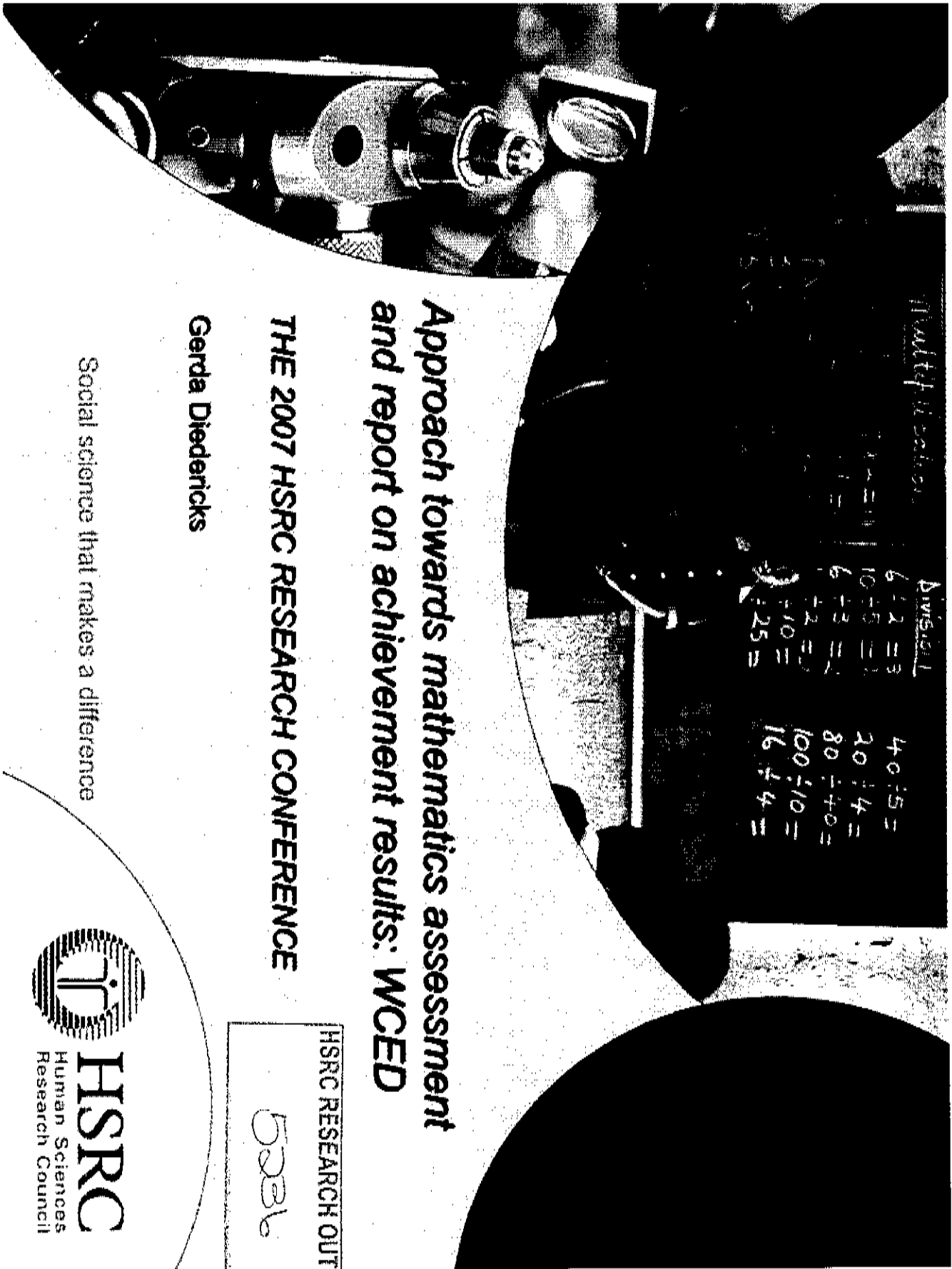


Duplicate



**Approach towards mathematics assessment
and report on achievement results: WCED**

THE 2007 HSRC RESEARCH CONFERENCE

Gerda Diedericks

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HSRC RESEARCH OUTPUTS
5236



***Approach towards mathematics
assessment and report on achievement
results: WCED***

**Paper presented at the 2007 HSRC
Research Conference**

27 September 2007

Gerda Diedericks

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Background

- **Measure performance at Grade 8 level**
- **Articulate with NCS**
- **International Benchmarking**
- **Prioritise learners with potential**
- **Language accommodation**
- **Diagnostic information required**

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Test design and Methodology

- Based on TIMSS items for International benchmarking
- Maths test indicate potential for achievement in FET
- Afr & Eng versions with A/E/Xhosa glossing to accommodate language
- Diagnostic scoring and feedback
- Assessment framework based on curriculum (NCS)

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Interpretation of learner results

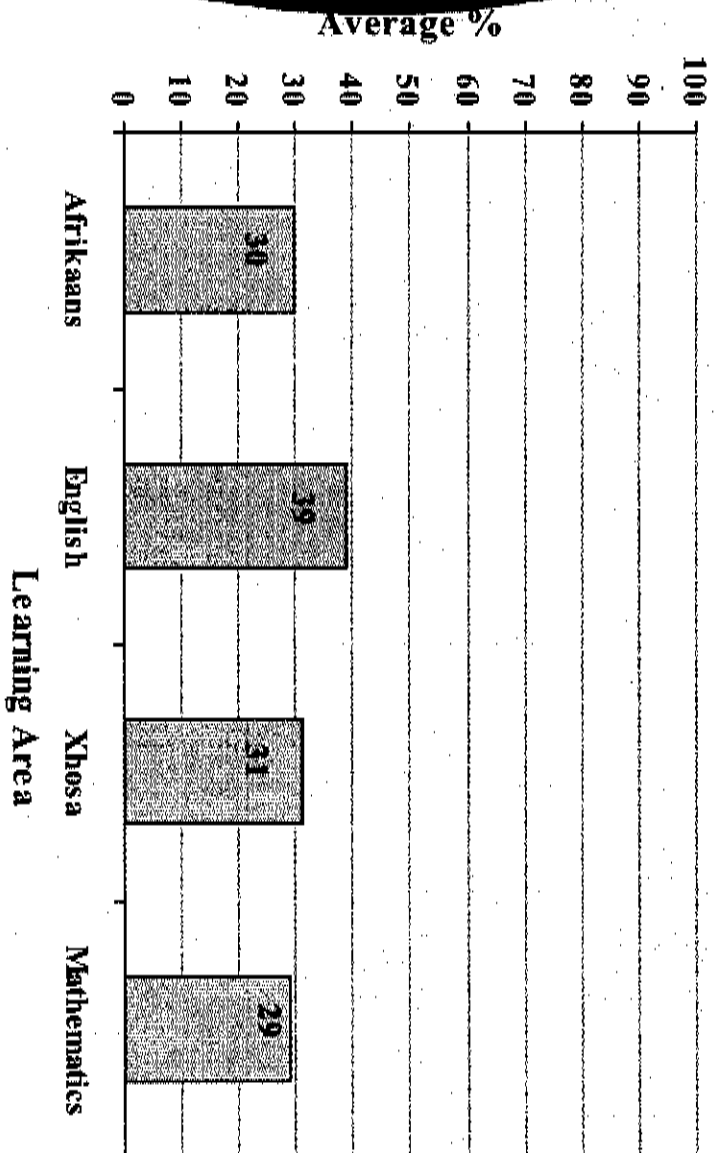
- EMDC
- Maths content domains (LOs)
- Cognitive domains
- Item type (MC/CR)
- Gender
- Number of books at home
- HL&LoLT
- Diagnostic analysis
- DoE (2005) seven-point scale

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Provincial average score per LA

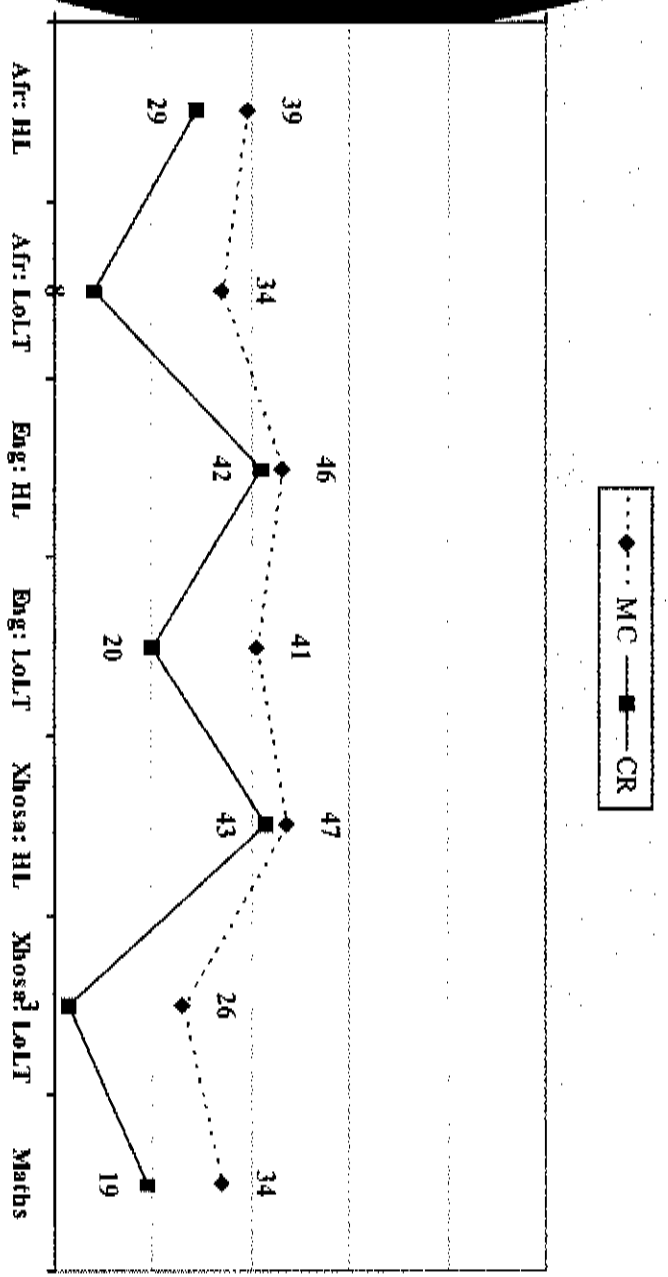


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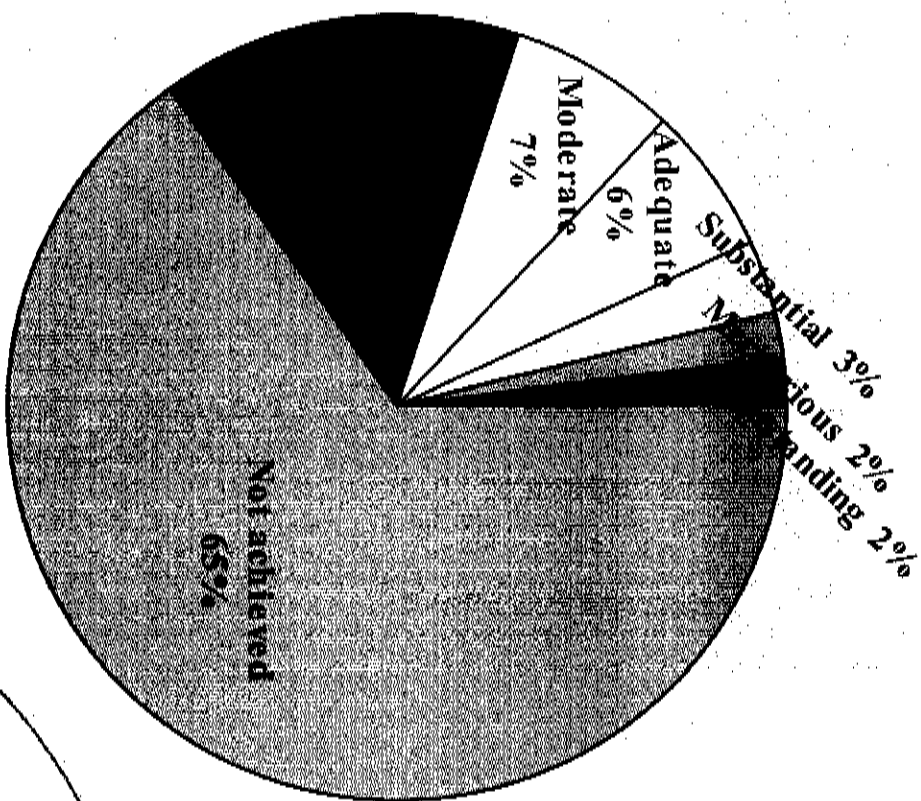
Comparison of achievement: MC/CR



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Percentage of learners at each performance level in Mathematics

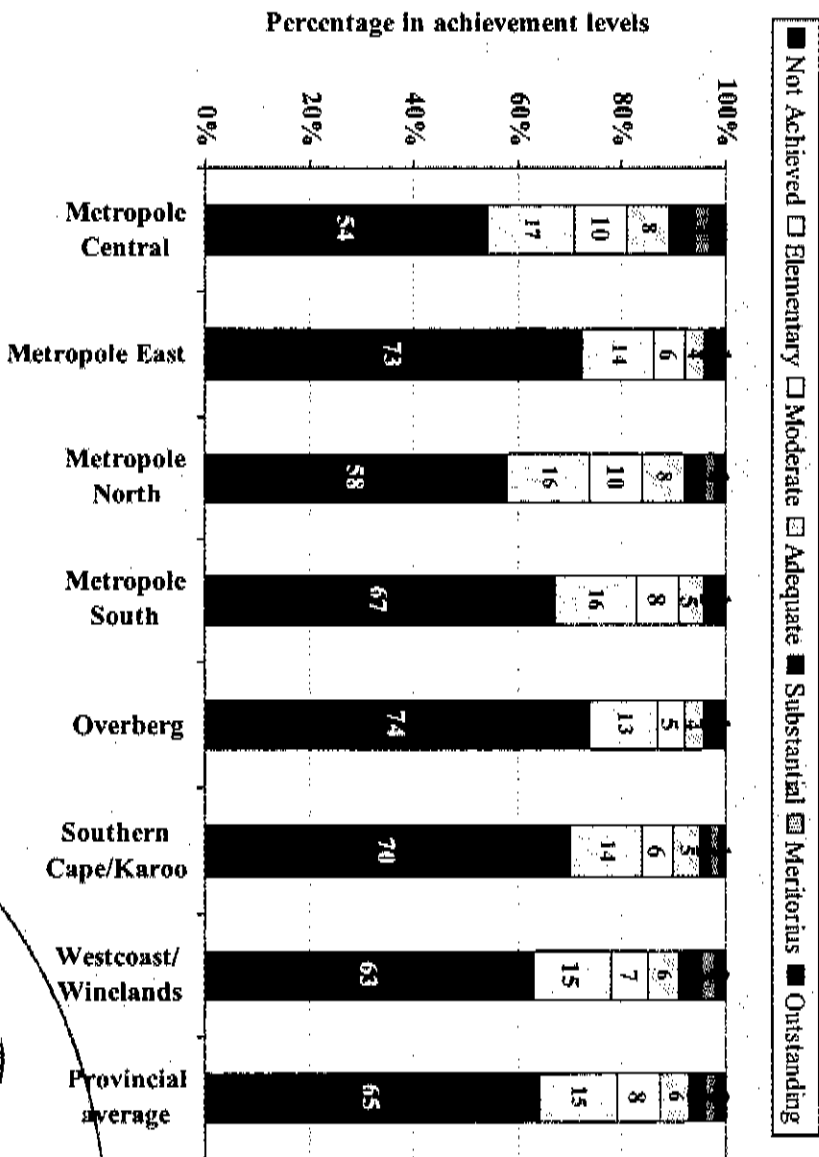


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Education Services and Skills Development

Mathematics performance by achievement level and EM

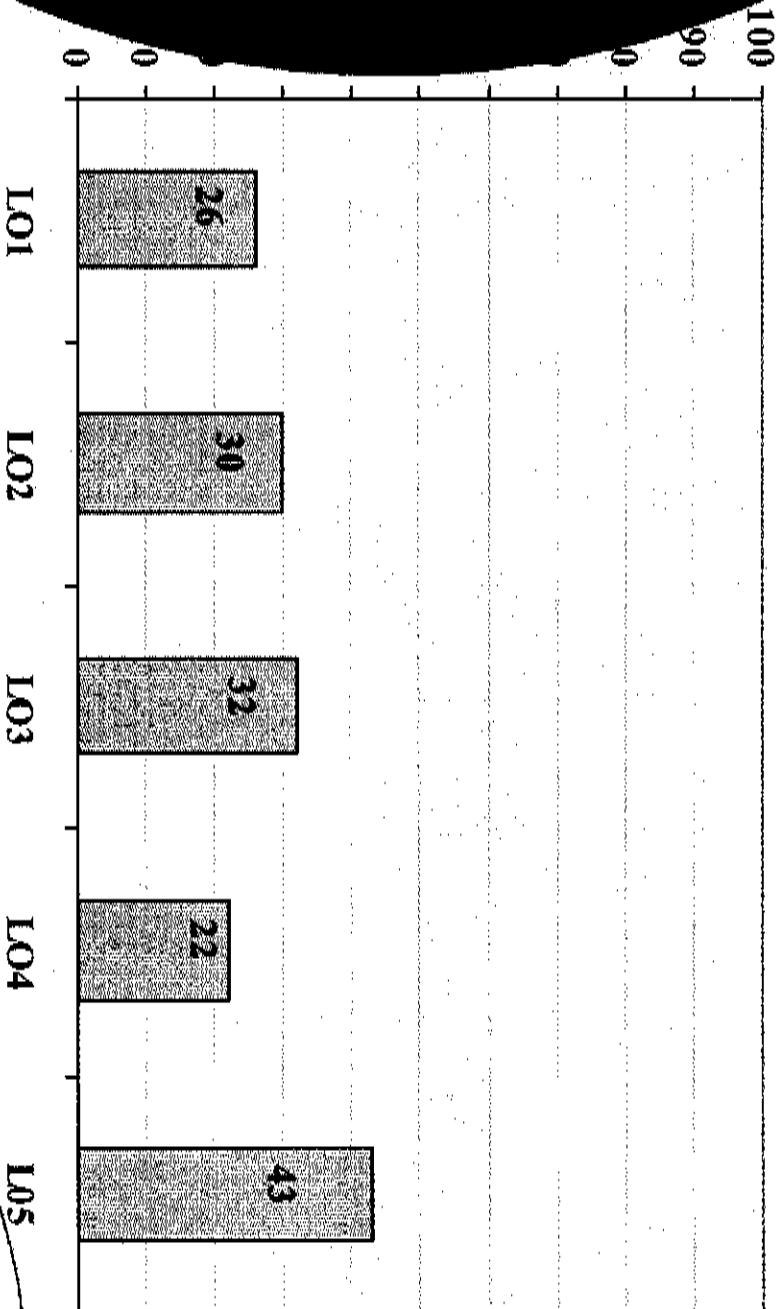


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Mathematics performance by LO



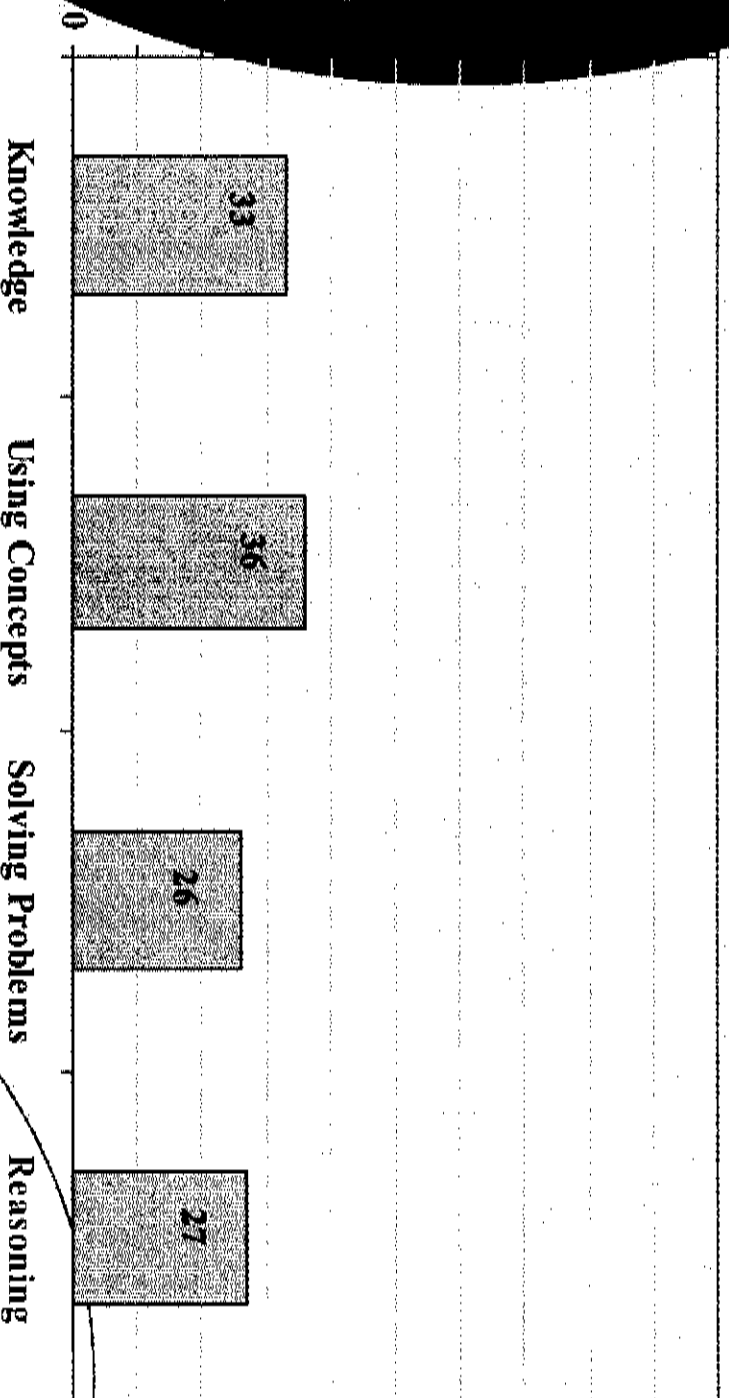
Mathematics Learning Outcomes

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Mathematics performance by Cognitive Domain

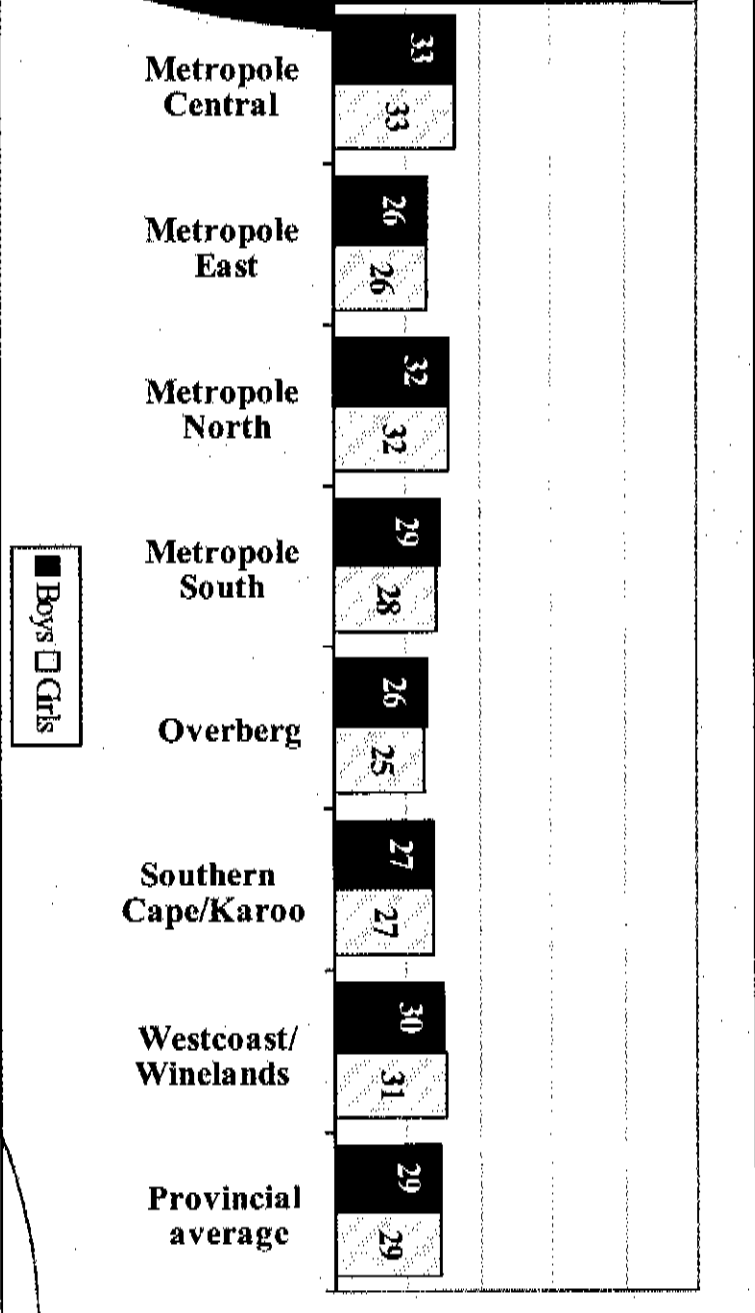


Mathematics Cognitive Domain
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Mathematics performance by gender and EMDC

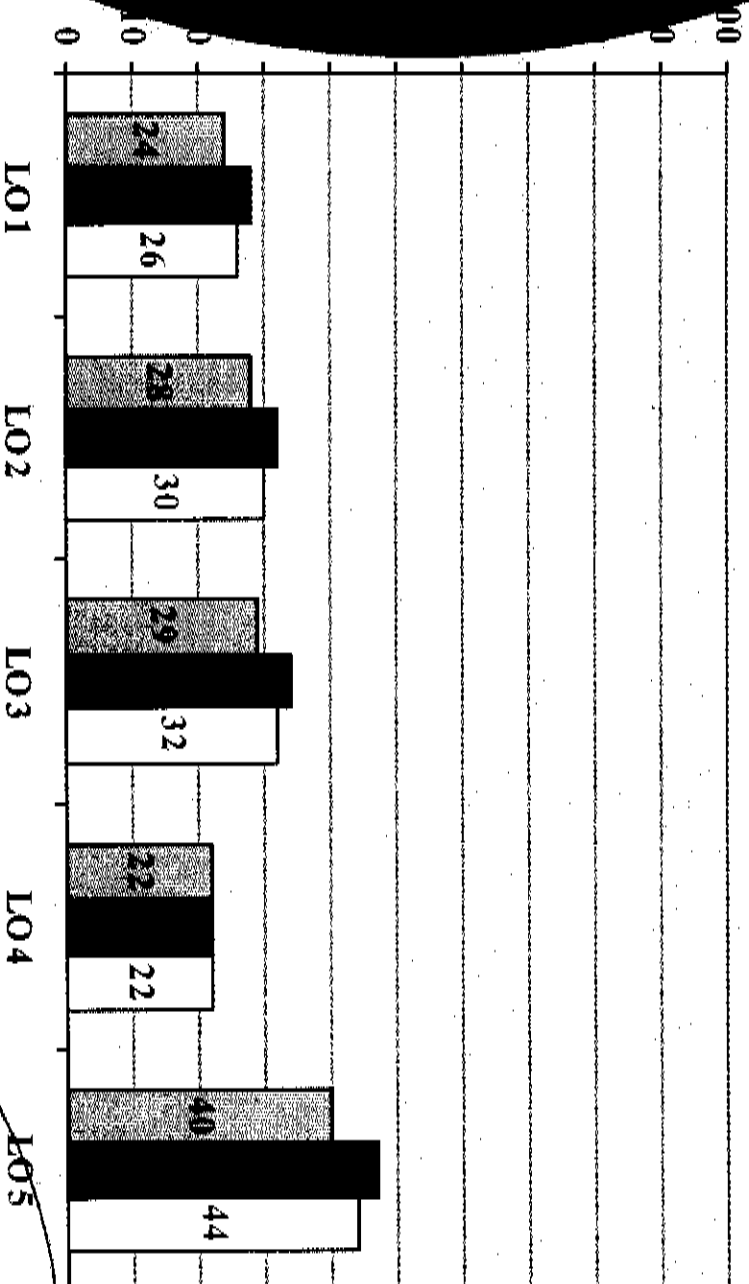


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Mathematics performance by LOLT and LO



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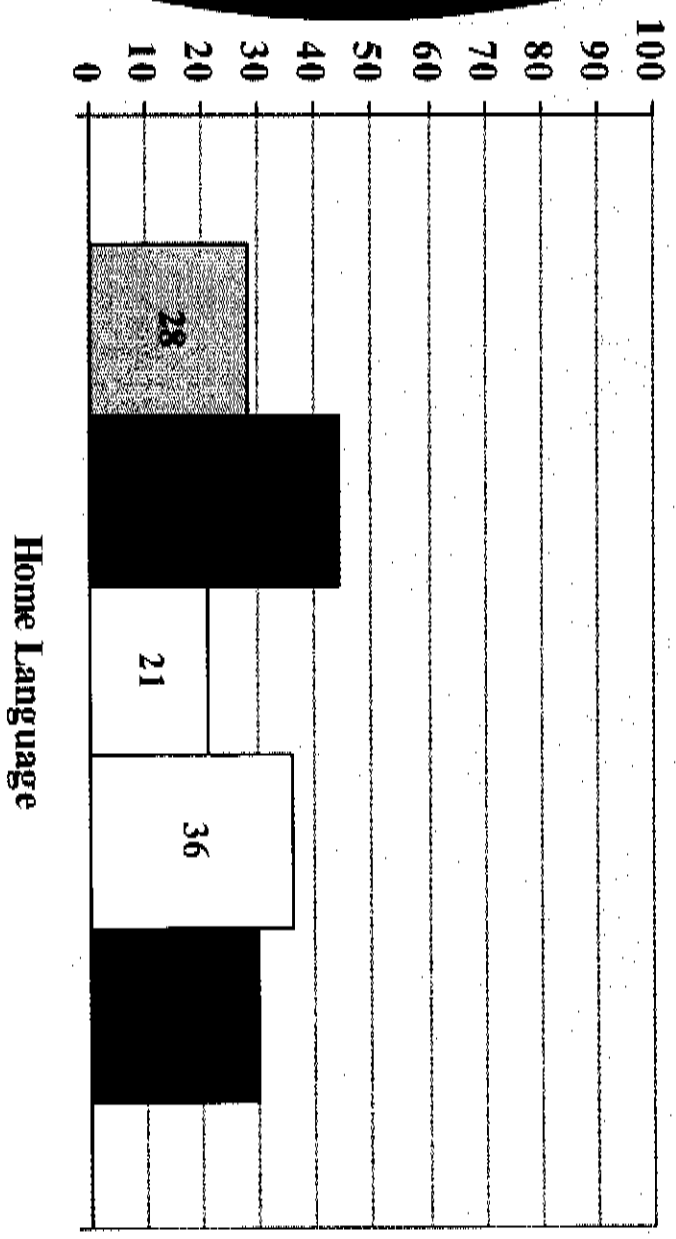
■ Afrikaans ■ English □ Total



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Mathematics performance across the home languages

Mathematics Performance by Home Language



- Afrikaans
- English
- Xhosa
- Other
- Total

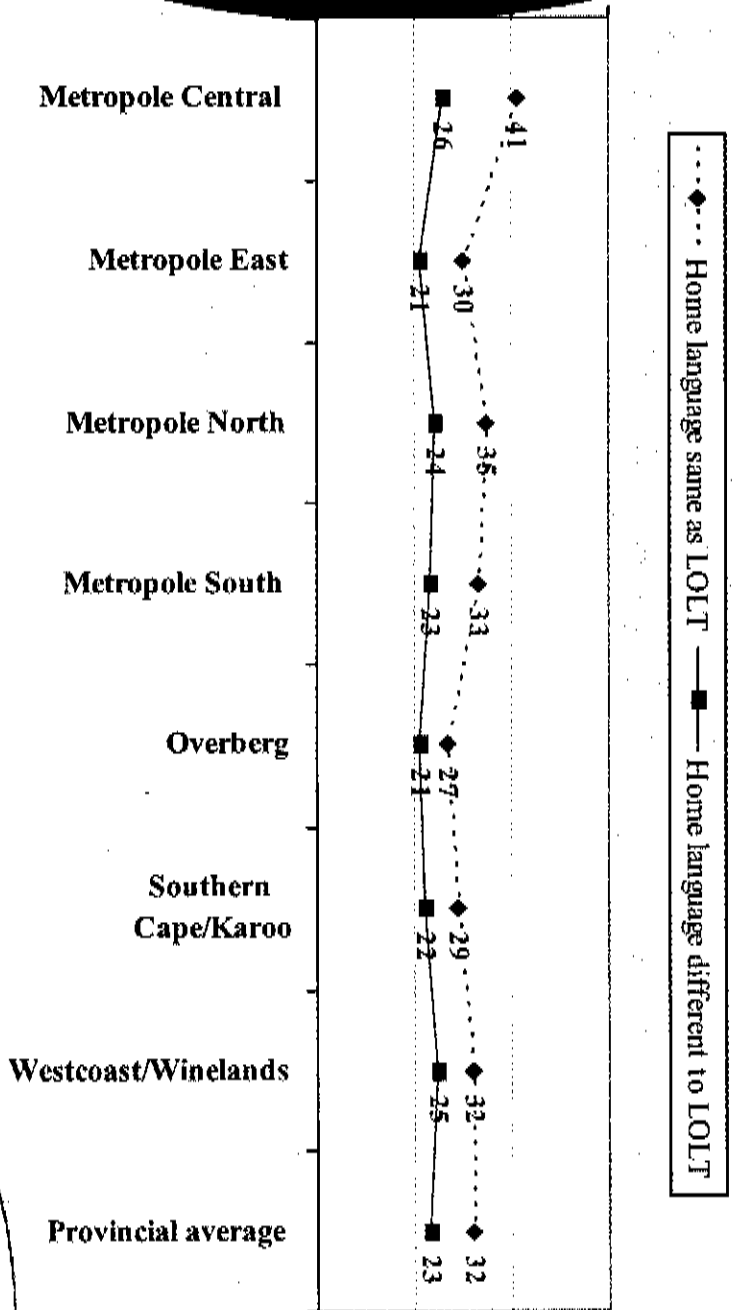
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Education, Employment and Skills Development

Mathematics achievement between home language and LoLT



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Percentages of mathematics learners using translations

		Afr	Eng	Xhosa	Other	Total
Yes	%	60	75	81	72	61
No	%	40	25	19	28	39
Yes	%	57	22	79	40	48
No	%	43	78	21	60	52

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Numbers of maths learners benefiting from the translations

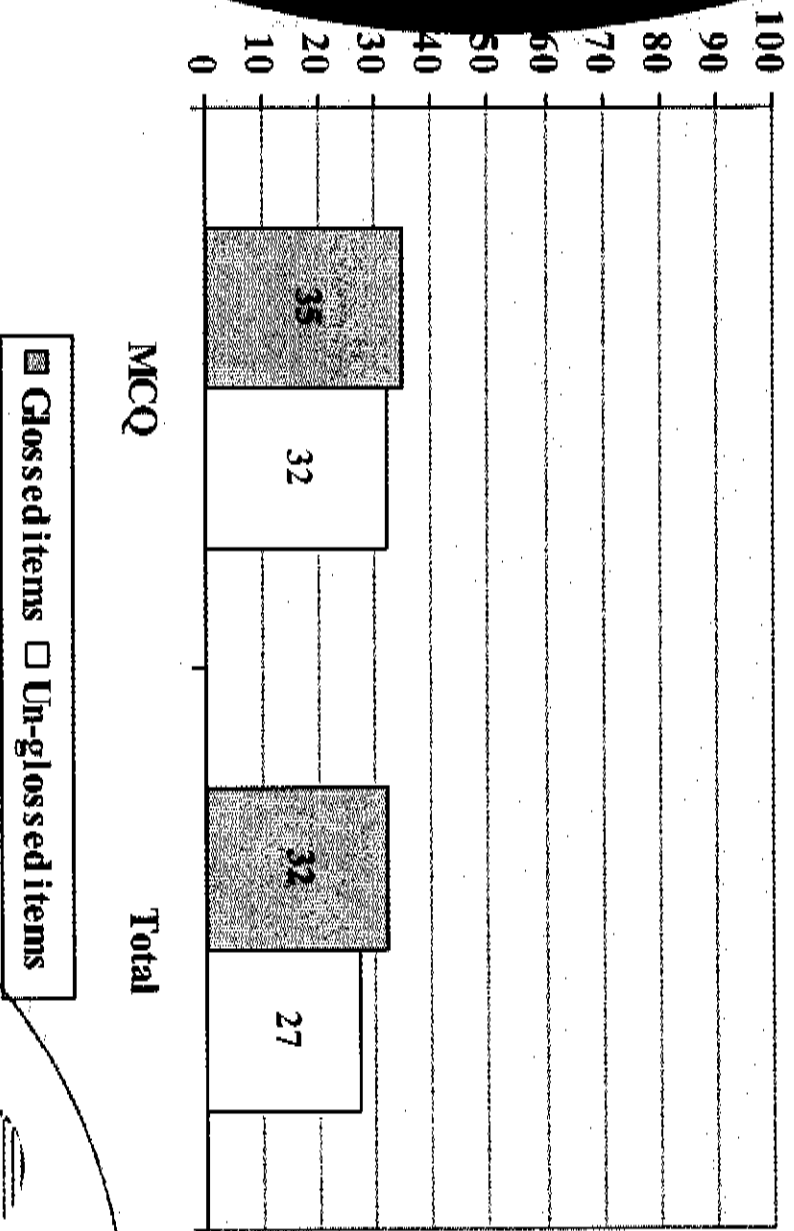
		Afr	Eng	Xhosa	Other	Total
Yes	%	85	81	80	90	85
No	%	15	19	20	10	15
Yes	%	85	81	88	89	87
No	%	15	19	12	11	13

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Performance in glossed and un-glossed mathematics items

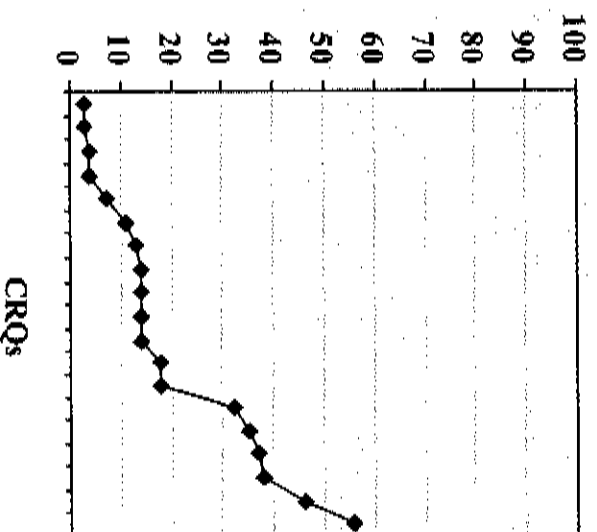
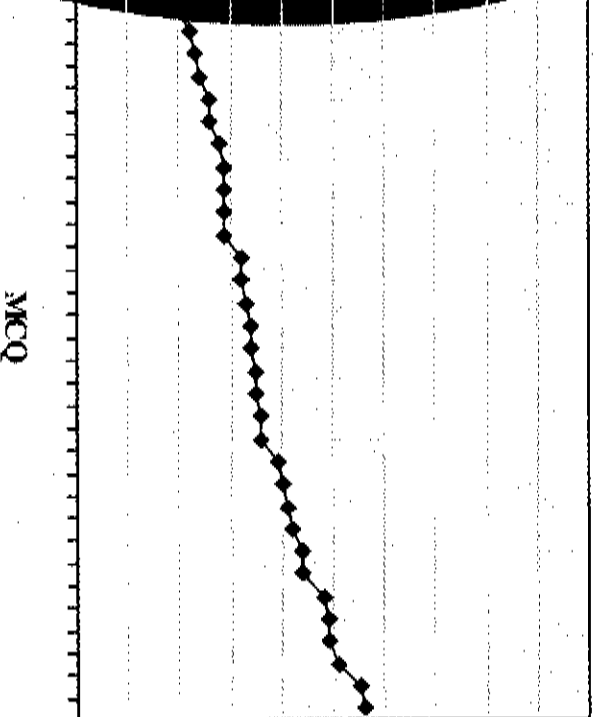


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Percentages of learners that got each individual items correct per item type

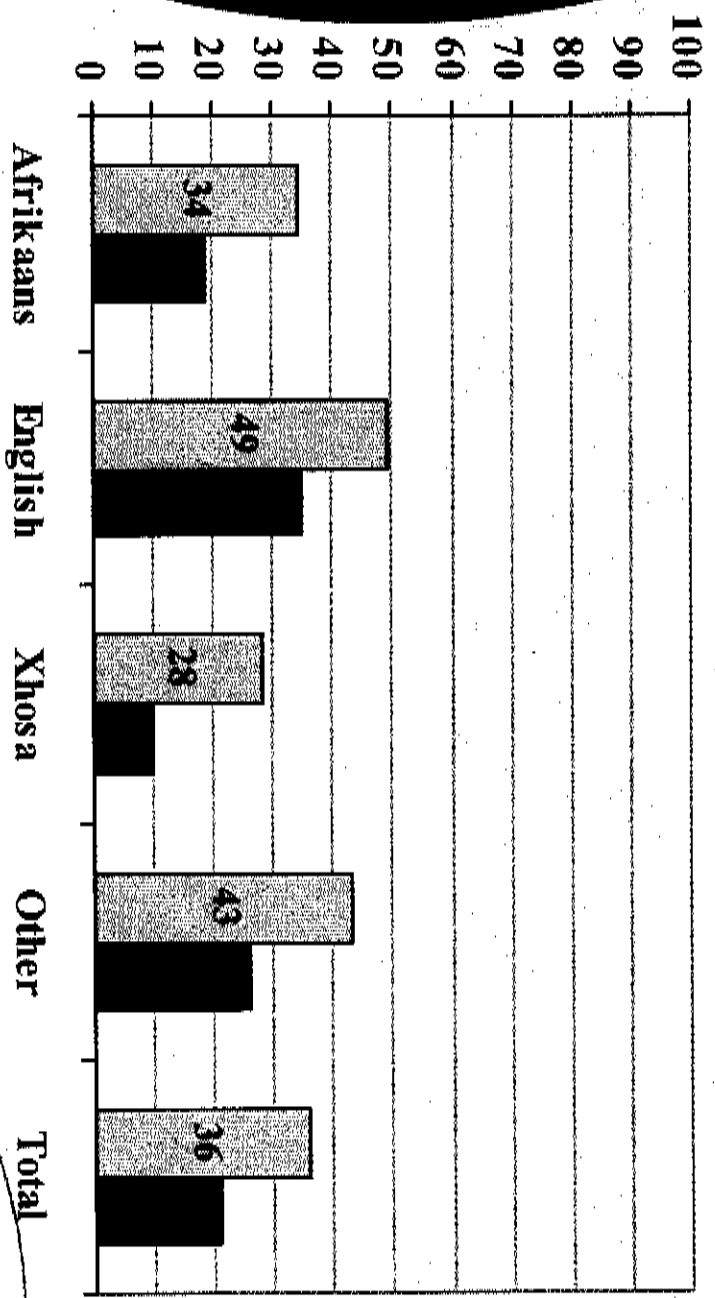


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Mathematics performance by item type and home language

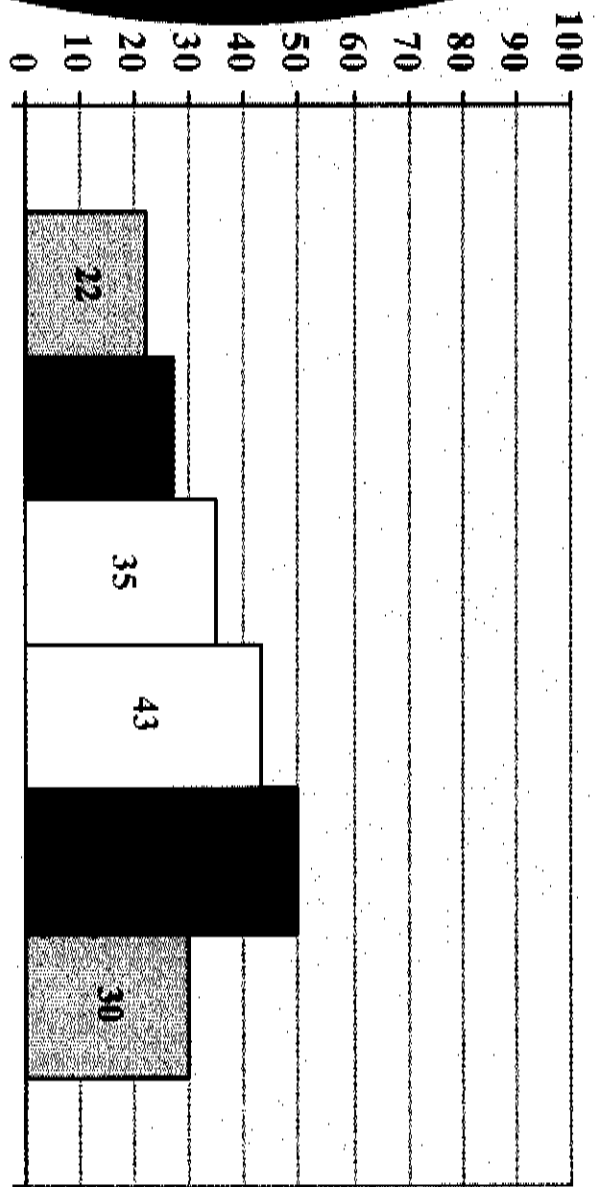


■ MC ■ CR

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Mathematics Performance by the Number of Books in the Home

Mathematics performance by the number of books in the home



None
 1 - 20
 21 - 50
 51 - 100
 More than 100
 Total

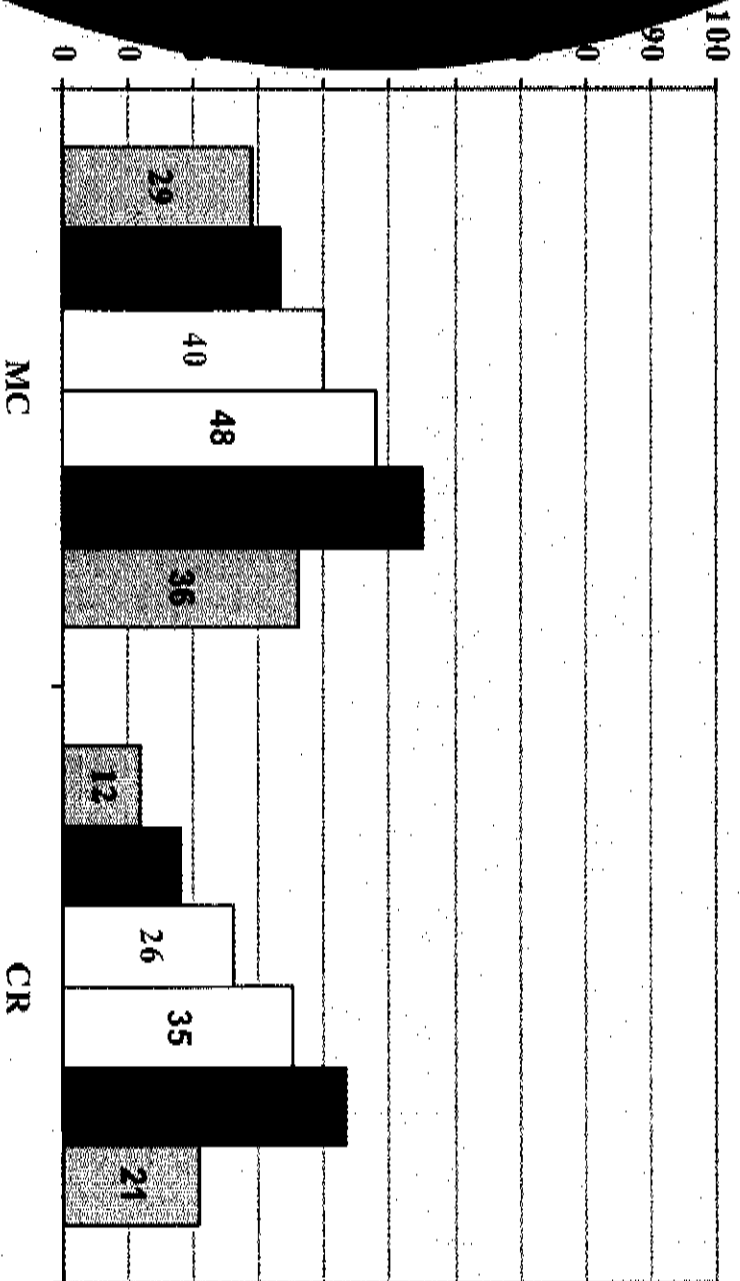
Number of books in the home

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Mathematics performance by the number of books and item type



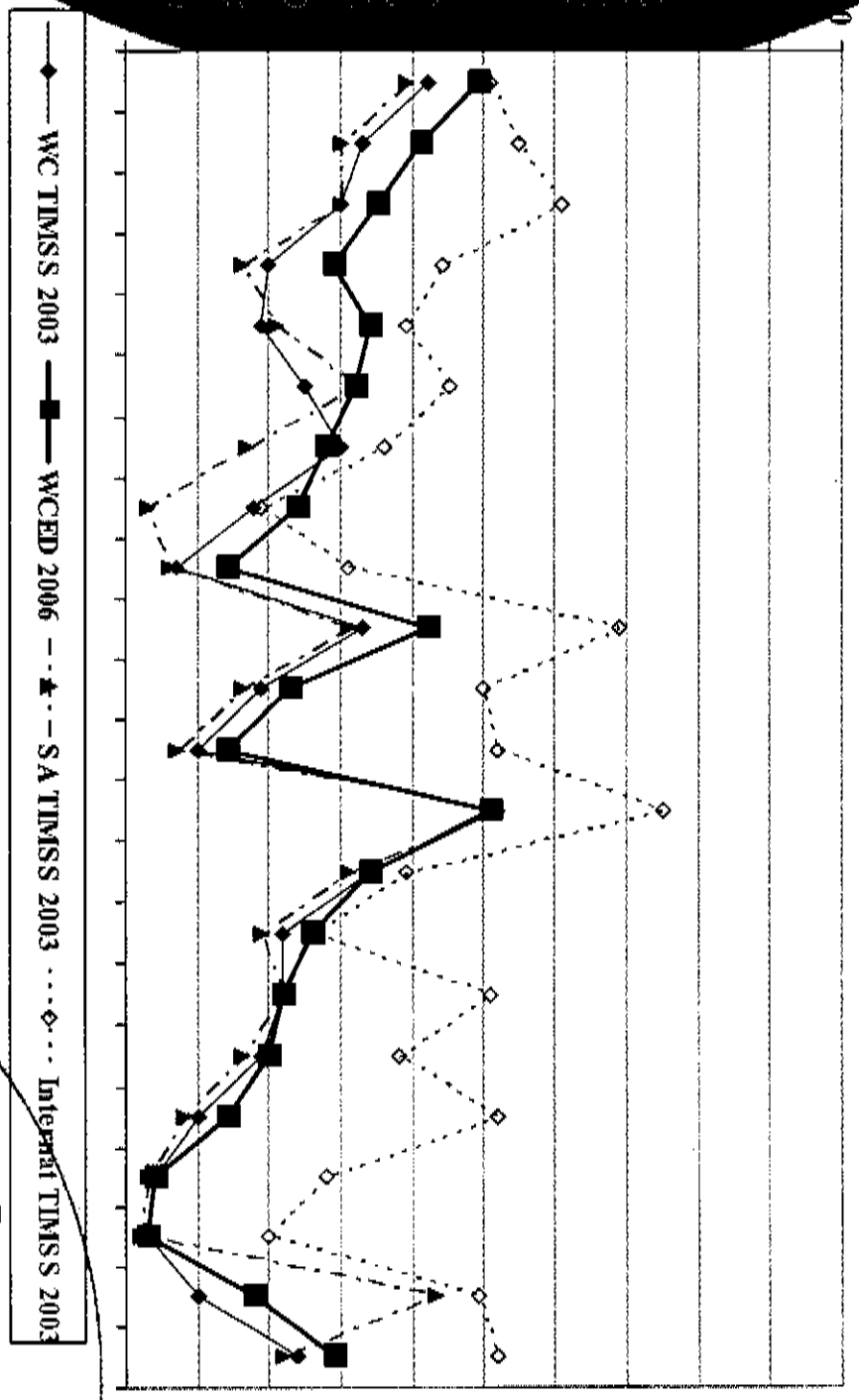
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Education, Science and Skills Development

Comparison of items included in the TIMSS 2003 and 2006 WCED studies



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Examples of learner performance:

Example 1

Which one of the following is equal to $370 \times 998 + 370 \times 2$?

- 370 x 1 000
- 370 x 998
- 340 x 998
- 370 x 998 x 2

Learner Results for
MCQ options

- A. 24.0% ✓
- B. 8.2%
- C. 4.5%
- D. 53.5%

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Examples of learner performance:

Example 2

What is the value of the following expression:

$$1 - 5 (-2)?$$

- A. 11
- B. 8
- C. -8
- D. -9

Learner Results for
MCQ options

- A. 12.4% ✓
- B. 22.6%
- C. 45.4%
- D. 13.4%

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Examples of learner performance:

Example 3

A car has a petrol tank that holds 45 litres of fuel. The car uses 8,5 litres of petrol for each 100 km driven. A trip of 350 km was started with a full tank of petrol. How much petrol **remained** in the tank at the end of the trip?

- A. 15,25 litre
- B. 16,25 litre
- C. 24,75 litre
- D. 29,75 litre

Learner Results for
MCQ options

- A. 26.1% ✓
- B. 24.9%
- C. 23.0%
- D. 17.6%

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Weaknesses/errors revealed through analysis of all mathematics items

Weaknesses/errors (or not achieving the set tasks)	Average % of learners who experienced this problem in the instrument
over in operations with whole numbers	22
correct operation to solve problem	51
late operations in correct order	67
questions correctly	29
complete answering	36
ability to work with negative numbers	75
Confusion with place value that makes a difference	39

Education, Skills and Skills Development

KEY FINDINGS

- LoLT affect learner performance in all LO
- Performance in MC items higher than for CR items
- Number of book in home increase performance
- Performance in basic mathematical knowledge and skills is low (including numerical skills)
- Performance improved slightly compared to the 2003 TIMMS results
- Performance still below international standards
- More than 80% reported that they benefited from glossed translations

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RECOMMENDATIONS

- Pay special attention to the attainment of basic knowledge and skills in numbers, operations and relationships (LO1)
- Limit the use of MC items and extend the use of constructed-response items assessment.
- Insist that learners show the procedures followed and explain their reasoning.
- Increase capacity in the use of diagnostic scoring processes.
- Explore strategies to assist learners who are taught through languages other than their home language .
- Increase the number of books available to learners (even at school through reading corners).
- Address weaknesses of poorly performing learners by special programmes developed at Provincial or EMDC level.
- Develop advanced programmes to improve the existing mathematics knowledge and skills of higher performing learners further.

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Education, Youth and
Child Development

Thank you for your time.

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