IRC-2015, Cape Town, South Africa

What do /can the IEA studies mean for developing countries education systems and educational research?

Sarah Howie (PhD)

6th IEA International Research Conference

Keynote Address: 26 June 2015

Dedications

Constantinos Papanastasiou

Tjeerd Plomp

Acknowledgements

IEA colleagues

CEA team

Karen, Nangamso and Thembi

Overview

- Emergence of IEA studies within a global context
- Developing countries' participation in IEA studies
- Some key findings and significance for Africa
- Impact and meaning for South Africa?

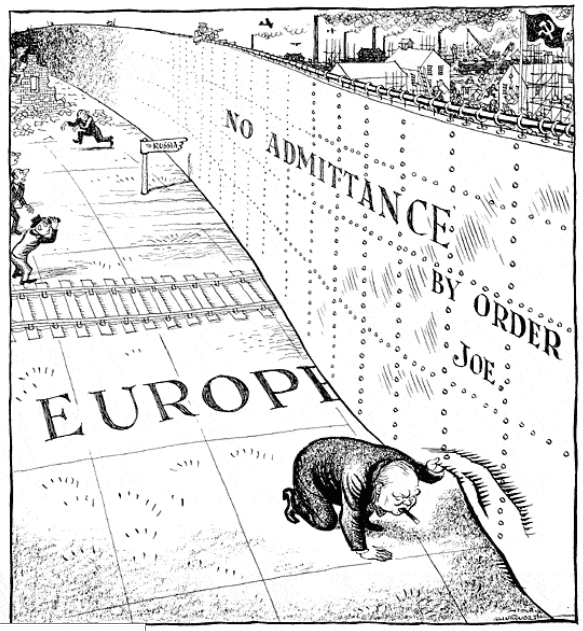
EMERGENCE OF IEA STUDIES WITHIN A GLOBAL CONTEXT

Global context: post WWII

THE WIND FROM THE WEST

"And now get down to it!"

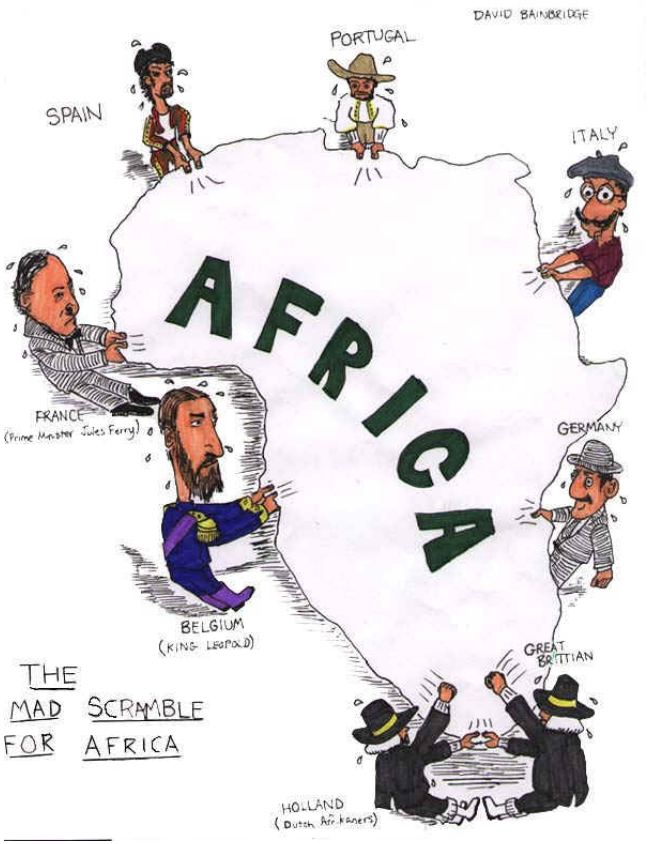
Rebuilding Europe Marshall Plan

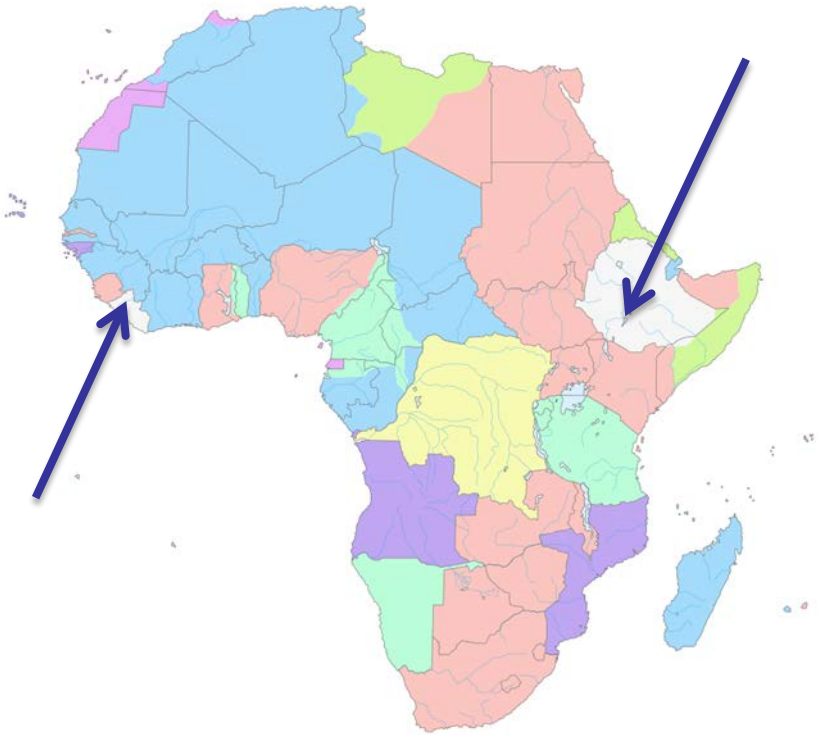


Iron Curtain

Conflict in Asia

Scramble for Africa





Establishment of IEA

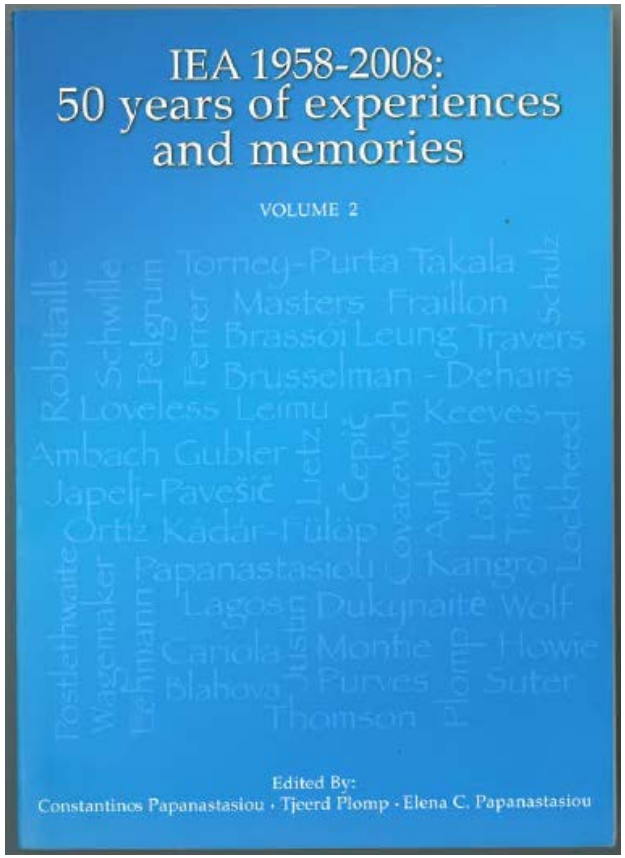
- Founded in 1958
- An independent, international cooperative of national research institutions and governmental research agencies.
- Mission: to conduct comparative research studies in education
- To date, conducted more than 30 international comparative research studies.

Establishment of IEA

Original intention

- World as laboratory
  (Keeves, 2011)
- Learn from other countries
- Exponential growth in 1990s
  - Increase in membership
  - Expansion of methods and types of studies
  - Organisational capacity and structure (Ambach, 2008)

Establishment of the IEA studies



- Initial researchers of IEA
  - Benjamin Bloom
  - Robert Thorndike
  - C. Arnold Anderson
  - Douglas Pidgeon
  - Gilbert Peaker
  - David Walker
  - Torsten Husen
  - Sven Hilding
  - Neville Postlethwaite

- Additional specialists on early studies included:
  - Ralph Tyler
  - John Tukey
  - Julian Stanley
  - James Coleman
  - John B. Carroll
  - Sten Henrysson
  - Herman Wold

Early Studies

Year and Study	Focus	Countries
1960 Pilot study	Educational achievement of 13-year-olds in twelve countries – report by Foshay, Thorndike et al (1962), Unesco Institute for Education Hamburg	12 countries
1964 Cross National Study of Mathematics	Mathematics 13 year-olds (report in 1967)	12 countries
1970-71 Six-subject Study	Science, Reading, Literature, French, English, Civics (14-year olds)	19 Countries (science) 8 countries (French)

Volunteerism and commitment

The motivation of the participants can be illustrated with the following anecdote about Robert Thorndike:

On one occasion Thorndike, who taught his classes on a Wednesday in New York, left the Eltham meeting on Tuesday evening, taught in New York on the Wednesday and flew back to London on Wednesday night – all paid for out of his own pocket.

(Plomp 2013, quoting Postlethwaite, 2009)

Raison D'etre of IEA studies

'If custom and law define what is educationally allowable within a nation, the educational systems beyond one's national boundaries suggest what is educationally possible. The field of comparative education exists to examine these possibilities'.

Foshay, Thorndike, Hotyat, Pidgeon & Walker, 1962

Purposes of International Comparative Studies

Howie and Plomp, 2006

Challenges for IEA studies

- Traditionally expertise lay in Western countries, especially in early studies.
- Further capacity had to be developed regionally amongst poorer nations within developing contexts to increase participation.
- More equal balance of the power relations was needed between individual countries participating between developed and developing countries.
- The emergence of the OECD studies was in response to the perceived needs of industrialised countries for information about educational indicators representing the economic perspective.
- Increased number of studies seemingly addressing similar areas within relatively short time periods.
- Maintaining the balance between the researchers' voice and that of the ministeries/policymakers.

Contribution of IEA studies to research, education and systems internationally

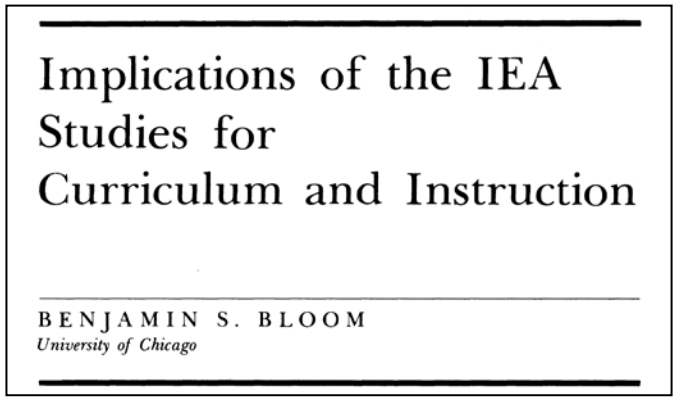
- Competence
- Cooperation
- Computers
- Other
- Considerable influence on education policy and practice
  - Relationships out of school variables-achievement
  - Gender differences

Richard Wolf, in Papanastastiou, Plomp, Panastasiou 2011, p.276-280

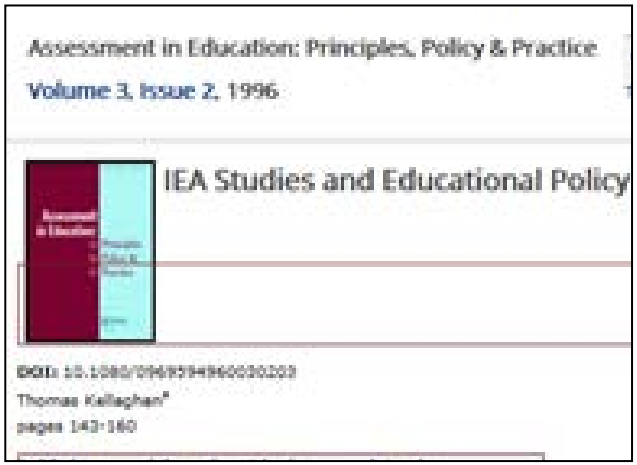
Contribution of IEA studies to research, education and systems internationally

Reflections on IEA contributions

- African countries,
- Australia,
- Chile,
- 18 developing countries (Elley)
- East Asia
- Germany
- Hungary
- Iran
- Latvia, Lithuania, Slovak republic, Slovenia
- USA


Implications of the IEA Studies for Curriculum and Instruction

BENJAMIN S. BLOOM
University of Chicago


Assessment in Education: Principles, Policy & Practice
Volume 3, Issue 2, 1996

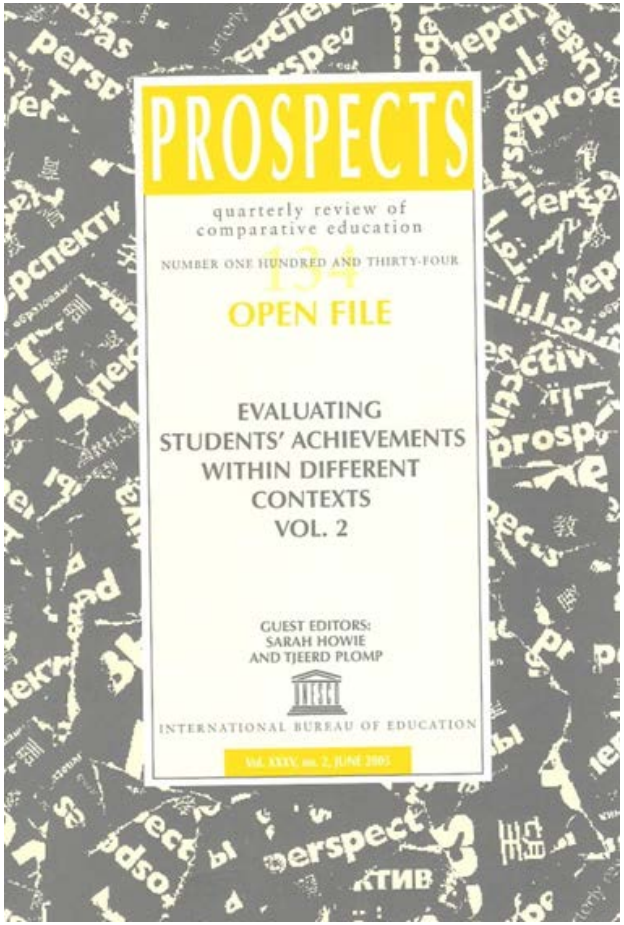
IEA Studies and Educational Policy

Thomas Kellaghan

Contribution of IEA studies to research, education and systems internationally

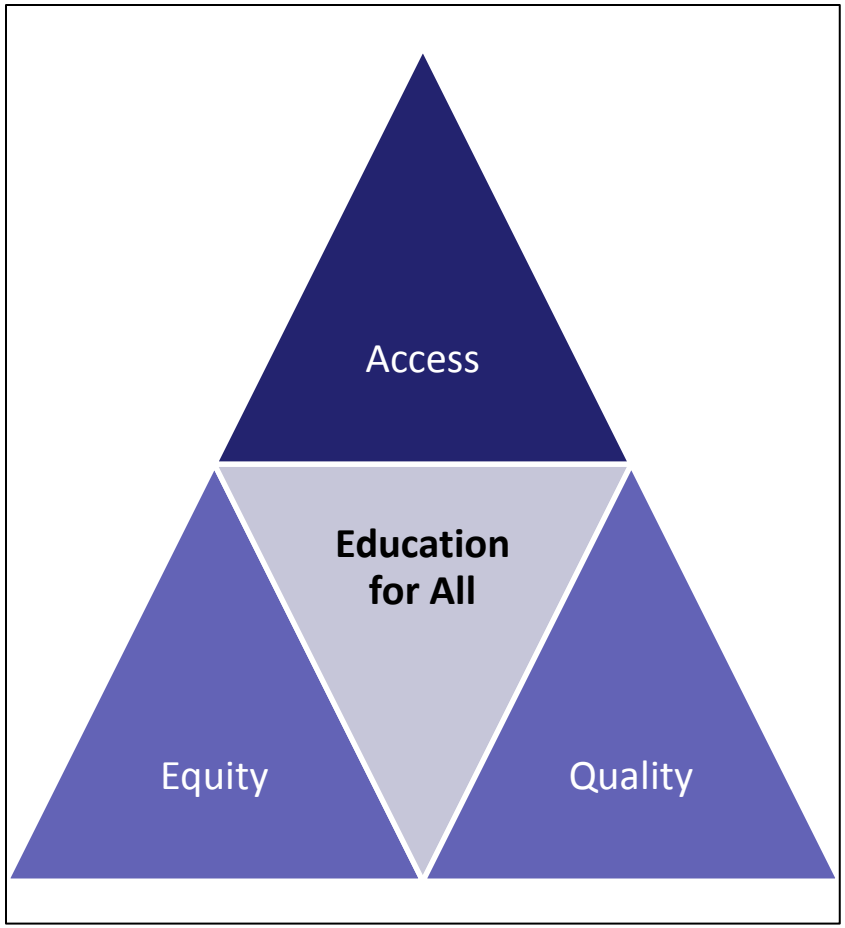
Reflections on contributions

- 18 developing countries (Elley, 2005)
  - Most new countries, number of Eastern Bloc
  - Research capacity development, curricula, national assessments, and in-service training
- Hungary (Brassoi & Kadar-Fulop, 2011)
  - Curriculum and textbook reforms 1980s and 1990s, but little direct impact until 2000s,
  - Objective testing and establishment of national assessments **major** impact of IEA
- Iran (Ali Reza Kiamanesh, 2005)
  - TIMSS 1999 was first reliable and valid data at the national or regional level to monitor education quality in Iran.
  - Kiamanesh's secondary analysis study filled gap in the research in this area in Iran
- Latvia, Lithuania, Slovakia, Slovenia (Pelgrum et al, 2011)
  - 1990s, divorce from Soviet Union, Czech Republic and Yugoslavia
  - Impact on educational policies and curriculum reform (use of external evaluation), educational research.

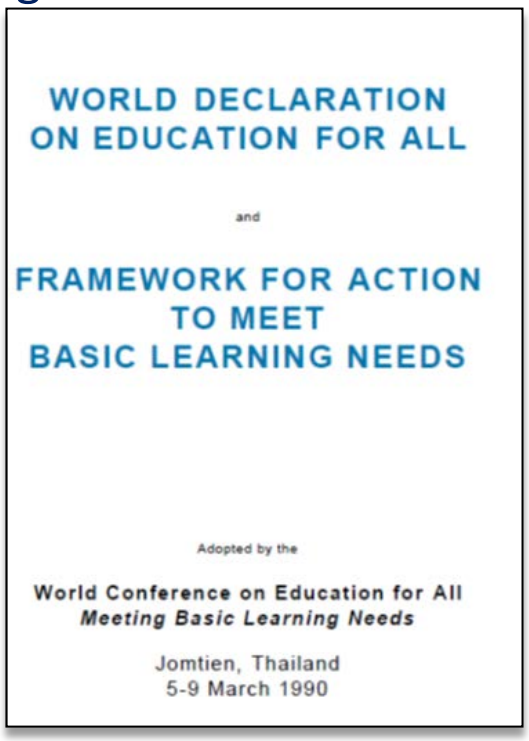


DEVELOPING COUNTRIES' PARTICIPATION IN IEA STUDIES

UNESCO and Education for All



The UNESCO conference in Jomtien defined the Education for All concept and its goals based on 3 tenets


WORLD DECLARATION ON EDUCATION FOR ALL

and

FRAMEWORK FOR ACTION TO MEET BASIC LEARNING NEEDS

Adopted by the

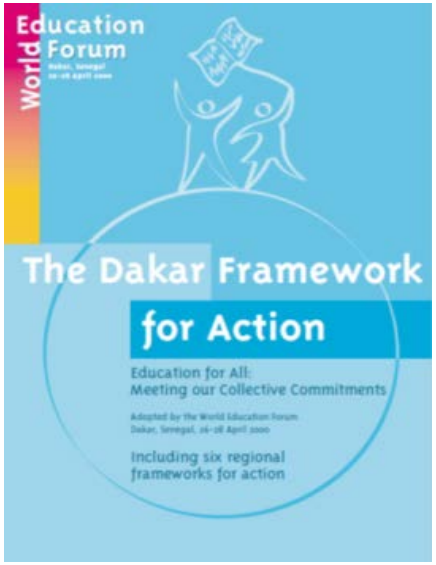
World Conference on Education for All
Meeting Basic Learning Needs

Jomtien, Thailand
5-9 March 1990

Dakar framework for Action 2000

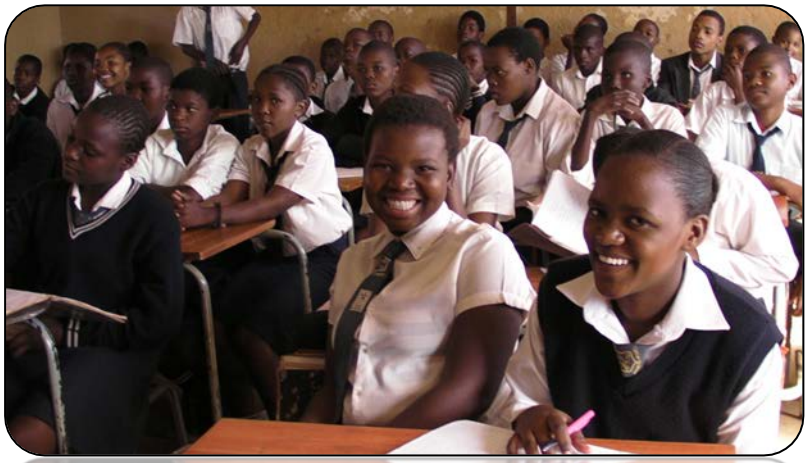
1. Expansion of early childhood care and education	2. Achievement of universal primary education
3. Development of learning opportunities for youth and adults	4. Spread of literacy
5. Gender parity and gender equality in education	6. Improvements in education quality

- 164 governments adopted a Framework for Action
- 6 Education for All goals



Goal 6:
How much are children learning?

Improving all aspects of the quality of education and ensuring excellence of all so that recognised and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills



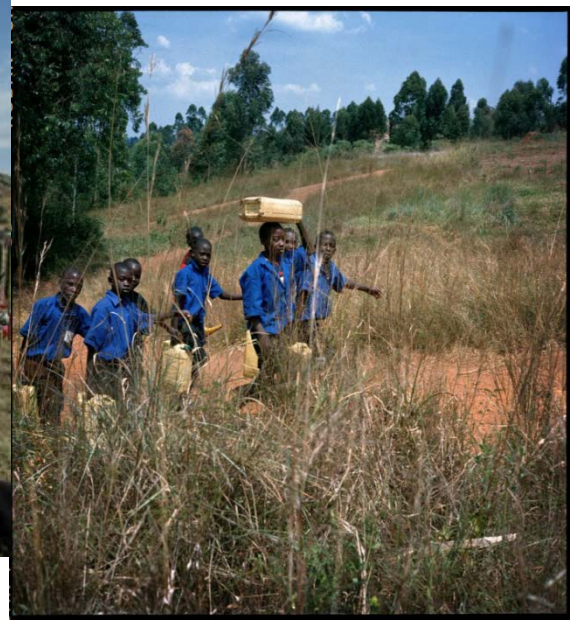
Global Monitoring Report, 2008

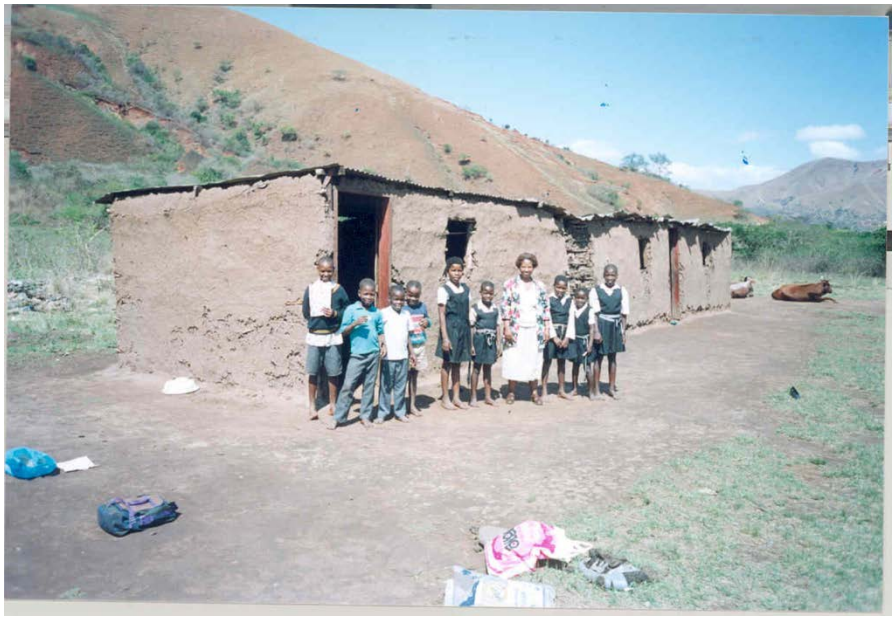
Current global context for education

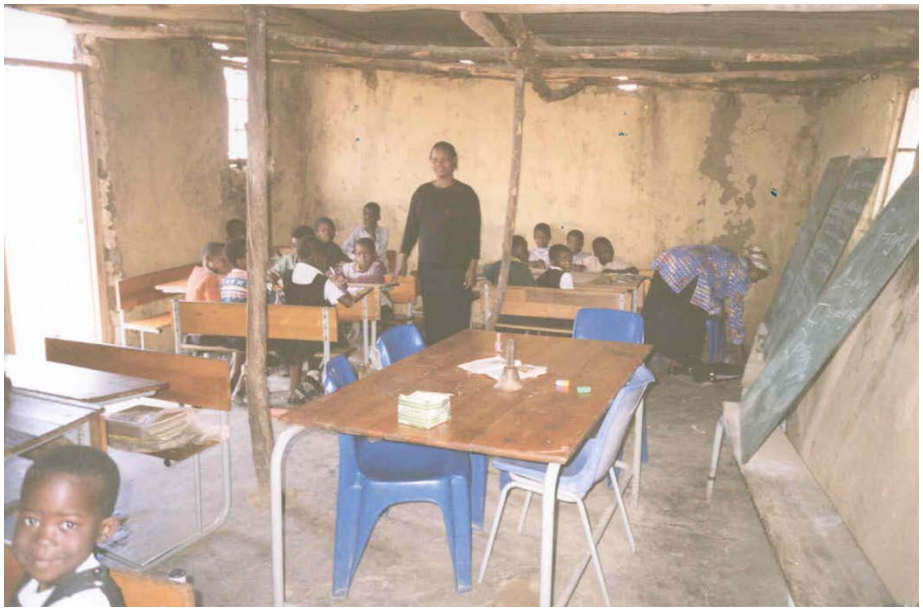
- Population growth and urbanisation
- Health – HIV/AIDS, Tuberculosis and malaria
- Economic growth and rising inequality
- Conflict and fragile states
- Rise of the knowledge economy and lessening need for manual labour.

CONDITIONS IN DEVELOPING COUNTRIES


School Smarts
School Smarts







Very poor schools

Poorly resourced schools

Well resourced schools

Enhancing ways of measuring across contexts

Key questions

- How do we ensure that our measures are valid and reliable given the diversity of environments, cultures, economies and policies?
- How do we deal with diversity?
- How do we ask children, teachers, principals and parents questions that they can equally understand irrespective of their situation and backgrounds?

Howie, 2010

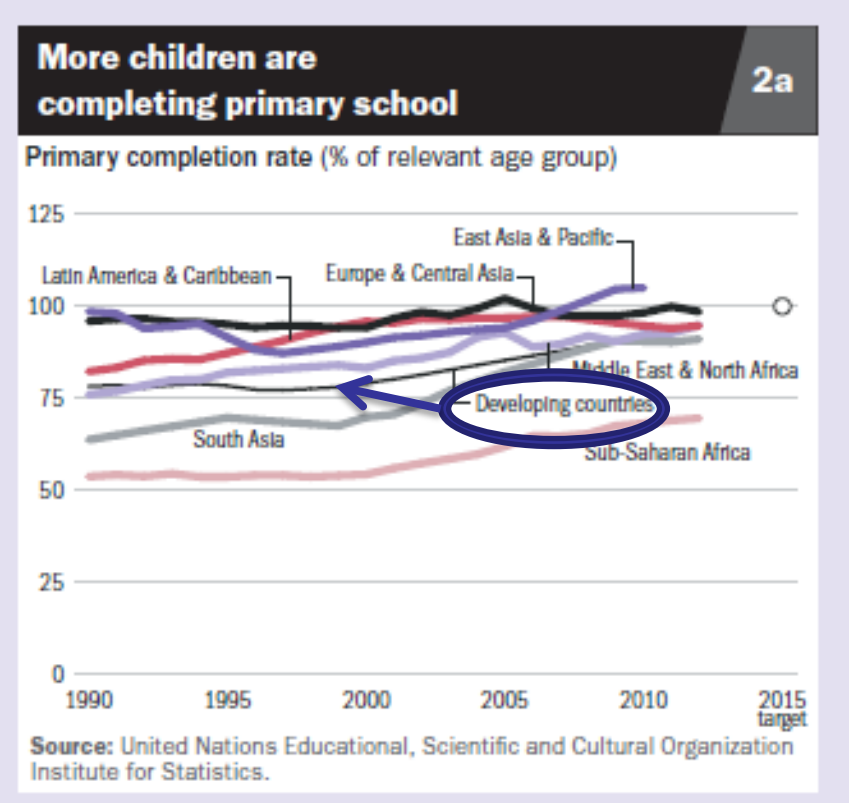
Cross National Validity

	High	Medium	Low
Cross-national	Written source		Principal behaviour "serious" Teacher education.
Regional	Parental education	Teacher education	Principal behaviour "serious"
National	SES	Type of community	Principal behaviour "serious"

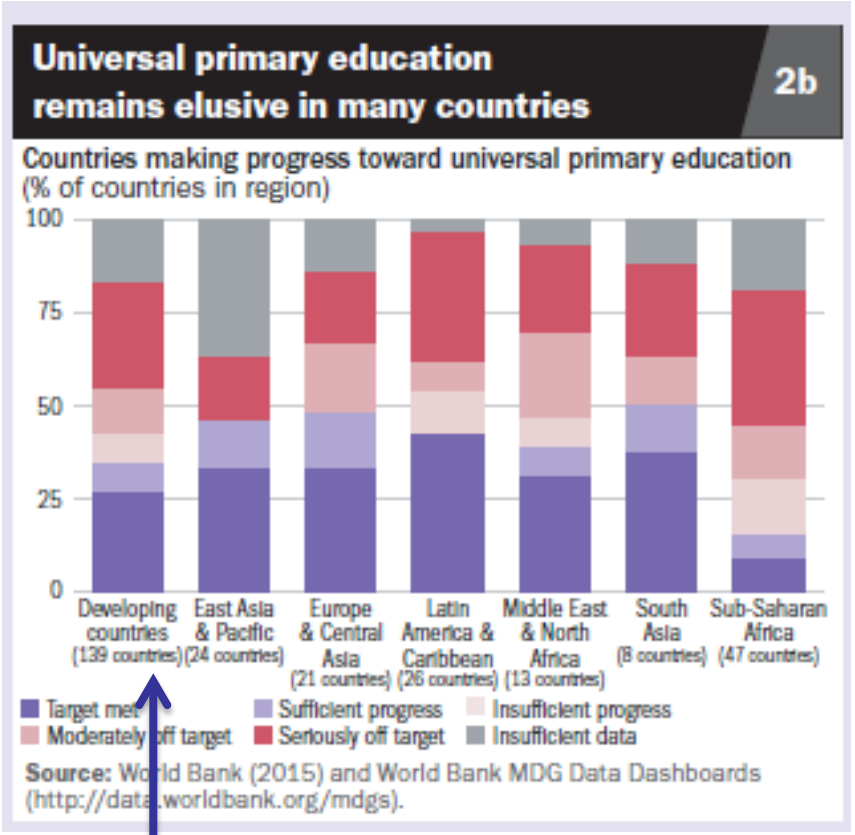
Howie & Plomp, 2001

Developing countries and international indicators of education

Primary completion rate



Developing countries



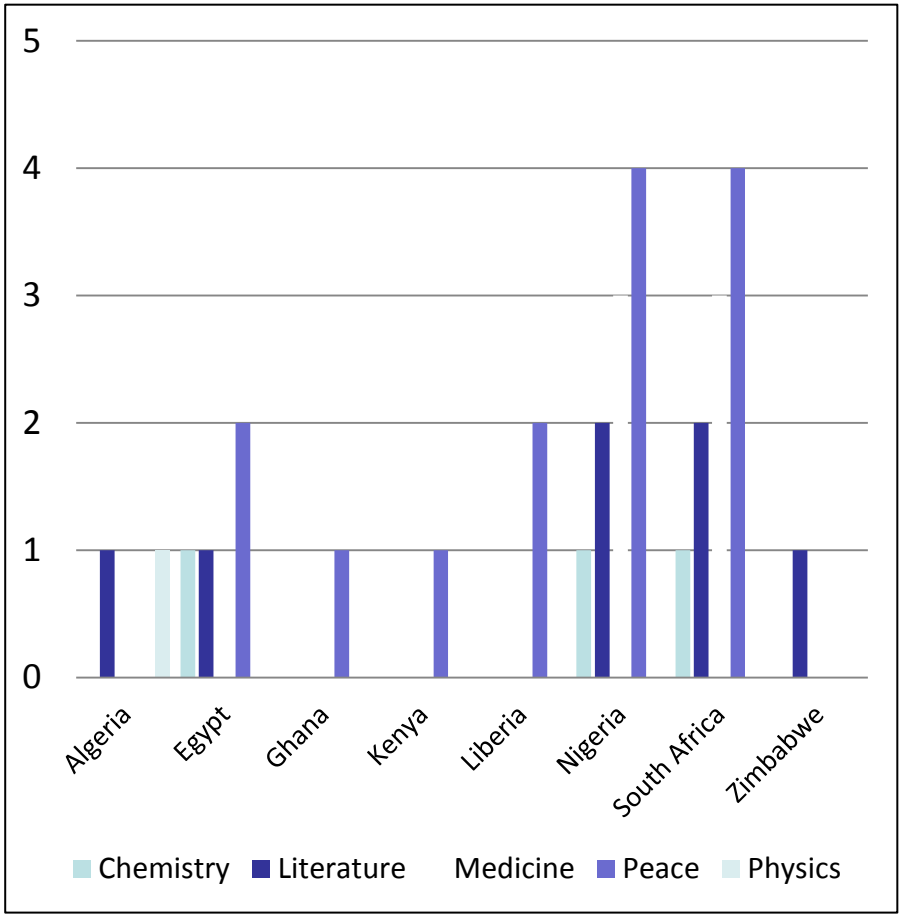
World Bank Development Indicators, 2015

Footprints across Africa

SOME KEY FINDINGS AND IMPLICATIONS FOR AFRICA

Africa: Cradle of Humankind

African Nobel laureates



http://www.cp-africa.com/2012/05/27/list-of-african-nobel-prize-winners/

South African Noble Laureates

Courtesy of Tony Daniels

http://www.sahistory.org.za/article/africa-timeline

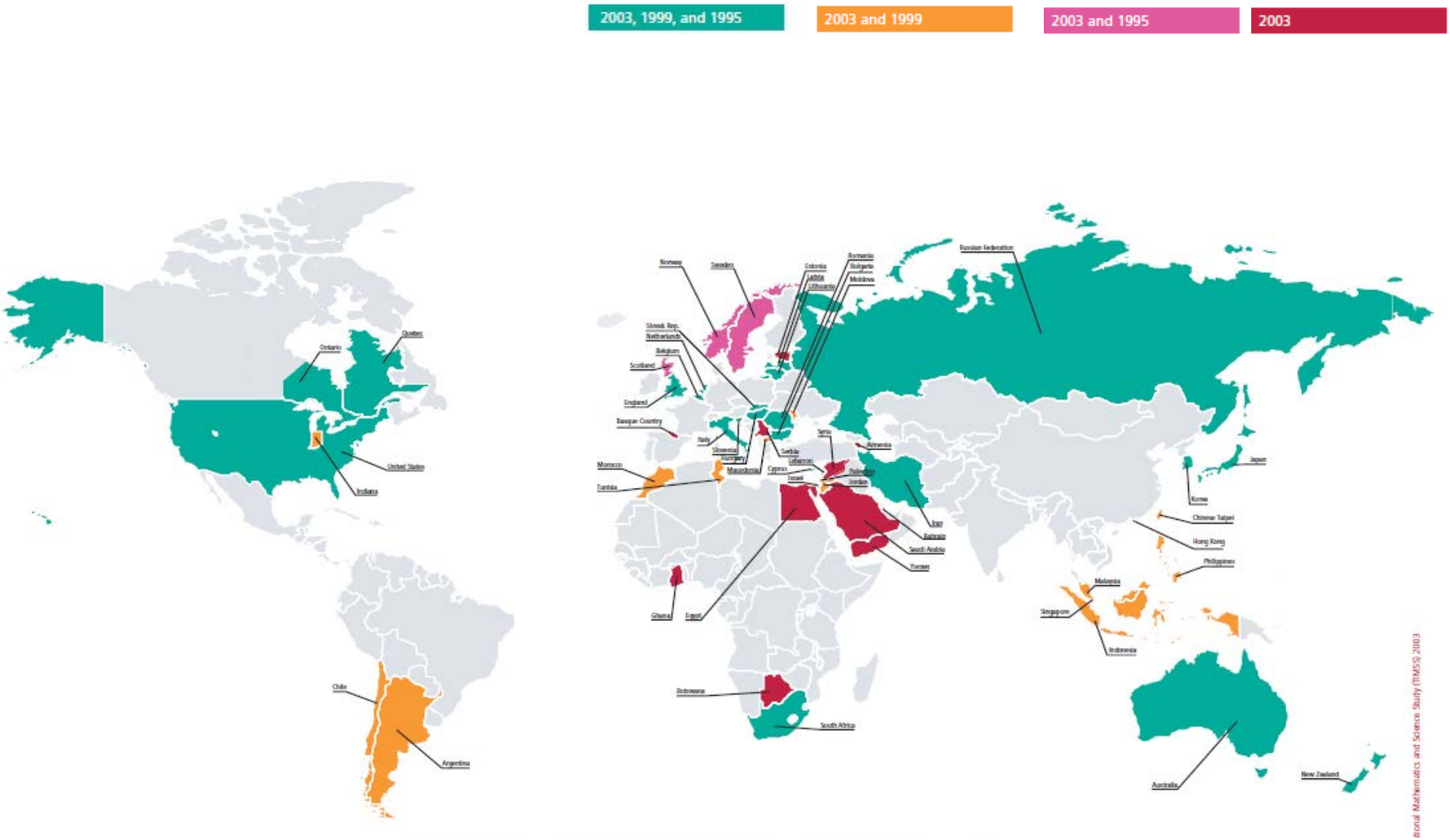
Growth of IEA studies in Africa

Pre 1990s	Post 1990s

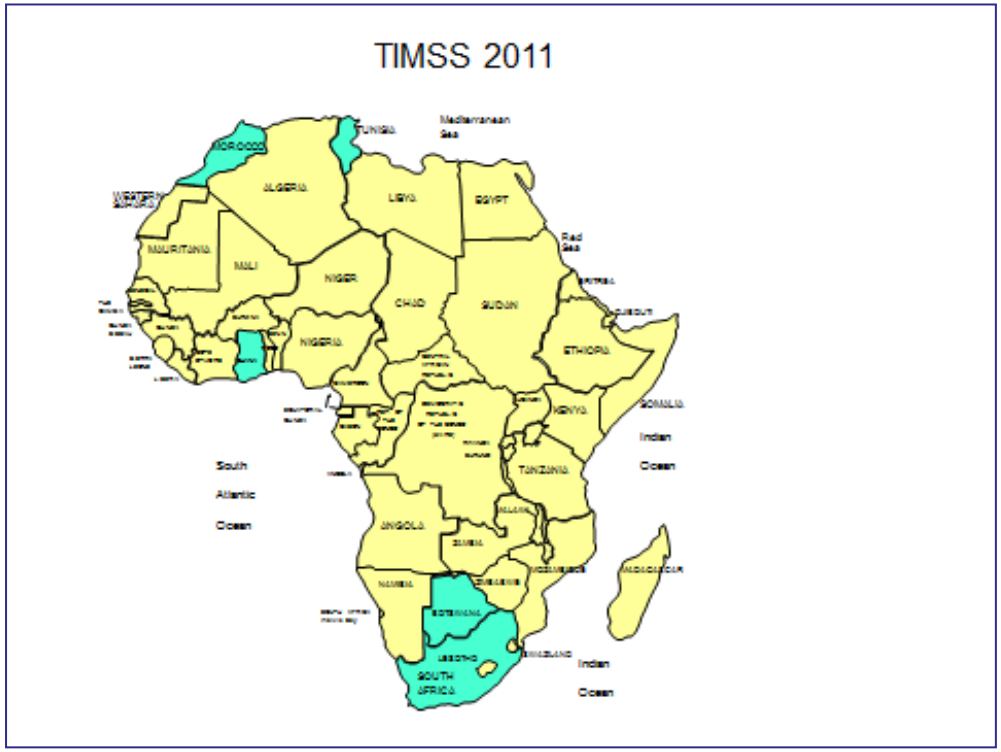
Pre 1990s African involvement in IEA studies

Post 1990s African involvement in IEA studies

Participation in Trends in Mathematics and Science Study 1995- 2003



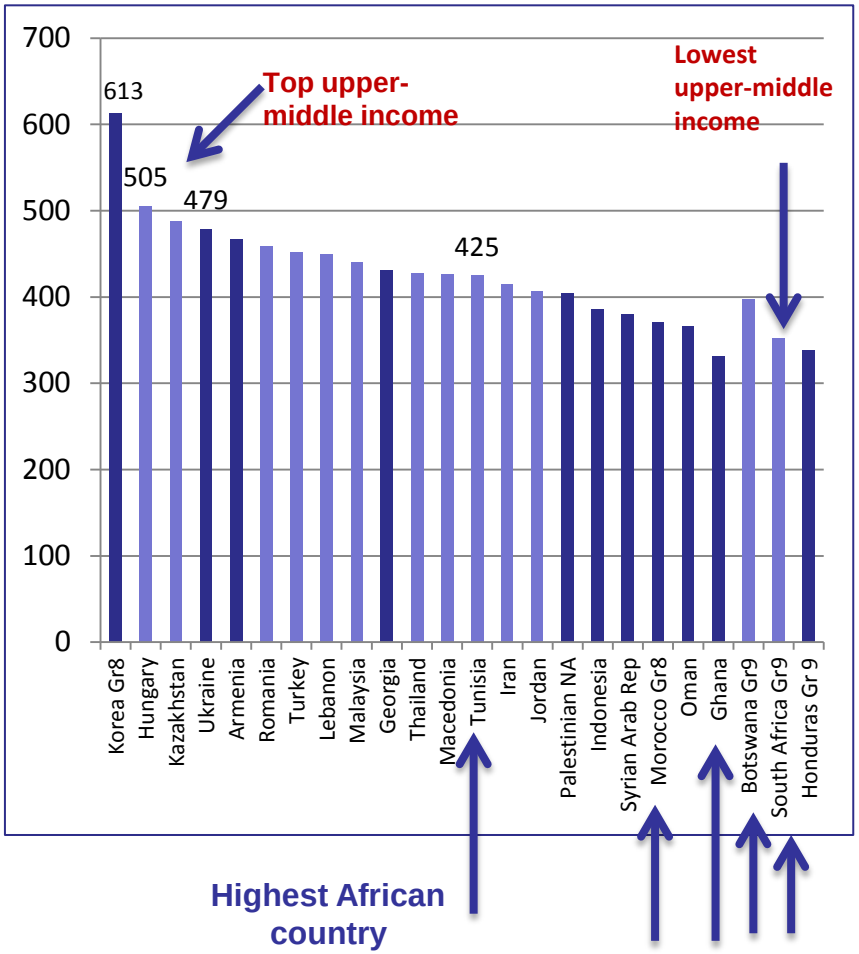
Trends in Mathematics and Science Study (TIMSS) 2011



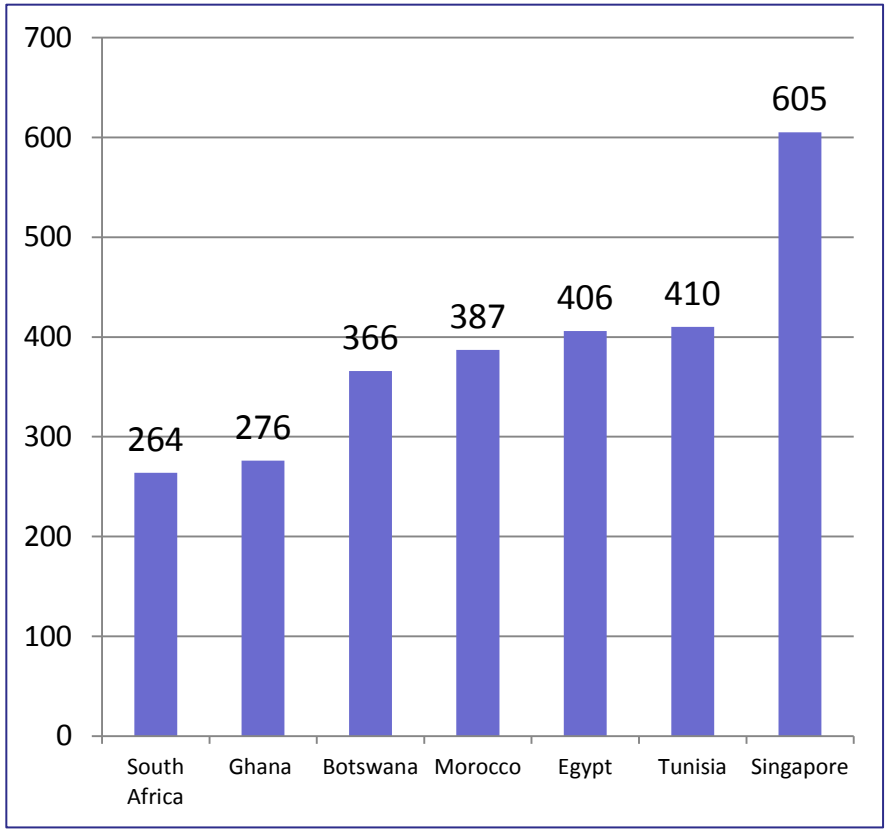
- 2 North Africa
- 1 West Africa
- 2 Southern Africa

African countries achievement in maths in TIMSS 2003 and 2011

Overall results, developing economies and top achieving country for maths 2011

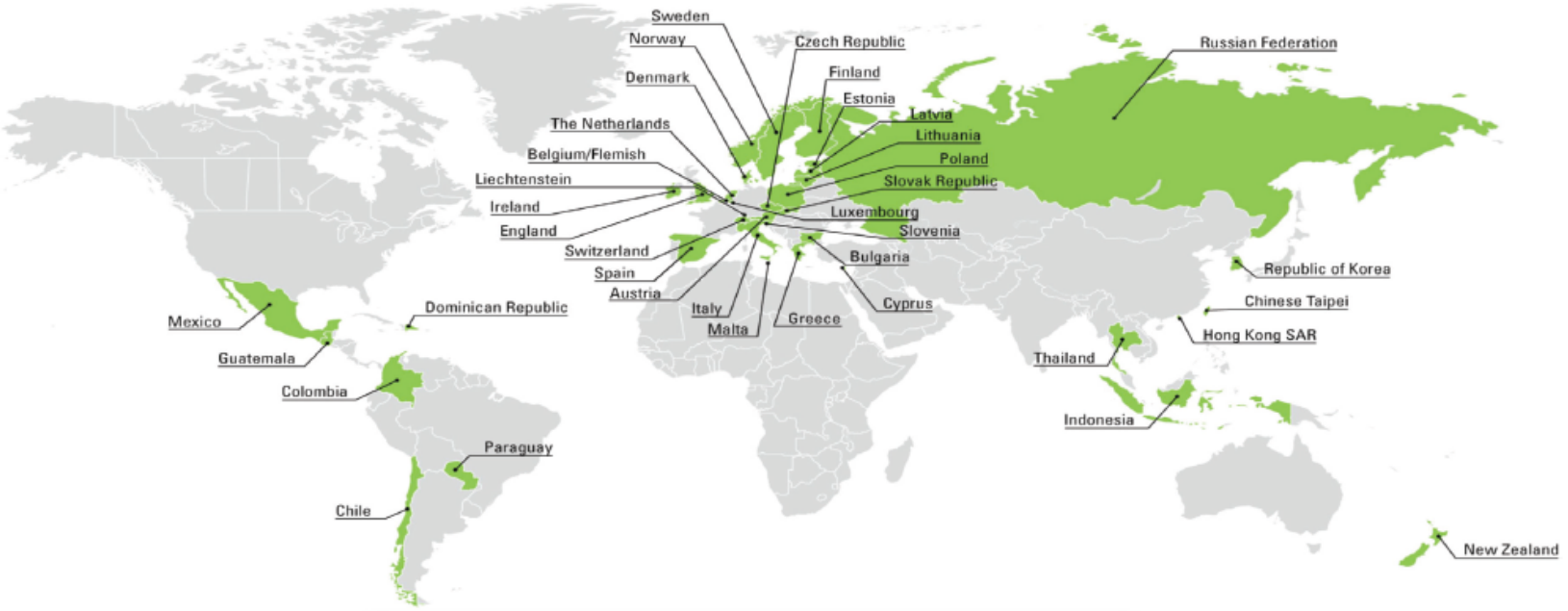


Overall results African countries and top achieving country for maths 2003



Why no African countries – ICCS 2009?

Figure 1: Countries participating in ICCS 2009



Participating Countries

Austria	Denmark	Indonesia	Malta	Slovak Republic
Belgium (Flemish)	Dominican Republic	Ireland	Mexico	Slovenia
Bulgaria	England	Italy	Netherlands	Spain
Chile	Estonia	Korea Rep. of	New Zealand	Sweden
Chinese Taipei	Finland	Latvia	Norway	Switzerland
Colombia	Greece	Liechtenstein	Paraguay	Thailand
Cyprus	Guatemala	Lithuania	Poland	
Czech Republic	Hong Kong SAR	Luxembourg	Russian Federation	

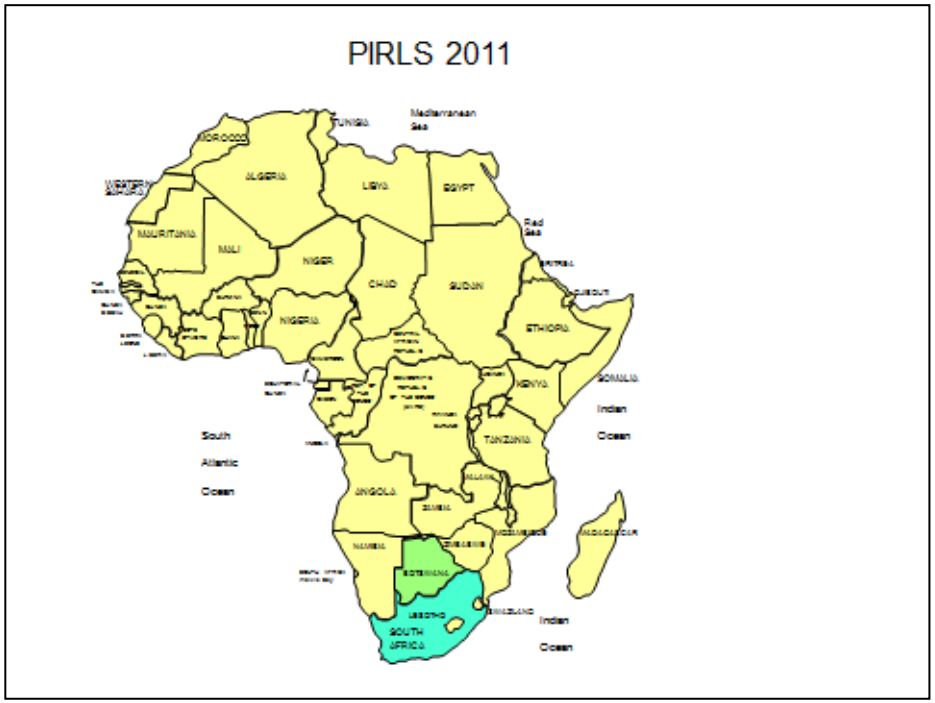
Why only 1 African country in SITES M1-M3?

Progress in International reading literacy Study (PIRLS) 2011

Background on PIRLS

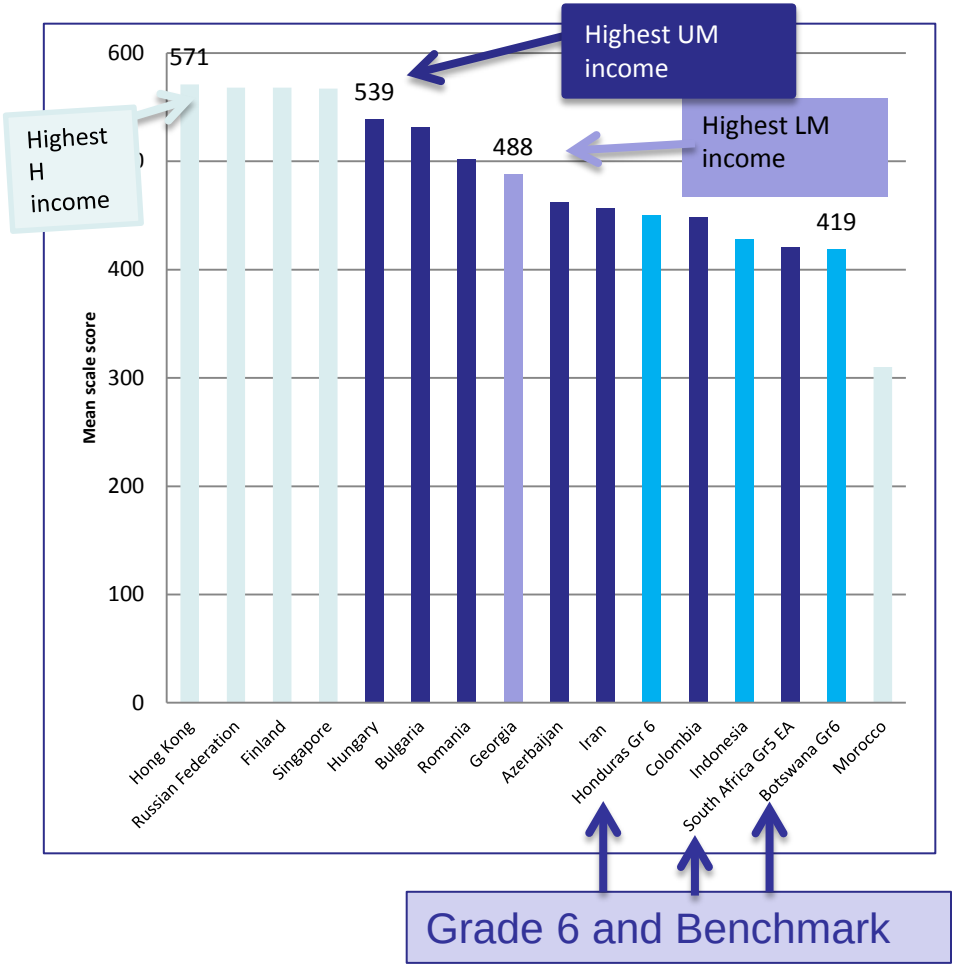
- Reading comprehension.
- The grade that represents four years of schooling, the mean age at the time of testing was at least 9.5 years (typically Grade 4).
- Measurement of changes since 2001
  - 1991, 2001, 2006, 2011, 2016.
- PIRLS and TIMSS both conducted in 2011, opportunity to assess the same fourth grade students in reading, mathematics, and science.

African map of participants

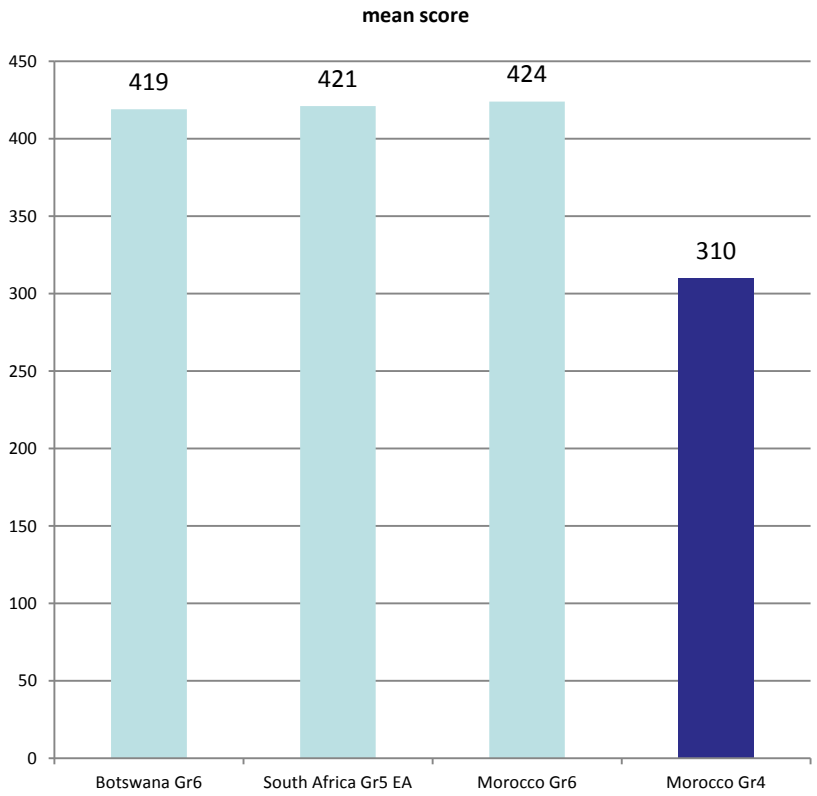


PIRLS 2011: Achievement in reading selected countries

Top achieving and developing economies performance in PIRLS 2011

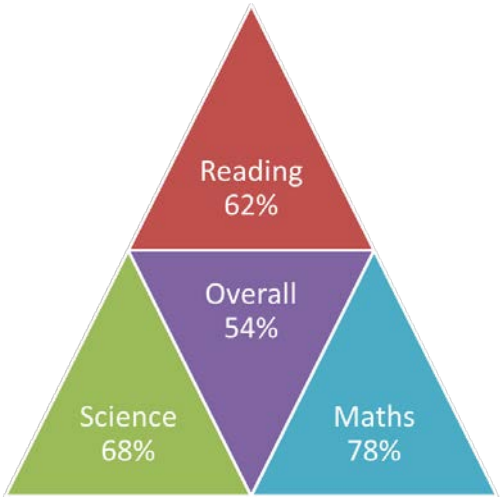


African Countries performance in PIRLS 2011

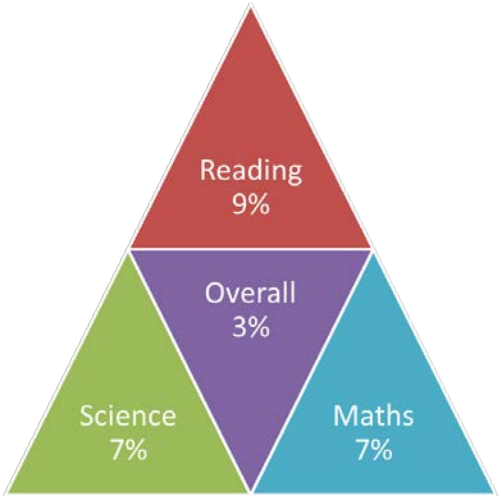


Comparative performance on High Benchmarks TIMSS & PIRLS 2011

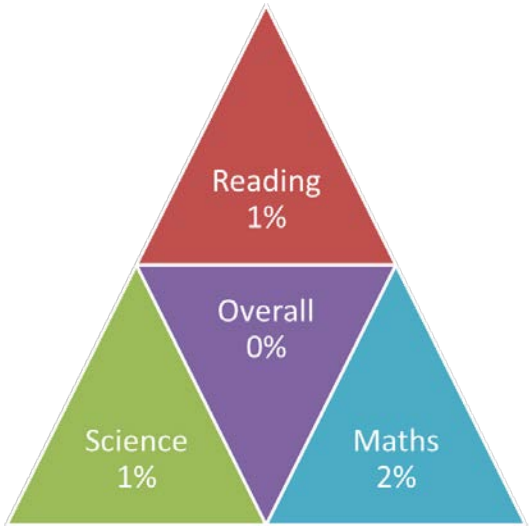
Singapore Grade 4



Botswana Grade 6

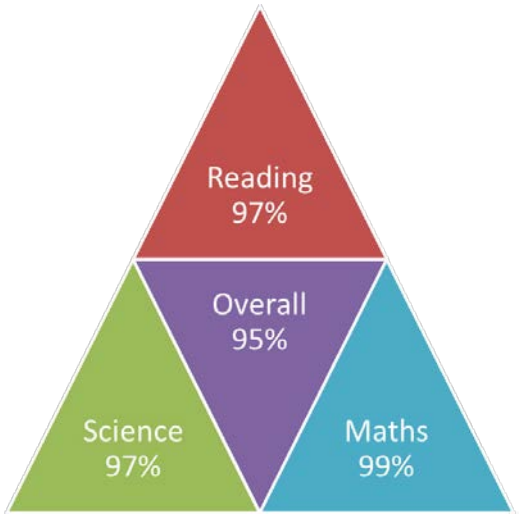


Morocco Grade 6

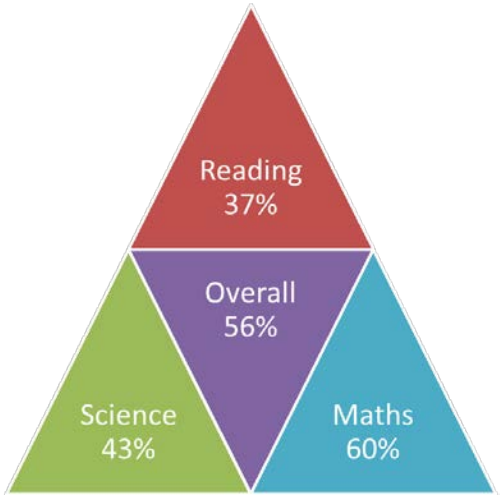


Comparative performance on Low Benchmarks TIMSS & PIRLS 2011

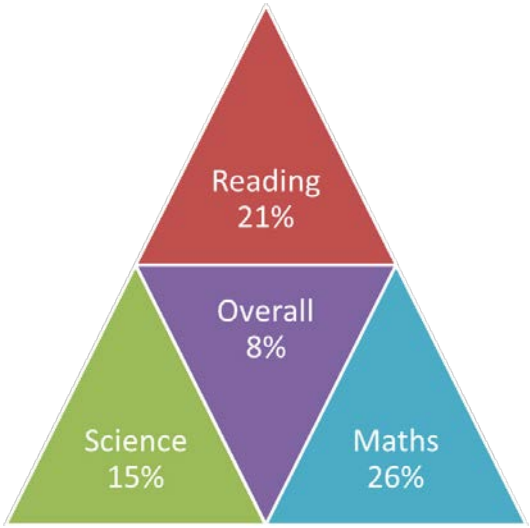
Singapore Grade 4



Botswana Grade 6



Morocco Grade 6



IMPACT AND MEANING FOR SOUTH AFRICA?

Some facts about education in South Africa

	2000	2013/ 2014
Net enrolment rate primary	89	99.4
Electricity	54.9	86
Water	71.2	97
Sanitation	90.8	98

77% have very basic facilities and meet basic safety norms.

- 12 655 436 learners
- 25 741 schools
- 2013 National Budget for Education R1.06 trillion (20%)
- 6.3% GDP
- Schooling: R232.5 Billion

DBE, 2014

South Africa's participation in IEA studies

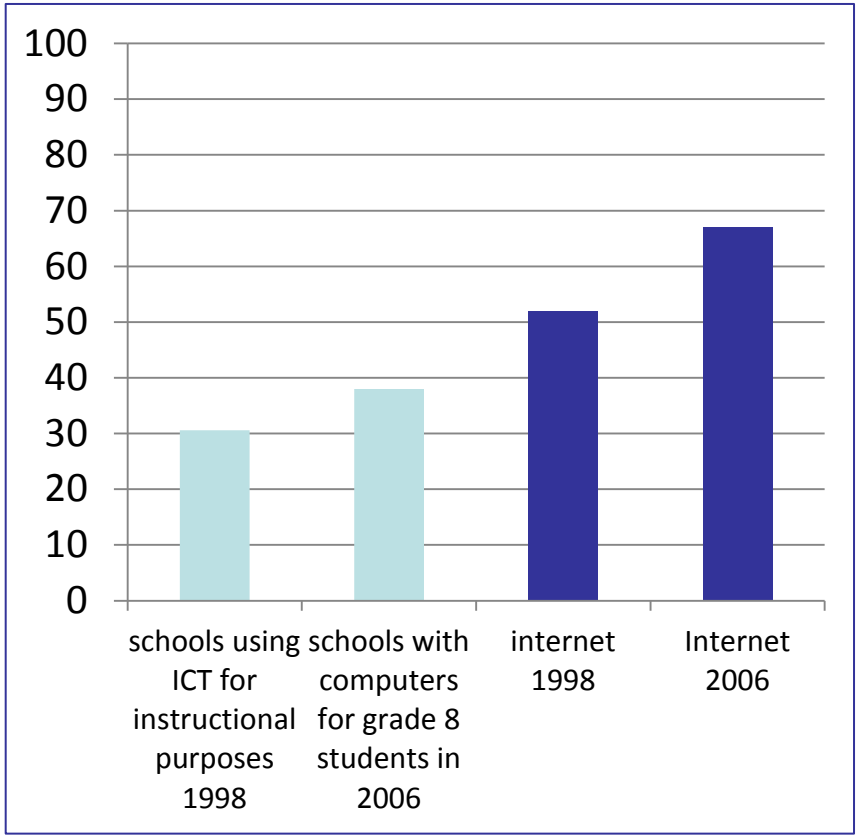
Progress in International Reading Literacy Study (PIRLS)	Second International Technology in Education Study (SITES)	Trends in Mathematics and Science Study (TIMSS)
2006	M1 (1999)	1995
2011	M2	1999
2016	2006	2003
		2011
		2015

Second International Technology in Education Study (SITES 2006) Key findings

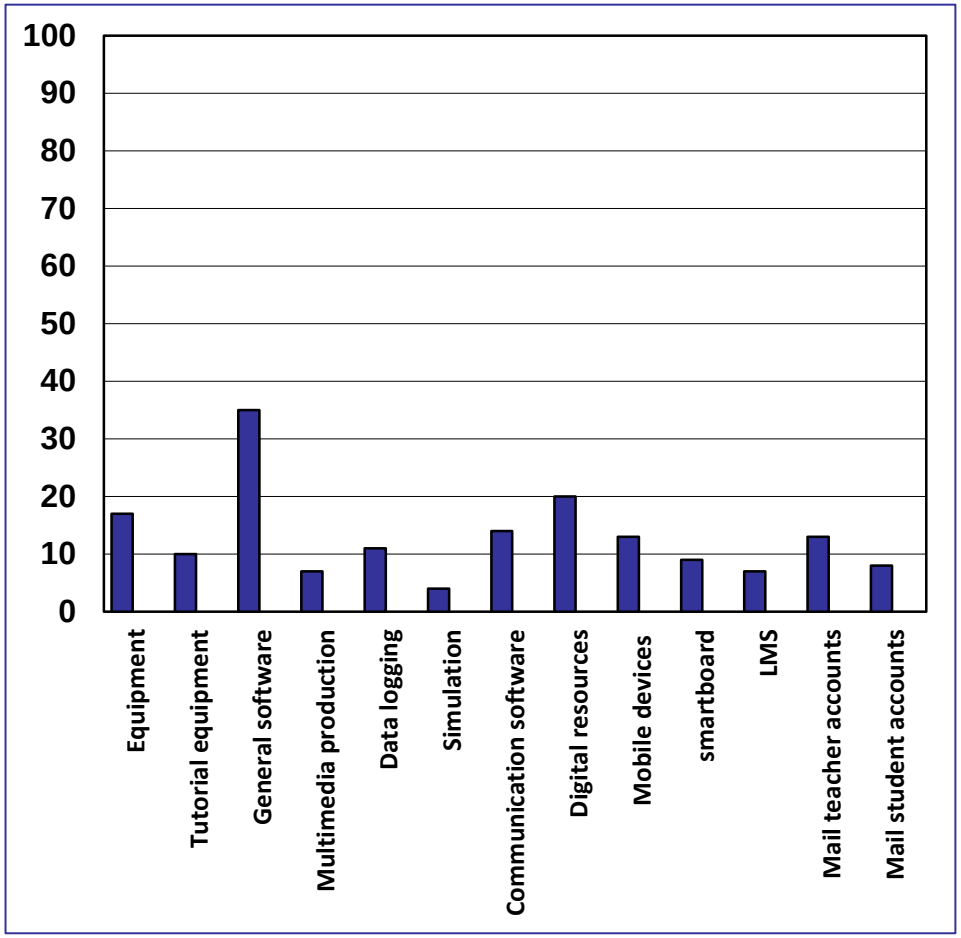
- SITES 2006
  - 9,000 schools
  - over 35,000 mathematics and science teachers
  - 22 countries/education systems in 2006.
- South Africa and 14 other countries participated in earlier studies (M1 and M2)
- Only 38% of South African schools had access to computers compared to most schools in other countries.
- Other countries had invested heavily in the technology, but not made changes to teaching methods and infrastructure.
- Most systems did not require their teachers to be trained in how to use ICT in their teaching.

Status of ICT in Education in 2006

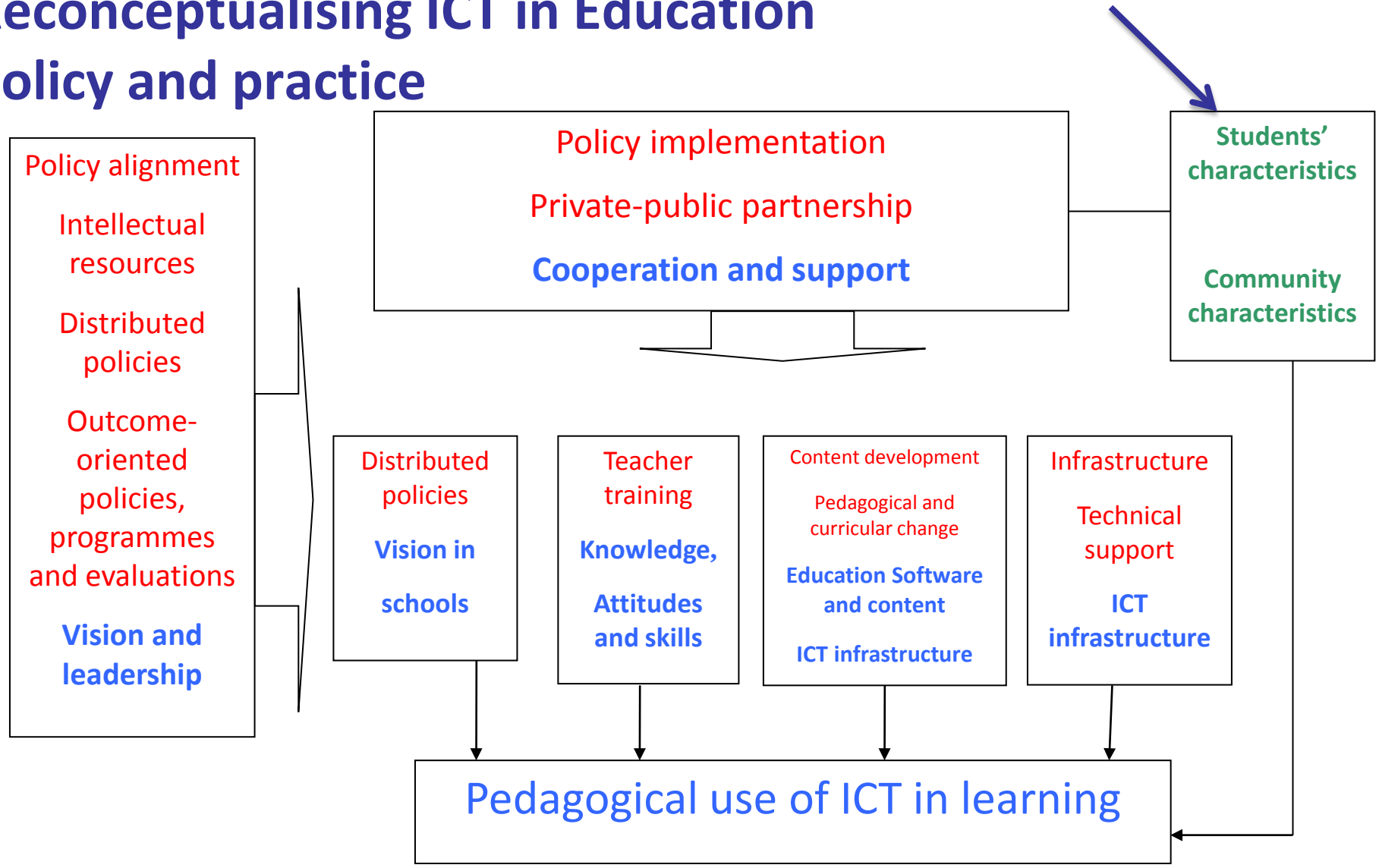
Access to computers 1998-2006



Availability of Technology in 2006



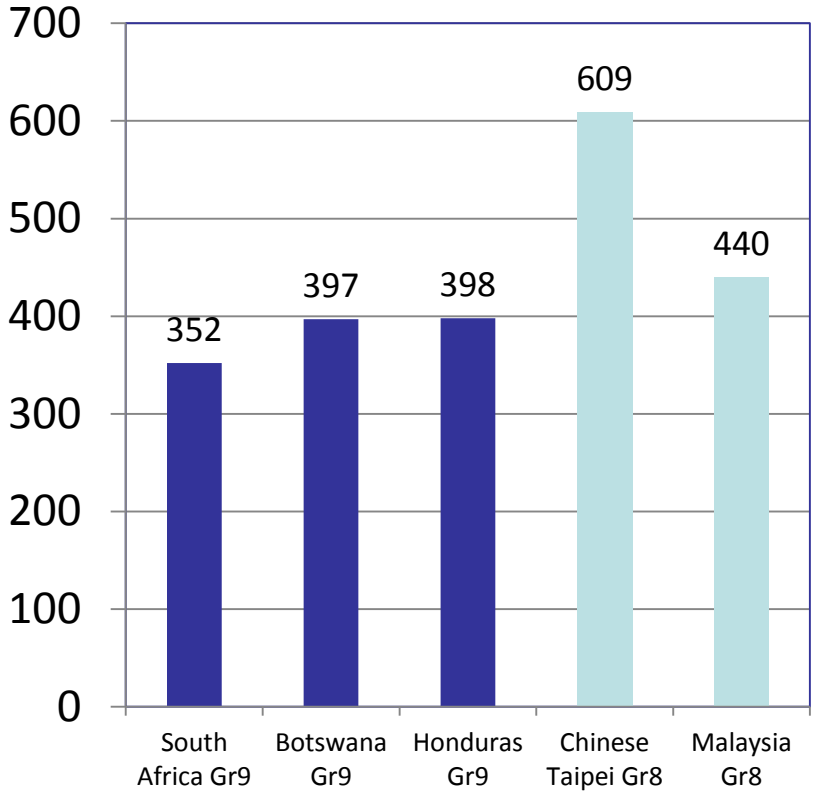
Reconceptualising ICT in Education policy and practice



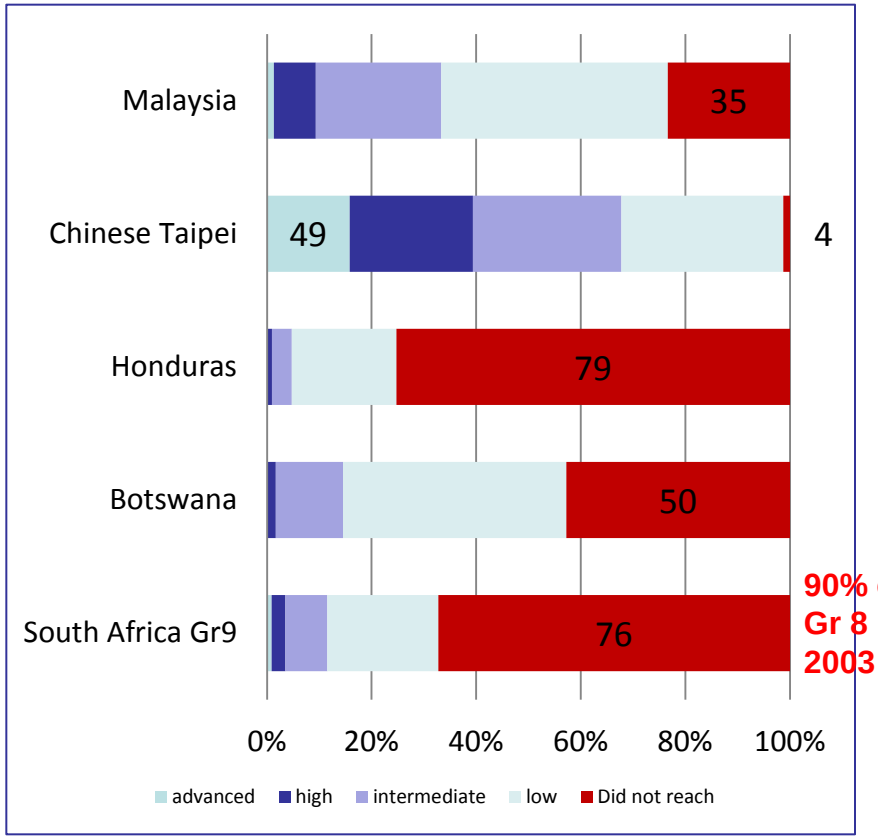
Factors related to pedagogical use of ICT in learning (Adapted from Kennisnet, 2008 and Kozma, 2008) in Howie, 2010.

TIMSS 2011 – key findings Maths

South African TIMSS Grade 9 mean scores 2011 and selected countries

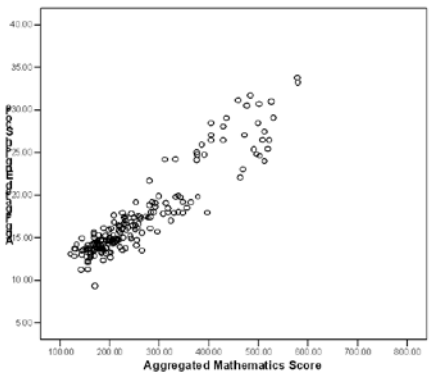


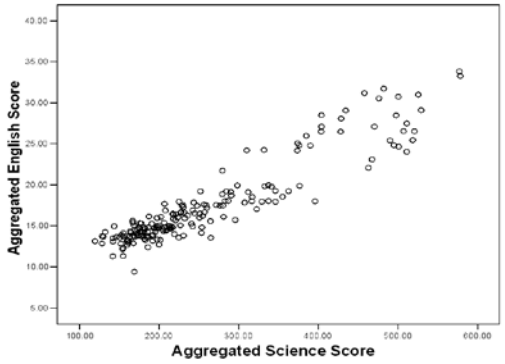
Benchmarks for South African TIMSS Grade 9 mean scores 2011 and selected countries



Progress In International Reading Literacy Study (PIRLS)

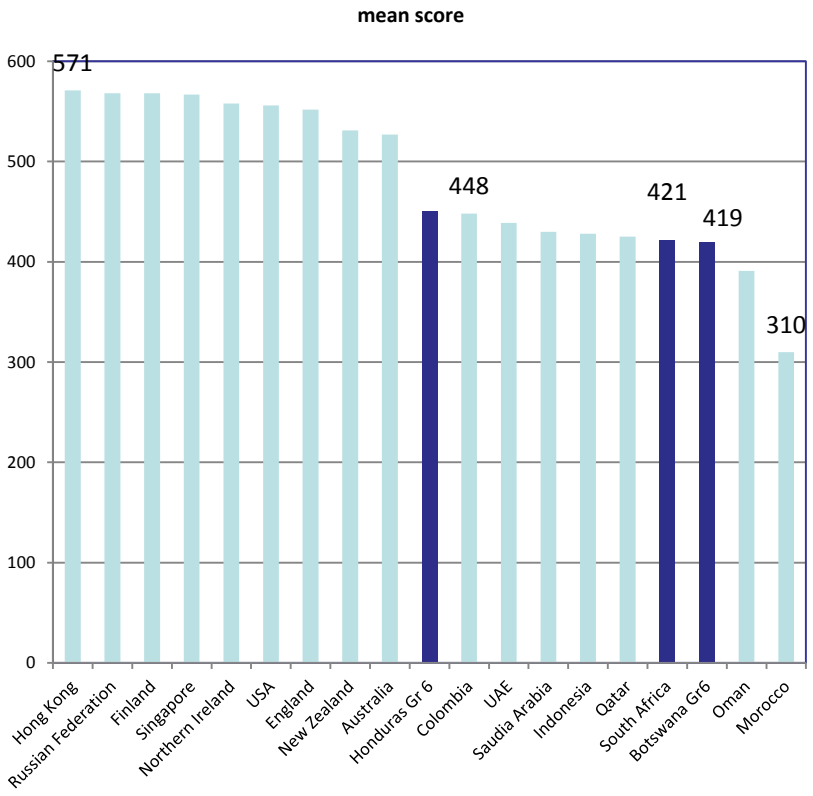
- 2006
  - Grade 4 (11 languages)
  - Grade 5 (11 languages)
- 2011
  - Grade 4 (pre-PIRLS 11 languages)
  - Grade 5 (English and Afrikaans)
- 2016
  - Grade 4 PIRLS Literacy (11 languages)
  - Grade 5 (English, Afrikaans, isiZulu)



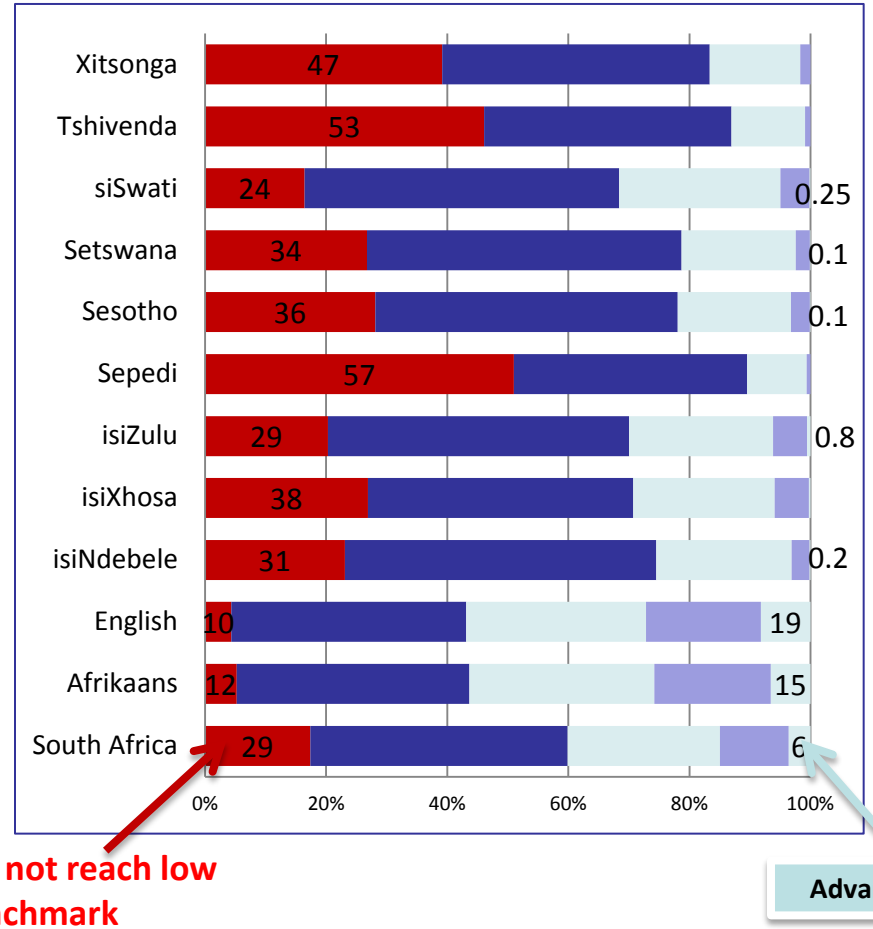


South African PIRLS 2011 performance

South African Grade 5 (Eng/Afr) PIRLS compared to selected countries Grade 4 learners



South African Grade 4 learners reaching prePIRLS benchmarks



If you're reading this, you're one of the few

Basic reading skills lacking in SA pupils, study reveals

SA literacy lowest among countries

KIM HELFRICH

LITERACY in South African primary schools is a long way behind that of other countries, so much so that Grade Four and Five pupils could manage only the lowest scores in a 40-country reading study.

This shocking result comes from the 2005 Progress in International Reading Literacy Study (Pirls), that also found the SA class sizes were close to double the international average of 24.

Only 2% of the 30 000 South African primary school pupils at 400 schools who took part in the study reached the top international benchmark for reading, while a staggering 78% have not developed the basic reading skills required for learning.

South Africa was among the highest when it comes to bilingualism, said Prof Sarah Howie, co-national research co-ordinator for Pirls, and director of the Centre for Evaluation and Assessment at Pretoria University.

The result of Pirls 2005 were released in Centurion yesterday to coincide with the international release of the study data in all 40 participating countries.

Eighty-seven percent of children in the Russian Federation, the top-performing Pirls country, have formal reading time during the school day, while this figure in South Africa is a low 30%.

In addition to reading literacy, Pirls also collects information from parents/guardians, pupils and principals about the home and school environment.

– *kimh@citizen.co.za*

FEAR AT SCHOOLS

- THREE out of four primary pupils don't feel safe at school.
- Sixty percent of primary schools do not have a library.
- Poor resources hit teaching at one in five primaries.
- Only half of the country's primary schools have sufficient instructional material.

SA flops in international reading skill test

Of 40 countries tested, with primary pupils' average score at 500, SA was placed last, with results in a 250-300 range

■ Leerlinge se leesvaardighede nie op peil

SA vaar swakste in toets

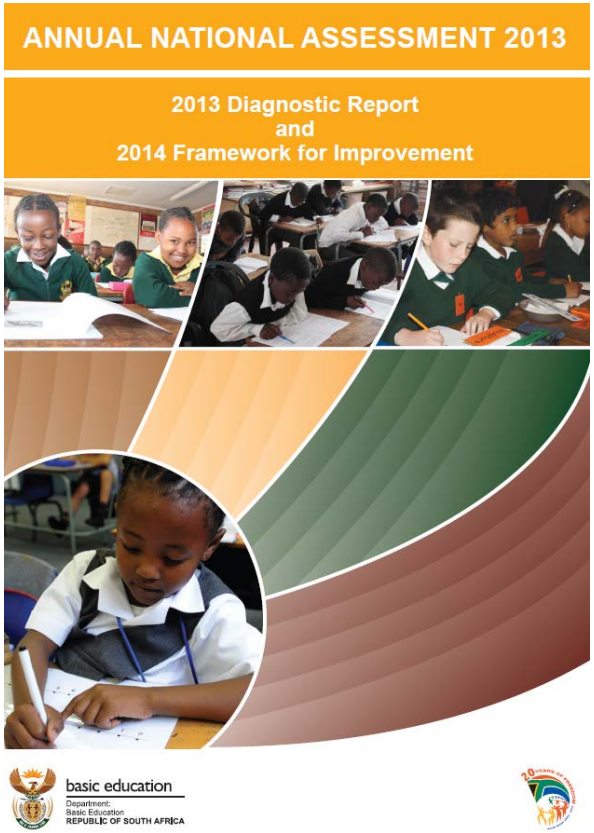
Education official bunks the release of scary study

SA scores poorly in literacy stakes

Scandalisation; Glorification, Indifference (Steiner-Khamsi, 2014); Justification

Impact and meaning for South Africa?

National assessment report



Attempt to learn from PIRLS 2011

9.2 Lessons from the 2011 Progress in International Reading Literacy Study

South Africa participated in the **2011 Progress in International Reading Literacy Study**, one of a series of studies focusing on progress in reading literacy in (1) reading for literary experience and (2) reading to acquire and use information. 2011 PIRLS reports achievement at the following four points along the scale as international benchmarks:

- *Advanced International Benchmark*: the ability to integrate ideas and information across texts to provide reasons and explanations;
- *High International Benchmark*: the ability to make inferences and interpretations with text-based support;
- *Intermediate International Benchmark*: the ability to make straightforward inferences;
- *Low International Benchmark*: the ability to locate and retrieve information from different parts of the text.

Questions in the 2013 Annual National Assessment in Languages for Grades 1-6 and 9 reflect the same benchmarks. The ANA Language papers included different reading texts pertinent to the grade with questions that reflect different levels of achievement. Writing tasks were similarly graded.

Expose learners to the **activities and questions** that are pitched at these **different levels**, but provide support, especially in lower grades. The ANA analysis revealed that learners performed fairly well when they only needed to locate and retrieve information from a text (the PIRLS Lowest International Benchmark). However, making inferences and interpretations and integrating ideas and information from different texts is proving a challenge for many learners.

Reflections on PIRLS & TIMSS studies in South Africa

Achievement results dominated discourse for both studies

PIRLS

- Political imperative to test all 11 languages.
- The very poor results in PIRLS 2006 were lower than have been predicted.
- National outcry and in Parliament questions were raised about this poor performance.
- prePIRLS 2011 serves as an important new baseline for Grade 4 for PIRLS 2016.
- PIRLS 2016:
  - PIRLS Literacy Grade 4, 11 languages;
  - PIRLS Grade 5 English, Afrikaans and isiZulu

TIMSS

- Initially introduction of the international and regional studies was (and still is) controversial in South Africa.
- TIMSS 1995 results produced outrage re very low performance of the South African learners.
- The business community and public were shocked (Howie, 2001).
- TIMSS 1995 and subsequent international and regional studies revealed the damage of past political policies, and difficulties of implementing effective change in teaching and learning .
- TIMSS 2003 and 2011 have been used in government policy documents and funding motivations.

IEA foot print

- Mirror
  - TIMSS 1995
  - PIRLS 2006
- Monitoring
  - TIMSS 1999 and 2003
  - PIRLS 2011
- Enlightenment
  - TIMSS 1995 and PIRLS 2006
- Capacity development
  - 20 years

Box 1

In reaction to questions raised in parliament regarding the quality of literacy and numeracy of primary school learners, Minister Pandor had this to say: *"National Systemic evaluations conducted by the Department of Education in 2001 and 2004, revealed low levels of reading abilities across the country. The results of the Progress in International Reading Literacy Study (PIRLS), released in November 2007, found that learners in our schools do not read at the appropriate level in relation to their grades and in terms of their age.*

Various reasons were provided for this: Lack of access to books in homes, at school and in community, low levels of literacy among the parents and ineffective teaching practices

I have responded to these findings through the following initiatives:

- *On the 18 March 2008 I launched the Foundation for Learning Campaign, a four-year programme to improve the reading, writing and numeracy skills and abilities of all South African children. The Campaign has provided teachers and schools with clear directives on expected levels of learner performance. The focus will be on primary schooling – starting with the Foundation and Intermediate Phases – so that learners acquire and sustain a solid foundation for learning. All primary schools will be expected to increase average learner performance in Literacy/Language and Numeracy/Mathematics to no less than 50% - indicating an improvement of between 15-20% - in the 4 years of the campaign.*
- *The Department has also focused on providing resources to all schools. In the past three years we have provided over 11,000 primary schools with exciting story books, written in all official languages of South Africa, establishing classroom libraries. Through the USAID-funded Ithuba Writing Project, we are distributing 2.3 million locally authored books in the different official languages to schools. All 2.3 million books should be in our schools by the end of the financial year.*
- *Two years ago, I initiated a Drop All and Read Campaign, which welcomed Grade R and 1 learners into education with their own branded bags containing a selection of books that they can read for themselves or that parents and caregivers can read to them. At the heart of the campaign is that in our homes and in our schools children should be able to pick up books that they can read for enjoyment.*
- *We can continue to supply schools with reference materials, which have included bilingual dictionaries. We have also provided all schools with:*
  - *The National Reading Strategy document which outlines activities and approaches to promote and develop the reading skills of our learners and*
  - *A Teachers handbook entitled Teaching Reading in the Early Grades to assist teachers on methods, approaches and activities to improve their teaching of reading.*
- *A Toolkit for teachers was developed continuing both reading resources as well as guides for teachers; 1000 have been sent to pilot schools countrywide to increase support for the teachers in their teaching of reading.*
- *The Department has developed an Early Grade Reading Assessment instrument, which is currently being used by teachers in selected districts to help us monitor progress in the different schools. The instrument is currently in use for Sepedi, Xitsonga, Tshivenda, isiXhosa and English and during the course of this year the tool will be developed in the remaining five languages.*
- *The implementation of the National Policy Framework for Teacher Education and Development will also address the issue of teacher development and ensure that through the IPET and CPTD programmes teachers are trained to teach effectively.*
- *To monitor whether learners are improving competency, the Department is establishing baseline data on learners' achievement literacy and numeracy in the early grades. As part of the Foundations for Learning, primary school learners will be assessed annually using standardized tests to monitor their progress against the established baseline.*

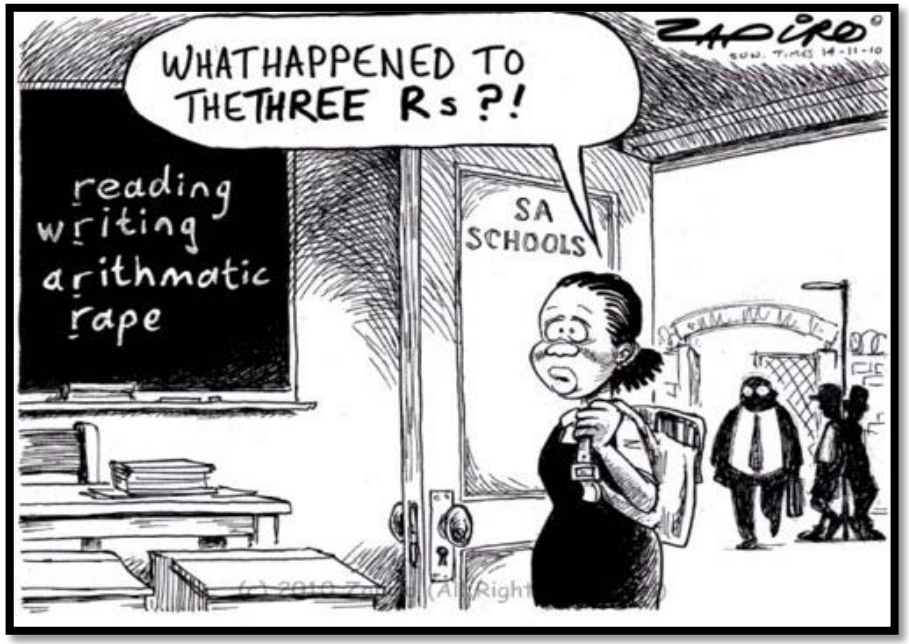
Source: National Assembly, Internal Question Paper 9/5/2008 in Howie, 2011:

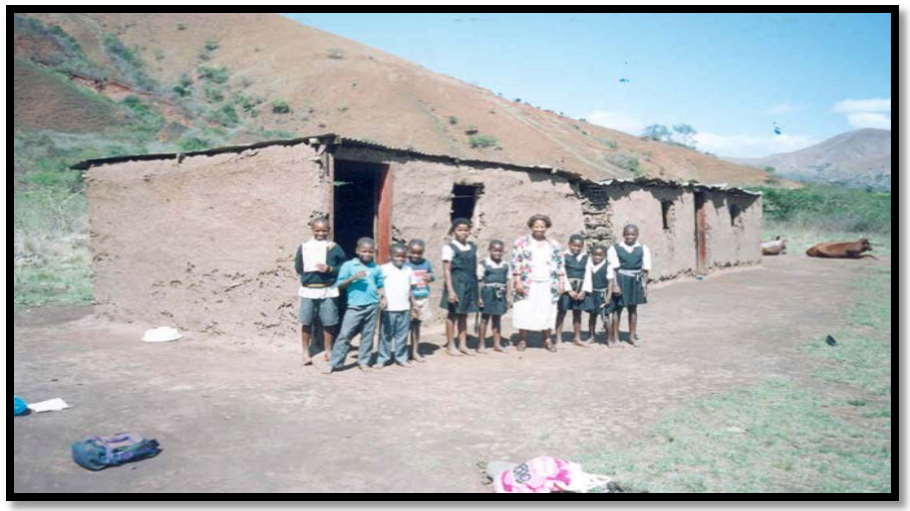
Significant findings from IEA studies in South Africa

- Evidence of systemic failure in education despite almost universal access
- Non-achievement of benchmarks and learners 2 to 4 years behind
- Classroom conditions slow to improve but improvement e.g: Class size
- Curriculum revision over past 20 years
- Enlightenment of broader interest groups
- Predictors of achievement, e.g.: Language effects and Poverty evident
- Reading in African languages a problem – but few teachers graduating with African home language (13%, but 83% of learners are African)
- IEA studies have had an effect:
  - E.g. TIMSS and Instructional days – gazette
  - PIRLS 2006 and List of initiatives in reading
  - PIRLS findings and outcomes are contributing to Language of learning discussions
  - Revealed national status of ICT in education in South Africa
  - Curriculum development and teacher training.

Difference in priorities in developing contexts

Ensure safe and secure environment for school staff and learners





Courtesy: Zapiro

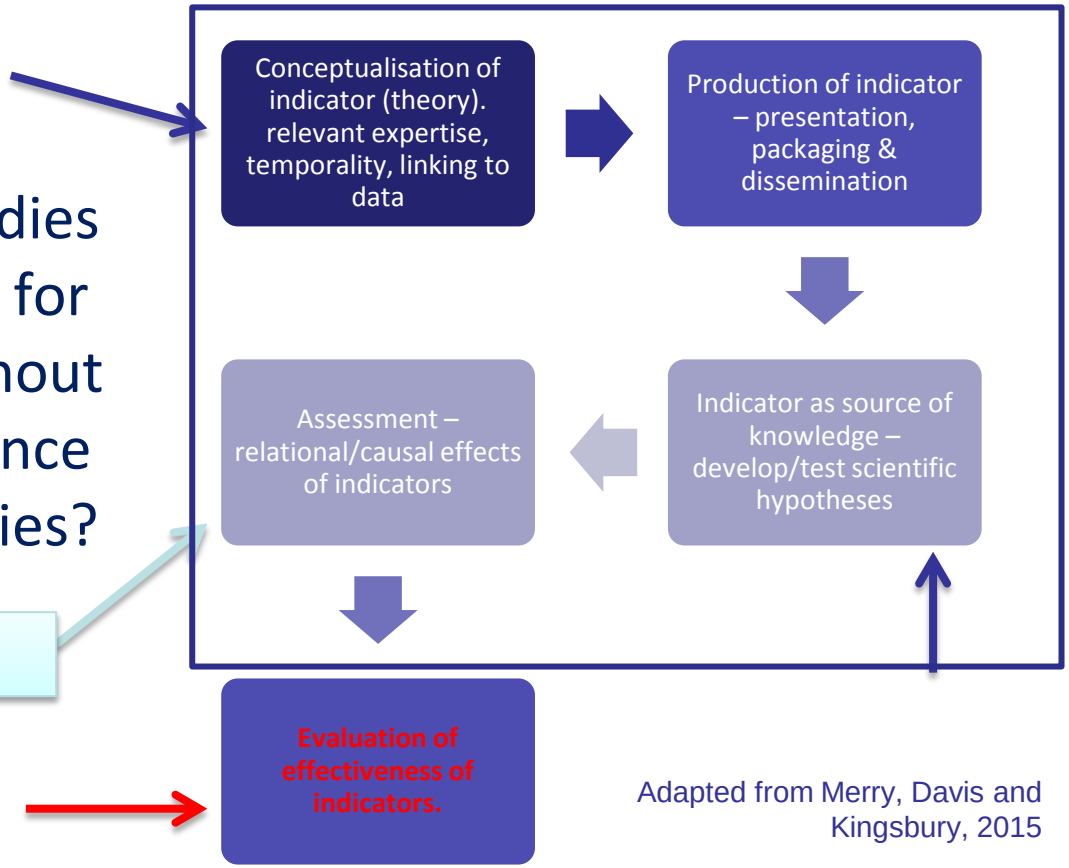
Reflections upon IEA involvement on the African continent and in developing contexts

- What are the challenges?
- Possible contributions?

Reflections upon IEA involvement on the African continent and in developing contexts

How can IEA make its studies more attractive/relevant for developing countries without compromising the relevance for the developed countries?

Phases of development and use of indicators



Adapted from Merry, Davis and Kingsbury, 2015

Meaning for South Africa

"Education is the most powerful weapon which you can use to change the world."

"As long as many of our people still live in utter poverty, as long as children still live under plastic covers, as long as many of our people are still without jobs, no South African should rest and wallow in the joy of freedom."

Nelson Mandela

Meaning for South Africa

- If we fail to provide relevant and effective education to our poorest and young citizens of our country we doom them to an almost unbreakable cycle of poverty where only the very brightest will escape.

- International comparative education studies use the world as an educational laboratory to broaden national perspectives; to raise expectations about what might actually be possible and to assist us in deciding what is relevant and effective education.

Final word

"…hopes that the educative function of IEA will continue to guide the process of basing educational policies on a foundation of evidence and not on whims or simple beliefs that have no evidential base".

Richard Wolf, 2011, p.285

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Thank you for your attention