Score	Standard Deviation
Singapore	605	(3.6)
2 Korea, Rep. of	589	(2.2)
† Hong Kong, SAR	586	(3.3)
Chinese Taipei	585	(4.6)
Japan	570	(2.0)
Belgium (Flemish)	537	(2.8)
† Netherlands	536	(5.8)
Estonia	531	(3.0)
Hungary	529	(3.2)
Malaysia	508	(4.1)
Latvia	508	(3.2)
Russian Federation	508	(3.7)
Slovak Republic	508	(3.3)
Australia	505	(4.6)
† United States	504	(3.3)
Lithuania	502	(2.5)
Sweden	499	(2.6)
† Scotland	498	(3.7)
Israel	496	(3.4)
New Zealand	494	(5.3)
Slovenia	493	(2.3)
Italy	484	(3.2)
Azerbaijan	478	(3.0)
Serbia	477	(2.6)
Bulgaria	476	(4.3)
Romania	475	(4.8)
† Independent Variable	461	(2.5)
Norway	460	(4.0)
Moldova, Rep. of	459	(1.7)
Cyprus	435	(3.5)
Macedonia, Rep. of	433	(3.1)
Lebanon	424	(4.1)
Jordan	411	(2.4)
Iran, Islamic Rep. of	411	(4.8)
Indonesia	410	(2.2)
Tunisia	406	(3.5)
EGYPT	401	(1.7)
Bahrain	390	(3.1)
Palestinian Nat'l Auth	387	(3.3)
Chile	387	(2.5)
† Morocco	378	(5.2)
Philippines	366	(2.6)
Bosnia	332	(4.6)
Saudi Arabia	276	(4.7)
Qatar	264	(5.5)
South Africa	498	(4.7)
† England	487	(3.7)
Benchmarking Participants	508	(2.2)
Basque Country, Spain	521	(3.5)
† Minnesota State, US	543	(3.0)
Ontario Province, Can		
Quebec Province, Can		

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PERFORMANCE BY FORMER RACIAL CATEGORISATION OF SCHOOLS



MEAN PROVINCIAL SCORES and GDP per CAPITA



Case 2: Matric math performance

- In 2002: 19 765 HG math passes from public sch
- Of these 4637 (23%) were African learner

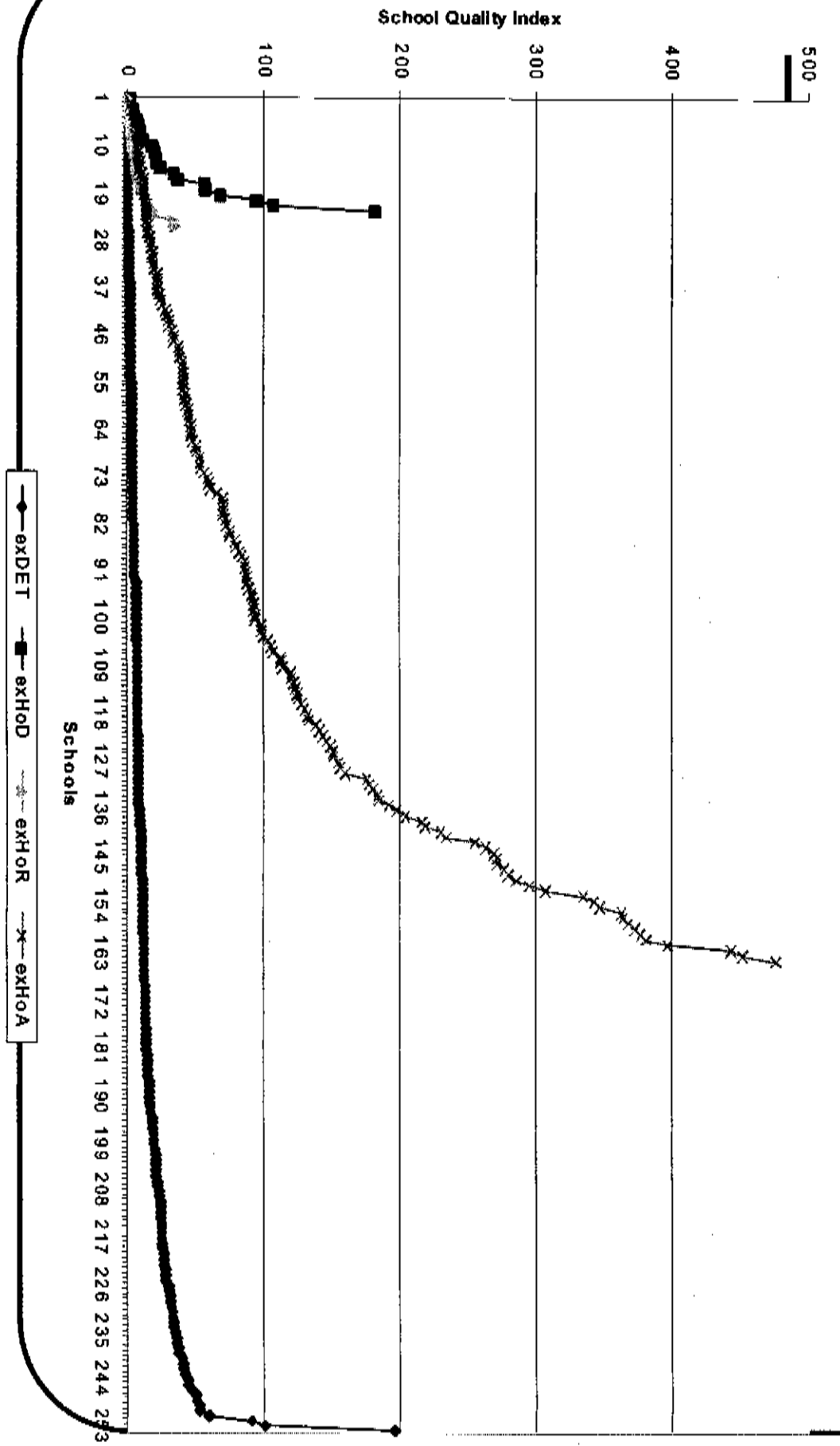
Passes were distributed in the ffg manner:

- 2889 from DET schools
- 1557 from ex HoA schools (there were 2265 African math HG candidates).

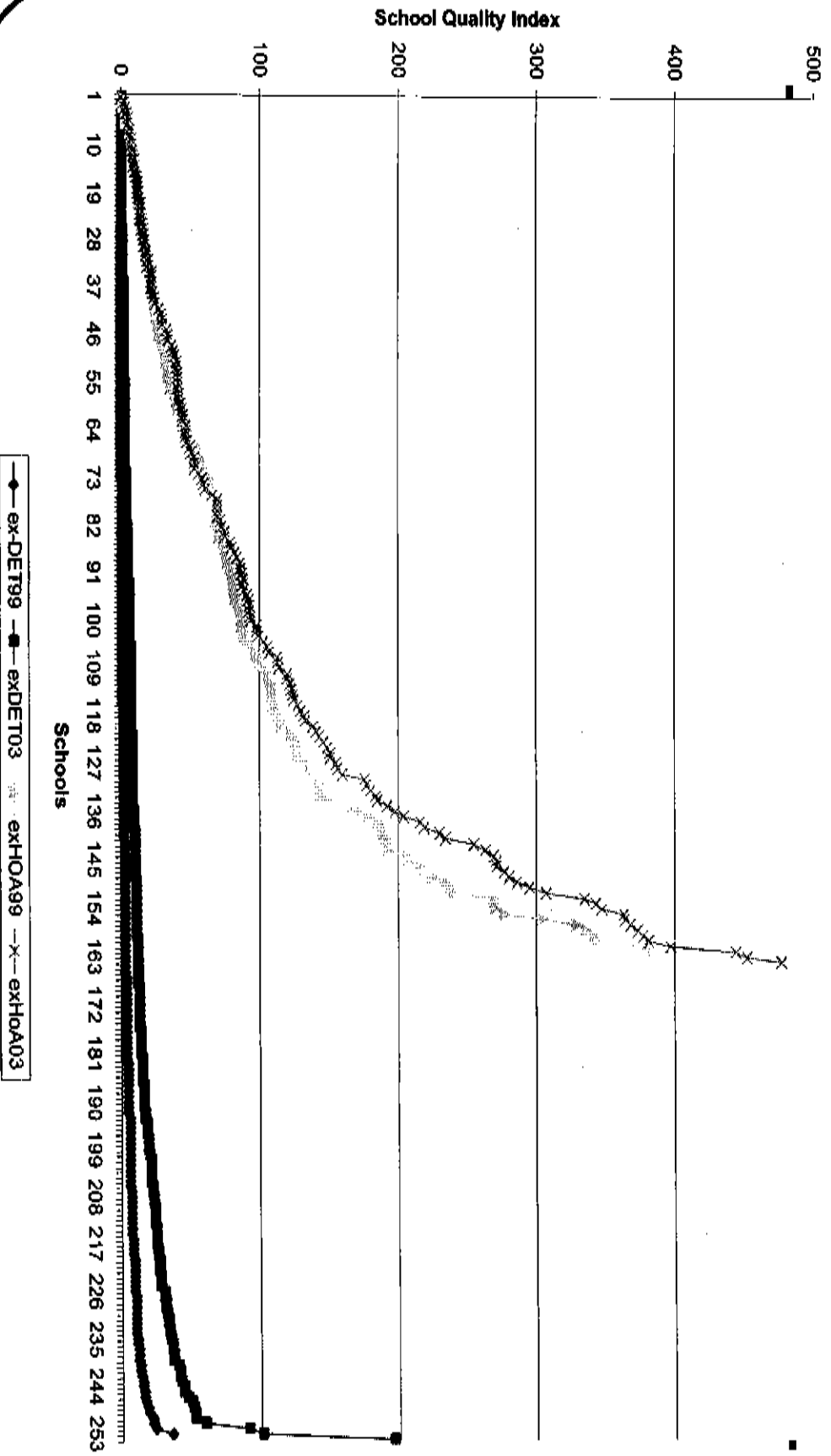
Case 3: 6- year trend analysis of matric math performance

- Make schools the unit of analysis
- In poverty, schools are important to provide quality experiences to learners.
Schooling can be a leverage for change
- Use the Gauteng case study

SCHOOL QUALITY BY EX-DEPT FOR 2003



Change in school quality over time (98-03)



Racial integration in schools in Gauteng (2002)

- EX-HoR schools had 44% African and 56% Coloured learners,
- EX HoD schools there were 63% African and 31% Indian learners,
- EX HoA schools there were 5% Coloured, 3% Indian, 34% African and 57% White learners.

What progress?

Political commitment there, but the politics of showing results (magic bullet) could have a counter effect on quality.

Policies and programmes: great policies but not enough on implementation and time to embed innovation.

Lack of evaluation -we become 'serial innovators'.

3. Participation

Math participation increased, and not concomitant resources and support.

There is a drop in quality.

Concern is that absolute numbers are decreasing.

From 2006 math literacy (math for all) what will be introduced. What happens to quality

4. Performance

- School performance different for schools of ex racial depts.
- Some improvement over time but the gap remains the same.
- Learner with more resources will access schools that have had the historic advantages.
- The African schools have to now deal with historical legacies and migration of better resourced and better performing learners.
- The challenge is how these schools can provide opportunities for learners to break the cycle

So in conclusion

In tracking future development progress it might be better if the President asked the question:

“how many black learners, from African schools, graduate with exemptions in math and science.