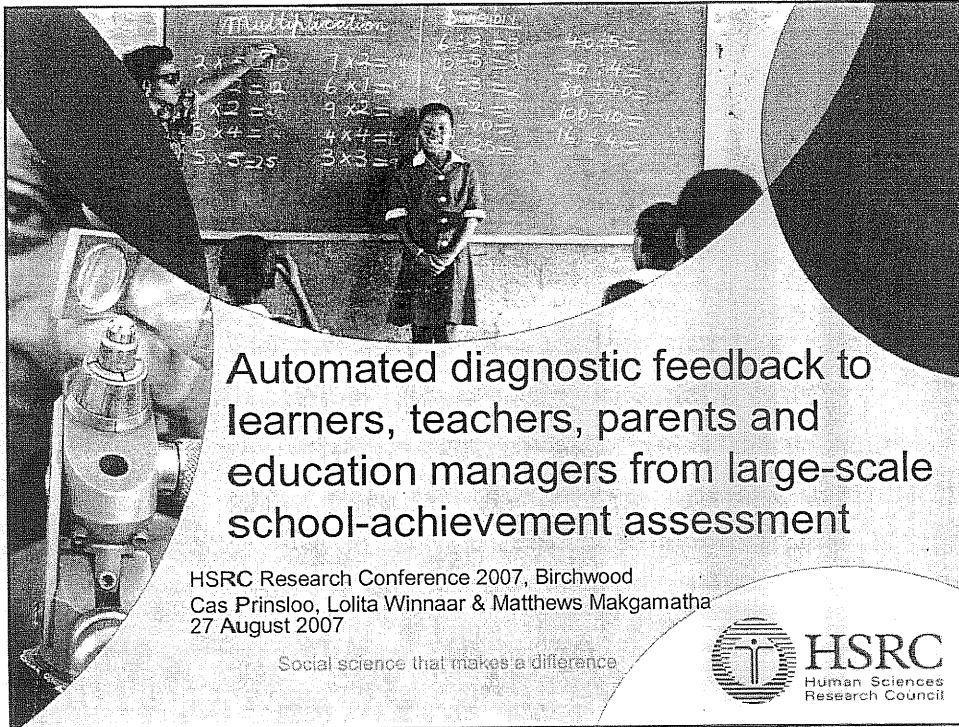


## HSRC RESEARCH OUTPUTS


4844



**Automated diagnostic feedback to learners, teachers, parents and education managers from large-scale school-achievement assessment**

HSRC Research Conference 2007, Birchwood  
Cas Prinsloo, Lolita Winnaar & Matthews Makgamatha  
27 August 2007

Social science that makes a difference



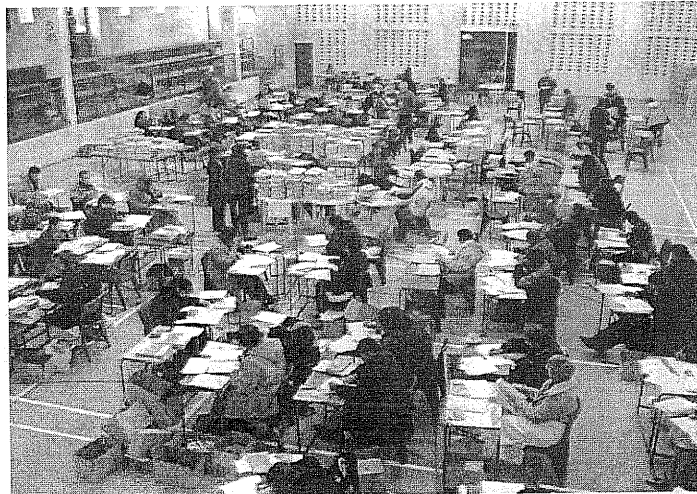
### Data: pre-processing (MMM)

- Required bulk coding of a number of open-ended or constructed responses (←rubrics)
- Established a marking centre (Settlers High)
- Recruited and trained about 150 teachers, to work under about 20 moderators, 6 senior supervisors and 2 quality assurors
- Required a separate logistics leader, about 20 students, and 3 admin support staff
- Processing had to be fitted into 10 days (last week and the weekend either side) of the July school holidays (after 2 of the 3 weeks for teachers on compulsory INSET)

## Data: pre-processing (MMM)

- Had to route 80 000 x 2 scripts to the site from all W-Cape schools and to Pretoria afterwards (over 600 Xerox-sized boxes, correctly labelled)
- Located an excellent facility – gym hall of a well-located big school
- Daily lunches, taxi fees for students
- Cold and wet winter conditions
- Working hours virtually 7 to 7
- Picture gives a better sense

## Coding centre



## Data Capturing and Preparation (LW)

- After constructed responses (CR) had been coded, instruments were sent for capturing
- Two different service providers were selected to capture the two subject areas tested (→ parallel processing)
- The capturers were provided with detailed instructions explaining how individual items should be coded
- Data manager together with research leader met with the capturers to discuss the instructions provided
- 100% verification was required (→ complete double capturing)

## Data Cleaning and Quality Control

- Data cleaning commenced once the data and instruments had been received from the capturers
- The data-cleaning process ensures that all data fall within pre-specified:
  1. formats
  2. field lengths, and
  3. values provided by the HSRC
- And also eliminates, through a digital process, any:
  1. inconsistencies
  2. double records
  3. errors and other anomalies picked up

## Data Manipulation for Analysis

- Once satisfactorily cleaned, all items were scored
- This enables various totals, sub-totals and diagnostic information to be calculated on which analysis is based [E.g., performance levels could not be calculated unless total percentages were created]

Performance level/rating code	Description of rating	Marks in percentages
7	Outstanding performance	80 - 100
6	Meritorious performance	70 - 79
5	Substantial performance	60 - 69
4	Adequate performance	50 - 59
3	Moderate performance	40 - 49
2	Elementary performance	30 - 39
1	Not achieved	0 - 29

- Multiple-choice responses are scored 1 if correct and 0 otherwise

## Terms of reference, and user needs

- To report on all Gr 8 learners (2006), benchmarked @ other countries, with formative comments on trajectories
- Implied and required individual certificates and learner report cards
- Meaningful to: learners (/ parents); teachers; HoDs & Principals (SMTs); EMDCs or Districts; and the Province (Curriculum Directorate)

## Different needs, one process/project

- Automated, bulk processing
- Multiple deliverables / outputs
- Creative separation of output streams
- Various softwares:
  - SAS - scoring, cleaning, edits, calcs
  - SPSS – more calcs and tables
  - MsExcel – Customising narrative comments
  - MsAccess – production of reports / certificates

## Information transferred (2 LAs)

- To province – (sub-)scores by District
- To district – (sub-)scores by school
- To schools – (sub-)scores by learner
- To learners – range of (sub-)scores
  
- [cf. examples of printouts, certificates, and report cards distributed]

## Examples of outputs

- Overall provincial table
- District table
- School table
- Learner results:
  - certificates
  - report cards

## Concluding remarks

- Extremely worthwhile client engagement (#)
- Excellent “laboratory” conditions for learning more about performance reporting, etc
- Vast and rich data (note – CEMIS interface)
- Extremely taxing admin/logistical components dwarf or shadow research effort and benefits
- Difference in foci: DoE - reporting & value at individual learner level; HSRC - sample-based study of reporting systems, systemic performance levels, & teacher empowerment
- # MEC, WCED Mgmt team, Curric Advisors
- Research-wise not worth it as annual project

(a)

EXAMPLE OF LOOK-UP TABLE

Level	Descriptor	A LP1Lv	A LP1Ct	B LP2Lv	B LP2Ct
1 Not achieved			The learner requires urgent assistance with reading and writing at school and home and within the community.		The learner requires urgent assistance with reading and writing at school and home and in the community.
2 Elementary			The learner needs assistance and regular reading practice to improve literacy skills without delay.		The learner should read newspapers and non-fiction to improve literacy for subjects across the curriculum.
3 Moderate			The learner should focus on reading widely to build the literacy skills needed in secondary education.		The learner should focus on reading newspapers and non-fiction to build the reading skills needed in secondary education.
4 Adequate			The learner should read widely to develop the language skills needed in secondary and tertiary education.		The learner should read newspapers and non-fiction to develop the academic literacy needed in further education.
5 Substantial			The learner should read widely to strengthen the language skills needed in secondary and tertiary education.		The learner should read non-fiction to strengthen academic literacy skills needed in secondary and tertiary education.
6 Meritorious			Good performance predicts high-level academic literacy in tertiary education and compares well internationally.		Good performance predicts high-level academic literacy in tertiary education and compares well internationally.
7 Outstanding			Excellent performance predicts high-level academic literacy in tertiary education and compares well internationally.		Excellent performance predicts high-level academic literacy in tertiary education and compares well internationally.

(b)

C LFRLV	C LFRct	D MCSLV	D MCSCt	E MFRLV
	The learner is barely able to write at sentence level and requires urgent educational assistance.		The learner requires urgent assistance in order to apply knowledge and skills in everyday situations.	
1	The learner needs regular practice and assistance with writing logical sentences and paragraphs.	1	The learner requires assistance in order to apply knowledge and skills in everyday situations.	1
2	The learner is advised to practice various writing tasks regularly with assistance where possible.	2	The learner should be assisted to apply mathematical skills regularly in order to learn how to transfer knowledge to new tasks.	2
3	The learner is advised to develop the necessary level of writing skills for further education.	3	Mathematical skills should be applied regularly in order to learn how to transfer knowledge to new tasks.	3
4	The learner has the ability to develop even stronger and more logical writing skills.	4	Existing competence should be strengthened through regular practice with new and complex mathematical tasks.	4
5	The learner is able to produce logical and clearly written texts at a very high level.	5	Existing high-level competence could be strengthened through regular practice with complex mathematical tasks.	5
6	The learner is able to produce logical and clearly written texts at an exceptional level.	6	The learner applied mathematical knowledge and skills successfully in complex situations.	6
7		7		7



(c)

E MFRct	F MTtLV	F MTtCt
<p>The learner is barely able to communicate mathematical ideas and requires urgent assistance in practicing these skills.</p>	<p>The learner needs urgent assistance in order to acquire basic mathematical knowledge and skills.</p>	
<p>The learner struggles to communicate mathematical ideas and requires assistance in practicing these skills.</p>	<p>1 The learner should be assisted without delay to improve basic mathematical knowledge and skills.</p>	
<p>The ability to communicate mathematical ideas should be improved without delay through the regular use of reasoning and procedures.</p>	<p>2 The learner should focus on basic knowledge and skills in order to develop the expertise needed for secondary education.</p>	
<p>Communication of mathematical ideas should be improved through the regular use of reasoning and procedures.</p>	<p>3 The learner should strengthen proficiency in the areas of Mathematics where basic knowledge and skills are lacking.</p>	
<p>High communication skills in Mathematics could be strengthened through the regular use of reasoning and procedures.</p>	<p>4 The learner should practice mathematical knowledge and skills regularly to meet the demands of secondary and tertiary education.</p>	
<p>The learner has a high ability to communicate mathematical ideas and procedures.</p>	<p>5 This very good performance predicts high-level academic achievement at secondary and tertiary level.</p>	
<p>The learner's ability to communicate mathematical ideas and procedures is exceptional.</p>	<p>6 This exceptional performance predicts high-level academic achievement in Mathematics and related study fields.</p>	<p>7</p>



### Comparison of Mathematics Mean Scores - By EMDC

Mean

District	Maths Total Score : Percentage	Maths Achievement Level 7-point Scale	Maths: Multiple Choice Total Score : Percentage	Maths: Constructed Response Percentage	Maths LO1 : Num Operations & Relations : Percentage
Metro Central	32.83	2.18	38.30	23.71	28.86
Metro North	31.37	2.05	36.82	22.30	27.36
Metro East	25.44	1.58	31.48	15.38	23.38
Metro South	27.48	1.71	33.29	17.80	25.00
Overberg	25.10	1.55	30.80	15.61	22.42
Southern Cape/ Karoo	26.96	1.68	32.89	17.08	24.03
Westcoast/ Winelands	30.25	1.95	35.71	21.14	26.69
Total	28.61	1.82	34.30	19.13	25.51

### Comparison of Mathematics Mean Scores - By EMDC

Mean

District	Maths LO2 : Patterns Functions & Algebra : Percentage	Maths LO3 : Space and Shapes : Percentage	Maths LO4 : Measurement : Percentage	Maths LO5 : Data Handling : Percentage	Knowing Facts and Procedures : Percentage
Metro Central	34.31	36.80	24.26	51.30	37.42
Metro North	32.46	35.70	23.48	48.81	35.71
Metro East	27.41	27.15	19.07	37.72	29.52
Metro South	28.98	30.28	19.88	42.11	32.15
Overberg	26.46	27.12	19.92	37.38	29.19
Southern Cape/ Karoo	28.62	29.52	21.20	39.66	31.48
Westcoast/ Winelands	31.56	33.38	23.17	46.57	34.23
Total	30.08	31.59	21.58	43.63	32.94

### Comparison of Mathematics Mean Scores - By EMDC

Mean

District	Using Concepts : Percentage	Solving Routine Problems : Percentage	Reasoning : Percentage	Glossed Items : Percentage	Unglossed Items : Percentage
Metro Central	40.52	29.85	31.92	35.89	31.66
Metro North	39.50	28.53	29.40	34.49	30.15
Metro East	32.11	23.02	23.08	29.39	23.54
Metro South	34.07	24.75	25.77	31.13	25.83
Overberg	31.67	23.10	21.70	28.55	23.53
Southern Cape/ Karoo	33.47	24.75	24.11	30.63	25.25
Westcoast/ Winelands	38.23	27.68	27.89	33.30	29.04
Total	35.81	26.04	26.45	32.03	27.12

English Language Mean Scores for Schools in Metro East EMDC<sup>a</sup>

Mean

School	Language Total Percentage	Language Achievement Level 7-point Scale	Multiple Choice Total Percentage	Constructed Response Percentage	Part 1 Percentage (HL)	Part 2 Percentage (LOLT)	Grade 6 Item Percentage	Grade 7 Item Percentage
BE	38.75	2.50	43.18	33.59	44.53	33.84	41.58	43.67
SE								
BL	31.17	1.82	36.24	23.68	36.26	26.84	35.82	36.33
BF	48.18	3.47	54.03	41.65	51.07	45.72	56.40	55.60
DE	43.07	2.95	48.18	36.67	49.57	37.54	47.61	48.52
EE	38.89	2.50	43.86	32.23	44.04	34.52	39.87	46.31
ES	21.62	1.00	26.09	14.29	26.47	17.50	11.11	5.56
FC	30.20	1.70	34.96	22.83	36.96	24.46	33.63	36.86
KV	24.77	1.00	31.88	13.10	25.49	24.17	29.63	35.19
LL	22.43	1.10	28.26	13.57	26.18	19.25	25.56	25.56
M/	37.14	2.39	40.93	32.38	43.37	31.85	39.39	42.00
MC	38.43	2.43	43.67	31.47	43.13	34.44	43.61	42.01
SA	37.19	2.35	41.53	31.45	42.87	32.35	42.00	42.47
SC	29.65	1.69	34.78	21.53	36.39	23.93	35.24	34.76
UX	14.8649	1.00	18.4783	8.9286	19.1176	11.2500	22.2222	22.2222
WI	23.6486	1.00	20.6522	28.5714	45.5882	5.0000	33.3333	25.0000
TU	33.3496	2.05	37.4582	27.7473	38.7676	28.7443	33.4842	37.8834
KU	31.4785	1.88	36.7008	23.8445	35.7266	27.8676	35.9477	38.8889
TE								
W/	25.6757	1.50	32.6087	16.0714	23.5294	27.5000	11.1111	19.4444
SA	14.1892	1.00	18.4783	7.1429	17.6471	11.2500	33.3333	19.4444
CH	25.6757	1.25	33.6957	12.5000	27.9412	23.7500	30.5556	29.1667
SN	20.0450	1.00	26.2681	9.8214	21.3235	18.9583	34.2593	26.3889
HC	10.8108	1.00	10.8696	10.7143	20.5882	2.5000	.0000	11.1111
HC	45.2327	3.13	49.2150	42.3280	50.5991	40.6713	49.0741	50.9774
HS								
PA	60.6016	4.68	66.6199	55.7373	65.0474	56.8226	70.8244	69.5341
RU	29.4884	1.71	34.2391	22.3214	33.4034	26.1607	34.1270	33.5317
ST	62.1622	5.00	69.5652	53.5714	67.6471	57.5000	77.7778	72.2222
ST	24.3243	1.00	36.9565	3.5714	29.4118	20.0000	44.4444	27.7778
SII	14.5270	1.00	19.2935	6.6964	15.8088	13.4375	19.4444	18.0556
Total	39.5162	2.62	44.3264	33.5796	44.7337	35.0814	43.7491	45.3136

English Language Mean Scores for Schools in Metro East EMDC<sup>a</sup>

Mean



School	Grade 8 Item Percentage	Learning Outcome 3 (Reading) Percentage	Learning Outcome 4 (Writing) Percentage	Learning Outcome 5 (Reasoning) Percentage	Learning Outcome 6 (Language Structure) Percentage	High Incidence 99,97,96,01, 11: All CR Items Total	Part 1 Section B (Common) Percentage
BE	39.29	37.02	34.31	41.22	27.41	2.44	52.48
SE							
BL	31.14	29.75	24.34	34.53	20.13	4.17	41.97
BF	46.38	48.07	41.10	50.52	32.22	1.85	52.46
DE	43.02	42.19	37.04	47.96	29.29	2.15	51.81
EE	38.82	37.77	32.32	42.08	26.55	3.08	48.91
ES	27.45	19.35	15.38	24.39	11.36	7.00	40.00
FC	30.39	28.86	23.54	34.15	18.58	4.45	41.49
KV	22.22	24.73	14.10	30.08	12.88	3.00	30.00
LU	23.33	21.45	14.62	25.85	12.27	6.20	32.00
MF	37.39	35.38	33.07	39.50	26.15	3.19	50.97
MC	38.53	37.48	32.31	41.71	25.43	2.86	48.88
SA	37.30	35.89	31.84	40.82	25.73	2.40	48.22
SC	29.80	28.62	22.31	34.29	18.77	5.03	39.71
UX	11.7647	13.7097	9.6154	14.6341	9.0909	4.00	25.00
WI	27.4510	16.9355	30.7692	19.5122	19.3182	4.50	70.00
TU	33.9721	31.3458	28.5242	35.8349	22.6142	3.33	48.82
KL	31.2572	30.2657	23.7557	34.2181	19.7193	4.38	42.35
TE							
W/	28.4314	25.0000	17.3077	29.2683	19.3182	3.50	35.00
SA	11.7647	13.7097	7.6923	15.8537	4.5455	6.50	20.00
CF	27.4510	25.8065	13.4615	29.8780	11.9318	5.75	27.50
SI	18.6275	20.1613	10.5769	23.7805	10.2273	7.08	22.50
HC	11.7647	8.0645	11.5385	12.1951	6.8182	8.00	30.00
HC	44.9346	43.7724	42.8063	46.9061	32.3864	2.38	56.20
HS							
PA	58.1278	61.1655	55.1613	62.9583	41.8328	1.24	60.97
RL	30.6723	27.7650	22.8022	33.4495	19.7240	3.79	41.79
ST	58.8235	58.0645	57.6923	58.5366	40.9091	.00	80.00
ST	21.5686	27.4194	3.8462	29.2683	2.2727	8.00	10.00
SI	14.2157	14.3145	7.2115	16.7683	7.6705	8.00	18.75
Total	39.2858	38.3873	33.9547	42.4696	26.8359	2.93	49.63

a. New 5-way data split for report cards = English

File Edit View Insert Format Tools Window Help

Report

Report Header  
Page Header  
Detail

				DELEARN DSCHOOL
<p><i>The Western Cape Education Department and the Human Sciences Research Council hereby certify that</i></p>				
<p><i>=StrConv([STUNAME],3)</i></p>				
<p><i>from</i></p>				
<p><i>=StrConv([SchName],3)</i></p>				
<p><i>participated in the 2006 Grade 8 Learner Assessment with the following outcome</i></p>				
		Language (English): =before_value_af_(LTL3)		
		Mathematics: =before_value_af_(MTLv1)		

Report

Format: Data | Event | Other | All

Record Source: Data Eng Rounded

Filter: No

Order By On: No

Criteria: Data Eng Rounded

Record Locks: No Locks

Auto Release: Yes

Auto Center: Yes

Page Header: All Pages

Page Footer: All Pages

Tools

Print, Save, Undo, Redo, Find, etc.



**HSRC**  
Human Sciences  
Research Council

1860011020105

1102

*The Western Cape Education Department and the  
Human Sciences Research Council hereby certify  
that*

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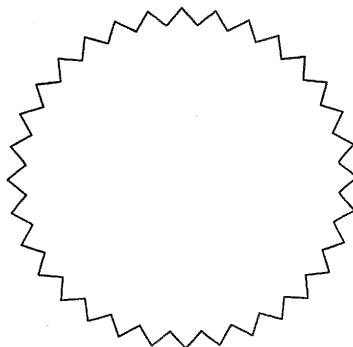
*participated in the 2006 Grade 8 Learner  
Assessment with the following outcome*

*Language (English): Merit*

*Mathematics: Merit*

---

*Ronald B Swartz  
Superintendent-General  
Western Cape Education Department*



---

*For: Dr Olive Shisana  
President and Chief Executive Officer  
Human Sciences Research Council*



**Schools' Assessment Task Results -- 2006 -- Language and Mathematics  
GRADE 8 -- LEARNER REPORT CARD**

Learner name: A

School name: ( 1102 ) AL

I SEC.

1860011020002

Language	Provincial average (%)	Average for English HL learners (%)	Learner's achievement		Diagnostic comment (See key below)
			%	Description	
Home Language section	38	44	53	Adequate	The learner should read widely to develop the language skills needed in secondary and tertiary education.
English Language of Learning and Teaching (LOLT) section	27	35	38	Elementary	The learner should read newspapers and non-fiction to improve literacy for subjects across the curriculum.
Answers (written) to open-ended questions (from both sections above)	24	33	29	Not achieved	The learner is barely able to write at sentence level and requires urgent educational assistance.
<b>Total for Language</b>	<b>32</b>	<b>39</b>	<b>45</b>	<b>Moderate</b>	

Mathematics	Provincial average (%)	Learner's achievement		Description of achievement level and diagnostic comment (See key below)
		%	Description	
Basic mathematical knowledge	33	53	Adequate	
Solving problems	26	32	Elementary	The learner requires assistance in order to apply knowledge and skills in everyday situations.
Open-ended (constructed) answers	19	14	Not achieved	The learner is barely able to communicate mathematical ideas and requires urgent assistance in practicing these skills.
<b>Total for Mathematics</b>	<b>29</b>	<b>34</b>	<b>Elementary</b>	The learner should be assisted without delay to improve basic mathematical knowledge and skills.

Note: An empty cell or "N/A" (not applicable) in a cell means that a learner only wrote one test, or that different report cards contain the feedback for the two tests (e.g., names unclear).

**Key to the Achievement Levels described in the National Curriculum Statement:**

Not achieved (1)      Elementary (2)      Moderate (3)      Adequate (4)      Substantial (5)      Meritorious (6)      Outstanding (7)

Below 30%      30%-39%      40%-49%      50%-59%      60%-69%      70%-79%      80% or above