Detailed indicator report for the basic education sector

basic education

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the basic education sector

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HIGH LEVEL SUMMARY

Introduction

This report provides an update on key indicators of the 2010 Delivery Agreement for the basic education sector. In particular, it provides a detailed analysis in relation to three key indicators, dealing with access to texts, curriculum coverage and district support, where previously there had been a serious knowledge gap. Filling this gap, at least to some degree, has been made possible by the data collected in the 2011 School Monitoring Survey (SMS) of the Department of Basic Education (DBE).

Indicator on access to books

SACMEQ data show that the level of access to books in South African schools has been low by international standards. Analysis of the 2011 School Monitoring Survey data indicates that in 2011 this situation still prevailed, though it appears to have been alleviated to some degree by the availability of national workbooks.

A few key figures illustrate the depth of the problem as it stood at the end of the 2011 school year: In 8% of quintiles 1 to 3 Grade 6 mathematics classes neither a textbook nor a national workbook for the subject could be observed in the classroom by the visiting fieldworker. For Grade 9 mathematics textbooks, the corresponding figure was 21% (in 2011 there were no national workbooks in Grade 9). In general, the access to books situation was worse in Grade 9 than Grade 6. That it should be so common to find mathematics classes within historically disadvantaged schools where not one subject-relevant book could be seen in the hands of learners is obviously cause for concern.

The analysis highlights a few monitoring complexities. For instance, whilst having a fieldworker see actual books is important to counteract dishonest compliance reporting by schools and learners, if a learner does not have a book with him or her on a particular day, this does not necessarily mean that the learner does not generally have access to the required texts. Moreover, what is clear from the 2011 SMS data is that in certain schools an absence of, for instance, textbooks in the hands of learners is not necessarily a problem as teachers may teach through other means. This applies more to historically advantaged schools.

A composite measure of access to books is calculated that gets close to satisfying the requirements of the official indicator.

Indicator on curriculum coverage

New analysis of the 2011 School Monitoring Survey curriculum coverage data is provided which shows, firstly, that the data are useful and should be collected again, with some enhancements, and, secondly, which provinces and aspects of schooling require very urgent attention. The analysis suggests that in virtually all of the system there is a need for more frequent written work by learners and more frequent and informative teacher marking. To illustrate, six or fewer written exercises in mathematics in a month, in both grades 6 and 9, is a reality for around half of learners. This reflects a worryingly low level of effort. In Grade 6 mathematics, around 20% of learners had no teacher marking that could be seen in their exercise books. This reflects an important opportunity. If basic accountability and monitoring in schools can be strengthened, largely through the actions of school principals, then surely the problem of exercise books with no marking by the teacher at all can be eliminated.

GP and WC stand out as provinces with relatively high levels of effort in the classroom, as demonstrated by written exercises in learner books. Yet even in these provinces there are far too many schools where evidence of teacher marking or learner exercises is absent. KN and MP stand out as more rural provinces with relatively high levels of written exercises per month. What stands out as particularly worrying is the low level of classroom effort (in terms of exercises per week) in EC and NW and the particularly poor situation in FS when it comes to the presence and depth of teacher marking.

Indicator on district support services

Nationally, in 2011 96% of schools were visited at least once by the district (or circuit) office, and 88% were visited at least twice. Average visits per year varied by province from 4.6 visits in the case of EC to 10.0 in FS. The least visited schools are those in EC and LP. Very importantly, the more historically disadvantaged a school is, the less it is visited. It should be the other way round. Yet the difference is worrying rather than enormous: average visits per school is 6.1 for quintile 1 against 7.9 for quintile 4.

If one examines school principal levels of satisfaction with district visits, one finds that the poorer the quintile, the lower the level of satisfaction. For instance, 24% of quintile 1 school principal responses are ‘not satisfied’, against 11% in quintiles 4 and 5. If one views this statistic by province, worst are EC and NW with 32% and 29% of responses being ‘not satisfied’, whilst the best provinces are GP and MP (both 9%) and WC (just 4%).

A method for calculating indicator values is presented that takes into account both average level of satisfaction and the number of monitoring and support areas that were covered during district visits. In other words, both satisfaction and comprehensiveness are taken into account. The lowest indicator value seen is that of NW, whilst GP and WC emerge as relatively good performers.

Qualitative responses from school principals indicate that dissatisfaction is often associated with a tendency amongst officials to check compliance in a superficial manner, without due consideration for the complexities of managing a school. Moreover, district officials are often seen as poorly equipped to advise on matters relating to learner behaviour, including drug abuse. This is reported by principals across most, if not all provinces.

1 Introduction

This report provides an update on the indicators of the 2010 Delivery Agreement for the basic education sector. In particular, it provides a detailed analysis in relation to three key indicators, dealing with access to texts, curriculum coverage and district support, where previously there had been a serious knowledge gap. Filling this gap, at least to some degree, has been made possible by the data collected in the 2011 School Monitoring Survey (SMS) of the Department of Basic Education (DBE). This survey involved gathering indicator information from a nationally representative sample of around 2,000 schools. Apart from the three indicators, an update is also provided with respect to a further six indicators appearing in the Delivery Agreement (see the annexure at the end of the report). The current report does not represent an exhaustive use of all the available data. In particular, further information could be extracted from the 2011 SMS dataset. However, the current report can be considered an important step forward for the tracking of key sectoral indicators and improving the knowledge base upon which policy decisions are taken.

2 Issues around the use of indicators

A key element of the government's drive towards better planning and monitoring is more effective use of indicators. This element is less straightforward than one may think. Above all there is a tension between the expectation that progress can be neatly measured using a 'dashboard approach', in the way the vital signs of an aeroplane can be measured from the cockpit, and the reality of incomplete, non-comparable and often biased (incorrect) data. This is a tension that is not unique to South Africa. This report focuses extensively on indicator values and deals with the inevitable tensions as follows:

- As many data sources as possible are considered in order to gain as clear an idea as possible of what true indicator values are. Moreover, data problems that are pertinent for understanding aggregate statistics are discussed in depth. If several data sources point in the same direction, there can be greater certainty around the true values. The discussion of the data problems assists in identifying which data sources are more and less reliable.

- It is acknowledged that what is often more important than the correct indicator values at one point in time, is whether improvement across years is occurring. Thus even if two data sources yield different values, but they both point to an upward movement across years, then this latter pattern warrants special attention from a planning perspective. Clearly from a planning perspective it is vital to break the analysis down by province wherever possible. It is moreover acknowledged that indicators are not only useful with respect to their annual values, but also insofar as they serve as prompts for deeper analysis of the data that can reveal patterns that are important for planners. Some of this deeper analysis is included in this report.

- Analysis of the data often reveals what should improve in future data collections. Recommendations in this regard are included in the report, but with the recognition that improving data collection carries costs that must be weighed against the benefits.

Sixteen indicators comprise the point of departure for this report's discussion on basic education indicators. Some receive more attention than others, depending on data complexities and data availability. The sixteen indicators are those listed as the official indicators for government's Outcome 1 in the relevant indicator Excel file on the Presidency's website[1]. The sixteen indicators are as follows (the numbering links indicators to the outputs and sub-outputs of Outcome 1):

- 1.1.1: Percentage of Grade 3 learners performing at the required literacy level according to the country's Annual National Assessments

- 1.1.2: Average score obtained in Grade 6 in mathematics in the SACMEQ assessment

- 1.1.3: Percentage of Grade 9 learners performing at the required mathematics level according to the country's Annual National Assessments

1 Excel file *Outcome 1 Indicators.xlsx* accessible at http://www.poa.gov.za/Outcome1/Pages/LandingPage.aspx (on 1 January 2012).

- 1.1.4: Number of Grade 12 learners who become eligible for a Bachelors programme in the public national examinations
- 1.1.5: The percentage of teachers who are able to attain minimum standards in anonymous and sample-based assessments of their subject knowledge
- 1.2.1: The percentage of learners having access to the required textbooks and workbooks for the entire school year
- 1.2.2: The percentage of learners in schools with a library or media centre fulfilling certain minimum standards
- 2.1.1: The turnaround time from testing to release of analytical reports
- 2.2.1: The degree to which data from international assessments are used for the planning of in-service teacher development
- 3.1.1: The percentage of Grade 1 learners who have received formal Grade R
- 3.2.1: The percentage of learners having access to the required textbook and workbooks for the entire school year
- 4.1.1: The percentage of learners who cover everything in the curriculum for their current year on the basis of sample-based evaluations of records kept by teachers and evidence of practical exercises done by learners
- 4.1.2: The percentage of schools producing the minimum set of management documents at a required standard, for instance a school budget, a school development plan, an annual report, attendance rosters and learner mark schedules
- 4.1.3: The percentage of learners in schools that are funded at the minimum level
- 4.1.4: The percentage of schools which comply with nationally determined minimum physical infrastructure standards
- 4.2.1: The percentage of school principals rating the support services of districts as being satisfactory

The rest of the report is structured in line with the Delivery Agreement for the basic education sector.

3 Increase access to high quality learning materials

3.1 Indicator on access to books

The full numbering and wording of this indicator is as follows:

1.2.1: The percentage of learners having access to the required textbooks and workbooks for the entire school year

Summary for this indicator

SACMEQ data show that the level of access to books in South African schools has been low by international standards. Analysis of the 2011 School Monitoring Survey data indicates that in 2011 this situation still prevailed, though it appears to have been alleviated to some degree by the availability of national workbooks.

A few key figures illustrate the depth of the problem as it stood at the end of the 2011 school year: In 8% of quintiles 1 to 3 Grade 6 mathematics classes neither a textbook nor a national workbook for the subject could be observed in the classroom by the visiting fieldworker. For Grade 9 mathematics textbooks, the corresponding figure was 21% (in 2011 there were no national workbooks in Grade 9). In general, the access to books situation was worse in Grade 9 than Grade 6. That it should be so common to find mathematics classes within historically disadvantaged schools where not one subject-relevant book could be seen in the hands of learners is obviously cause for concern.

The analysis highlights a few monitoring complexities. For instance, whilst having a fieldworker see actual books is important to counteract dishonest compliance reporting by schools and learners, if a learner does not have a book with him or her on a particular day, this does not necessarily mean that the learner does not generally have access to the required texts. Moreover, what is clear from the 2011 SMS data is that in certain schools an absence of, for instance, textbooks in the hands of learners is not necessarily a problem as teachers may teach through other means. This applies more to historically advantaged schools.

A composite measure of access to books is calculated that gets close to satisfying the requirements of the official indicator.

Detailed analysis

A key data collection exercise conducted at the end of the 2011 that makes much of the analysis in this report possible was the School Monitoring Survey (SMS). This nationally representative sample-based survey of around 2,000 schools occurred towards the end of the 2011 school year, in November. Its aim was largely to fill data gaps in relation to the *Action Plan.* Two fieldworkers visited each school for a whole day. They collected information from various staff members using questionnaires drawn from a set of 13 questionnaires (the number of questionnaires used depended partly on the grades offered in the school). A key element of the school visit was visits to Grade 6 and Grade 9 mathematics and language classes, where the availability of books in the classroom was physically examined and asked about. Importantly, field workers were trained in province-specific training sessions. Reportedly, standardisation across provinces in terms of the methodology of fieldworkers was satisfactory. However, the fact that fieldworkers were trained in province-specific training sessions does increase the probability that slightly different ways of utilising the questionnaires or dealing with irregularities in different provinces occurred.

The final report for the 2011 SMS is titled *Report on the national School Monitoring Survey* and is dated just 2012. It is not available publicly and has been considered problematic by a few people in the DBE because indicator interpretation issues highlighted in section 2**Error! Reference source not found.** of this report seem not to have been adequately dealt with. The current report draws from the final SMS report, but to a large extent the data analysis was redone for this report.

This section provides statistics, with provincial breakdowns, from recent years on learner access to texts.

Before the analysis of the SMS data is discussed, a few trends seen in the 2007 SACMEQ[2] data are examined to provide some background. The SACMEQ sample covered 9,083 Grade 6 learners in 392 schools. The figures in the next table are derived from the following question, posed to the learner: 'How do you use the Mathematics textbooks in your classroom during the lessons?'

Table 1: Grade 6 access to 'mathematics textbook' (SACMEQ 2007)

	No book	Only teacher has book	Share with two or more learners	Share with one learner	Have own book	Total	Textbooks per 100 learners
EC	15	15	17	19	33	100	49
FS	8	10	17	28	37	100	57
GP	10	22	8	27	33	100	49
KN	11	23	16	25	25	100	43
LP	11	15	6	21	47	100	60
MP	8	8	10	21	53	100	67
NC	11	17	9	32	31	100	50
NW	12	12	14	21	41	100	56
WC	4	18	4	27	47	100	62
SA	11	17	12	24	36	100	52

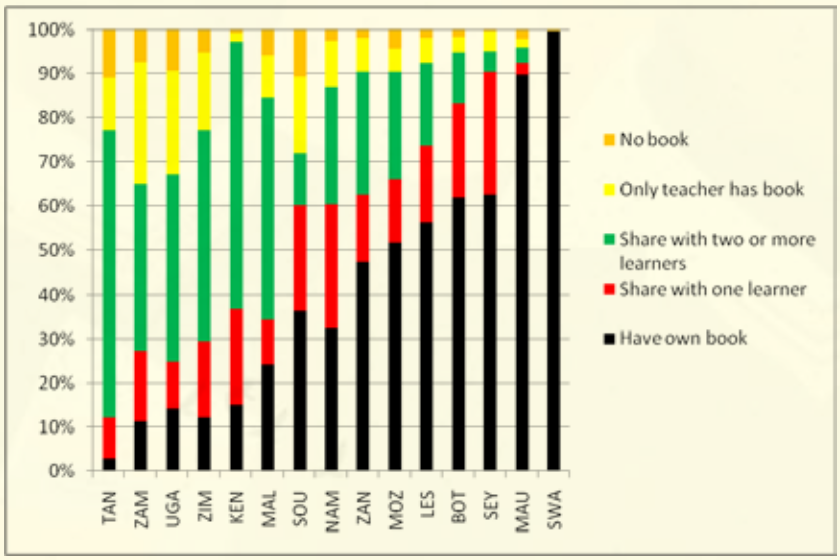
The figures in the final column of Table 1 consider 'Have own book' as 100% coverage, 'Share with one learner' as 50% coverage and 'Share with two or more learners' as 33% coverage (sharing between three is assumed) in order to create a composite idea of the level of access to textbooks. The smallness of the SACMEQ sample at the provincial level means that provincial statistics should be considered rough indications only of the degree of textbook access at that level.

The following graph indicates that South Africa's level of access to mathematics textbooks in 2007 was not good in the regional context. Countries have been sorted in the graph according to estimated textbooks per 100 learners, calculated as described above. To illustrate, this ratio was 77 in Botswana (BWA), against South Africa's (SOU) 52. In Swaziland (SWA), the ratio was 100. Assuming that access to textbooks contributes towards better learning outcomes, improving

2 Southern and Eastern Africa Consortium for Monitoring Educational Quality.

this access to textbooks, or some equivalent materials such as workbooks, appears to be a relatively cost-effective way of addressing South Africa's under-performance challenges.

Figure 1: Access to mathematics textbooks in SACMEQ countries 2007



Turning to the 2011 survey, where there was more than one class per grade the class was randomly selected for the purposes of the visit. There was no requirement that the language and mathematics classes should contain the same learners. Such a requirement would have been impossible in larger schools given that fieldworkers spent just a day in each school and given that there was a requirement that, for instance, the mathematics class visit should occur during the period when mathematics was actually being taught.

To begin with, data from the mathematics class visits are discussed. As indicated in Table 2, 83% of Grade 6 learners were in classes where the teacher answered yes to the question 'Is a textbook being used to teach Mathematics in this class?'[3]. Of the 17% of learners in classes where the teacher did not use a textbook, 67% were in classes where the reason for the non-use, according to the teacher, had to do with a shortage of textbooks. Other reasons for non-use of a textbook include the fact that the teacher had decided to use non-textbook materials, such as worksheets, instead. This largely explains why the non-use of textbooks was relatively widespread amongst quintile 5 (the least poor) schools. In quintile 5 25% of learners were in classes where the teacher did not use a textbook. The fieldworker asked learners to show their mathematics textbooks. 72% of learners were in schools where at least one such textbook could be shown and the average ratio of textbooks to learners in these schools was 0.81 (or 81 textbooks per 100 learners). In this calculation, the number of books was not allowed to exceed the number of learners, so in no school would the ratio exceed 100 books per 100 learners. After having seen the textbooks, the fieldworker asked learners who had not shown a book to stand up and to raise their hands if the answer to the question 'Did you receive the textbook?' was yes. The resultant data should have provided a composite picture of textbook access. However, there were anomalies in the data that were difficult to interpret, so no composite statistics are reported here. Perhaps the statistic that reflects textbook access problems best is the percentage of quintiles 1 to 3 learners in classes where it was not possible to see a single book. Nationally, this statistic stood at 28% in 2011.

Table 2: Grade 6 access to mathematics textbooks (2011)

	Teacher said a textbook was being used	% where textbook shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown textbooks per 100 learners (where there was at least 1)	No textbook shown amongst just quintiles 1 to 3 schools
EC	87	71	74	78	32
FS	50	59	39	65	62
GP	80	49	70	86	18
KN	86	81	75	78	22
LP	84	72	71	80	30

3 In this analysis, non-responses, which in general amounted to 5% of the sample, were completely ignored in the calculation of statistics.

MP	67	80	54	83	46
NC	86	27	68	83	26
NW	91	74	85	78	13
WC	98	0	97	94	1
SA	83	67	72	81	28

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. The same applies to similar tables appearing below. Sampling weights were used.

The 2011 values seen in the previous table are more or less in line with the 2007 values seen in Table 1. In particular, one can calculate an overall ratio of textbooks per 100 learners at the national level in 2011 by deflating the 81 value in the fourth column of Table 2 by the 72 value in the third column, which results in 58 textbooks per 100 learners. This is not very different from the 52 textbooks per 100 learners seen in Table 1. However, there appears to be far more inter-provincial variation in 2011 than in 2007.

The following table examines workbooks, using the same format as for the previous table. The fieldworker asked separately about the mathematics Workbook 1 and Workbook 2 (intended for the first and second halves of the year respectively). For the analysis presented here, the presence or use of either of the two workbooks was considered.

Table 3: Grade 6 access to mathematics workbooks (2011)

	Teacher said a workbook was being used	% where workbook shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown workbooks per 100 learners (where there was at least 1)	No workbook shown amongst just quintiles 1 to 3 schools
EC	77	77	70	90	30
FS	80	69	79	93	19
GP	66	83	54	94	35
KN	87	90	81	92	20
LP	90	72	88	95	13
MP	59	79	53	97	50
NC	85	69	84	98	18
NW	91	49	86	96	10
WC	92	11	90	98	13
SA	80	77	75	94	23

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. Sampling weights were used.

If neither workbooks nor textbooks were present in a classroom, this would point to a particularly serious problem. On the other hand, the presence of one type of book but not the other may not be problematic as teachers may have decided to focus on just one type of book on the day of the fieldworker visit. The last column in the next table is important. The values should all be zero, meaning there should no class in quintiles 1 to 3 where no book (either a workbook or a textbook) could be shown by learners. The fact that the first six provinces in the table, from EC to MP, should display worryingly high values should be of great concern. One province, MP, stands out as experiencing a particularly serious situation. The second-last column in the table is important. It suggests that where there was at least one book per class, the availability of books tended to be relatively good, as reflected by the national ratio of 94 books per 100 learners. This underlines the importance of the last column as a critical reflection of the state of access to learning materials in classrooms. A key problem seems to be classrooms serving poorer learners with no books at all, as opposed to classrooms with too few books.

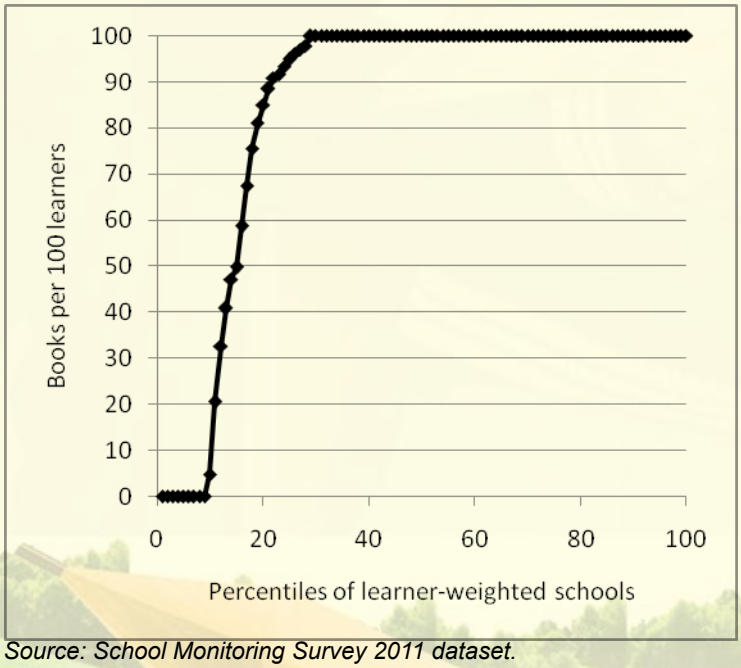
Table 4: Grade 6 access to either mathematics textbook or workbook (2011)

	Teacher said a book was being used	% where book shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown books per 100 learners (where there was at least 1)	No book shown amongst just quintiles 1 to 3 schools
EC	96	73	90	89	11
FS	91	62	84	92	14
GP	90	68	80	92	9
KN	96	84	92	93	6
LP	97	70	93	96	8
MP	89	76	82	93	19
NC	99	46	98	95	0
NW	96	51	94	96	3
WC	100	9	99	99	0
SA	95	70	90	94	8

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. For the books per 100 learners, the best ratio between the textbooks and workbooks ratio was selected and used for a school. This means that within a school the ratio can never be higher than 100. Sampling weights were used.

The following graph illustrates the distribution of the books per 100 learners statistic, including schools where this ratio is zero. Around 70% of Grade 6 learners are in schools where the ratio of books to learners is 100.

Figure 2: Distribution of books per learner ratio in Grade 6 mathematics



Source: School Monitoring Survey 2011 dataset.

The following table examines the data for Grade 9 on textbooks[4]. As there were no Grade 9 workbooks in 2011, fieldworkers visiting Grade 9 classrooms focussed on textbooks. The procedure was very similar to that applicable to the Grade 6 class visit. The textbook access figures for Grade 9 are similar to those for Grade 6 seen in Table 3. However, a comparison of the previous table and the next table indicates that access to texts in general was considerably worse in Grade 9 than in Grade 6, because Grade 9 learners did not have the benefit of a workbook as a backup where textbooks were absent. The values in the final column of Table 5 are worrying, in particular as far as FS, KN, MP and

4 There was a larger non-response problem with respect to Grade 9 textbooks, compared to Grade 6. 8% of schools had missing data. The three worst provinces, EC, FS and NW, had a non-response rate of between 15% and 20%.

NC are concerned.

Table 5: Grade 9 access to mathematics textbooks (2011)

	Teacher said a textbook was being used	% where textbook shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown textbooks per 100 learners (where there was at least 1)	No textbook shown amongst just quintiles 1 to 3 schools
EC	89	89	83	75	5
FS	63	46	59	75	36
GP	88	82	78	75	10
KN	76	66	66	52	35
LP	93	62	82	50	17
MP	73	88	61	74	44
NC	62	58	51	74	55
NW	100		92	60	8
WC	80	43	79	78	0
SA	83	67	74	65	21

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. Sampling weights were used.

The next table is the language of equivalent of Table 4, which dealt with mathematics in Grade 6. The language class considered was the one where the 'predominant' language of learning and teaching (LOLT) in the school was taught. For 89% of Grade 6 learners this language was English. The situation appears to be worse for language than it was for mathematics. For instance, as many as 17% of quintiles 1 to 3 learners were in schools where no books could be shown to the fieldworker (for mathematics the figure was 8%).

Table 6: Grade 6 access to either language textbook or workbook (2011)

	Teacher said a book was being used	% where book shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown books per 100 learners (where there was at least 1)	No book shown amongst just quintiles 1 to 3 schools
EC	83	78	78	82	19
FS	77	77	80	92	17
GP	85	78	81	91	11
KN	88	80	82	83	15
LP	80	89	78	79	20
MP	68	87	62	85	39
NC	80	62	88	92	13
NW	97	85	86	90	12
WC	91	47	97	97	0
SA	84	80	81	86	17

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. Sampling weights were used.

The next table deals with language textbooks available in Grade 9 classes. What is striking about this table is that almost half of quintiles 1 to 3 learners were in schools where no language textbook could be seen.

Table 7: Grade 9 access to language textbooks (2011)

	Teacher said a textbook was being used	% where textbook shortage was the cause for non-use	At least one book could be shown to fieldworker	Average shown textbooks per 100 learners (where there was at least 1)	No textbook shown amongst just quintiles 1 to 3 schools
EC	91	95	88	73	16
FS	27	89	27	60	68
GP	62	79	56	81	37
KN	68	77	51	54	48
LP	63	89	41	54	57
MP	47	81	38	81	70
NC	72	45	59	62	34
NW	88	48	77	60	22
WC	69	12	62	86	17
SA	67	77	55	67	44

Source: School Monitoring Survey 2011 dataset.
Note: All statistics except the books per 100 learners ratio are percentages of learners. Sampling weights were used.

Apart from the fieldworker visits to classrooms, the School Monitoring Survey included a process whereby a teacher familiar with the textbook situation in the school was given a form and asked to collect, from other teachers, estimates of the percentage of learners having access to textbooks across a wider range of grades and subjects than was possible for the classroom visits. This process became known informally as the 'light touch' survey as it involved far less data verification than the classroom visits. The mean for Grade 6 mathematics in the following table, which is 74 books per 100 learners, when compared to the ratio of 58 discussed above and derived from Table 2, suggests that the two methods of data collection yielded rather different results. If one makes the same comparison for mathematics in Grade 9, one obtains a gap between a ratio of 48 derived from Table 5 against the mean of 68 in Table 8. An examination of the distribution of the two statistics indicates that most of the difference has to do with the percentage of learners in schools where there are no textbooks at all. To illustrate, according to the 'light touch' process, 6% of learners are in schools where, according to the data, no-one has access to a Grade 9 mathematics textbook. This figure is 26% (100 minus 74) if one reads Table 5 and if one makes the assumption that if no learner was able to show a textbook in the class to the fieldworker, then no learners had access to textbooks. Clearly this latter assumption is flawed. What is very possible is that learners sometimes used textbooks, either textbooks they could keep at home or textbooks often kept in a storeroom at school, but did not have these textbooks with them on the day of the fieldworker visit. This may represent a different kind of access to textbooks problem if one's assumption is that learners should always have their textbooks with them in their mathematics class. Clearly, textbook access is not easy to gauge, partly because one must depend on a number of assumptions and because data collection can be difficult. Yet this aspect of schooling must be monitored and the statistics obtained through the 2011 survey, though not perfect, are a significant step in the right direction, especially given how little was known about textbook access previously.

Table 8: 'Light touch' survey results for Grades 3, 6 and 9 (2011)

		% in schools with this	*% of learners with textbook*				% able to take textbook home
			10th p'tile	Median	90th p'tile	Mean	
Grade 3							
Literacy - textbook		88	0	94	100	71	42
Literacy - reader		89	10	90	100	71	48
English* - textbook		66	0	60	100	57	36
English* - reader		69	0	70	100	60	43
Numeracy		92	0	95	100	72	43

Life skills		85	0	60	100	58	35
Grade 6							
Home language - textbook		94	20	83	100	72	53
Home language - fiction		38	40	95	100	79	1
1st additional lang. - textbook		92	0	80	100	67	50
1st additional lang. - fiction		74	0	60	100	59	48
Mathematics		95	20	95	100	74	54
Natural science		94	5	75	100	67	50
Social sciences		93	0	60	100	64	49
Technology		92	0	60	100	60	47
Economic & management sci.		92	0	65	100	62	48
Life orientation		92	0	60	100	60	46
Arts and culture		89	0	60	100	60	45
Grade 9							
Home language - textbook		88	0	70	100	63	63
Home language - fiction		73	0	60	100	59	60
1st additional lang. - textbook		89	0	70	100	63	61
1st additional lang. - fiction		73	0	60	100	59	61
Mathematics		94	15	75	100	68	68
Natural science		92	20	80	100	68	67
Social sciences		93	5	65	100	62	64
Technology		92	3	70	100	64	64
Economic & management sci.		92	10	70	100	66	66
Life orientation		90	0	70	100	64	63
Arts and culture		91	0	65	100	60	62

Source: School Monitoring Survey 2011 dataset.
Note: To illustrate, the 10th percentile value is the percentage of learners accessing textbooks amongst the schools with the worst situation, specifically schools one-tenth from the bottom of the list of ranked schools. In this calculation, schools are weighted by total learners in the grade in question. The Grade 3 English statistics (*) apply only to those taking English as an additional language, not as a home language. The '% in schools with this' statistic is learners in the grade who are in schools where the subject is offered, divided by all learners in that grade across all schools. The '% of learners with textbook' statistic is based on the teacher's indication of the percentage of learners with access to a textbook. The percentile, median and mean values are calculated using the sample weights representing enrolment in the population (in the grade in question). The '% able to take textbook home' statistic is learners in the schools where books can be taken home over all learners in schools where the subject is offered (all specific to the grade in question).

One important thing that the 'light touch' data show, if one looks at the previous and the next tables, is that there has been a noticeable bias in favour of the more high profile subjects, such as mathematics, with respect to textbook resourcing. This pattern is particularly noticeable in Grades 6 and 9. In Grade 6 at least 10% of learners found themselves in schools in 2011 where there were reportedly no textbooks for the subjects social sciences, technology, economic and management sciences and arts and culture. This situation applied to arts and culture in Grade 9. All these subjects are compulsory subjects, despite the fact that according to the survey fewer than 100% of schools are said to offer these subjects (this latter finding could be a manifestion of non-response in the survey). The 10th percentile statistics in Table 8 indicate that the situation was considerably better for mathematics and to some extent better for natural science.

Table 9: 'Light touch' survey results for Grade 12 (2011)

		% taking subject	*% of learners with textbook*				% able to take textbook home
			10th p'tile	Median	90th p'tile	Mean	
Grade 12							
Home language -textbook		90	40	100	100	84	76
Home language - fiction		75	30	100	100	84	80
1st language - textbook		91	30	100	100	83	77
1st language - fiction		76	30	100	100	85	77
Agric. management practices		2	0	100	100	68	75
Agricultural sciences		37	45	100	100	82	74
Agricultural technology		1	0	100	100	62	91
Civil technology		11	0	100	100	74	75
Computer applications tech.		34	80	100	100	93	87
Consumer studies		29	80	100	100	92	80
Dance studies		1	100	100	100	93	71
Design		3	100	100	100	91	79
Dramatic arts		5	0	100	100	83	75
Electrical technology		6	40	100	100	77	83
Engineering graphics & design		18	50	100	100	91	87
Hospitality studies		12	50	100	100	90	89
Information technology		15	100	100	100	95	89
Life orientation		91	40	100	100	84	79
Life sciences		90	50	100	100	86	79
Mathematics		93	52	100	100	90	81
Mathematical literacy		87	40	100	100	85	80
Mechanical technology		10	45	100	100	90	84
Metal work		1	0	100	100	81	19
Music		5	0	100	100	79	82
Physical sciences		86	50	100	100	88	81
Visual arts		11	0	100	100	82	82
Accounting		85	50	100	100	87	80
Business studies		86	45	100	100	87	81
Economics		75	40	100	100	85	78
Religious studies		3	0	100	100	84	89
Geography		79	50	100	100	88	83
History		56	30	100	100	86	81
Tourism		48	30	100	100	84	80

Source: School Monitoring Survey 2011 dataset.
Note: See notes for previous table.

From the preceding analysis, it should be clear that there are many possible ways in which the 2011 SMS data could be used to produce a composite measure of access to texts amongst learners. Below one option is discussed. This option focuses on the number of books (either textbooks or workbooks in the case of Grade 6) per 100 learners, where the value for a single school cannot exceed 100. It does so in a rather conservative sense insofar as only books actually seen by the fieldworker are considered (the 'light touch' data are thus not used). Schools with zero books must obviously be taken into consideration, but this is done in such a way that schools that for good educational reasons appear to have zero books do not have a downward impact on the composite measure. To deal with the last criterion, schools in quintiles 4 and 5 (the least poor quintiles) where no books could be seen, but where the teacher said that four typical provisioning problems did not play a role, are considered to be schools where the availability of texts is not a problem. The four provisioning problems are, in the words of the questionnaires, 'the school did not receive ordered books', 'some or all books received were in the wrong language', 'some or all books received were at the incorrect language level', and 'there were not enough textbooks for all learners'. It was thus assumed that even if there were no books, the teacher was able to teach using materials such as loose worksheets and learner files. Equation (1) below indicates how the composite measure *i* for each province and subject-grade combination is calculated. Value *a* is the percentage of learner-weighted schools where at least one book could be shown to the fieldworker (for instance the third column in Table 4 expressed as a percentage), *b* is the average shown books per 100 learners, where there was at least one shown book (fourth column) and *c* is the percentage of schools where no book was shown but the school was either in quintile 4 or 5 and the teacher reported that there was no provisioning problem.

$$i = \frac{b\ a + c(100 - a)}{100} \qquad (1)$$

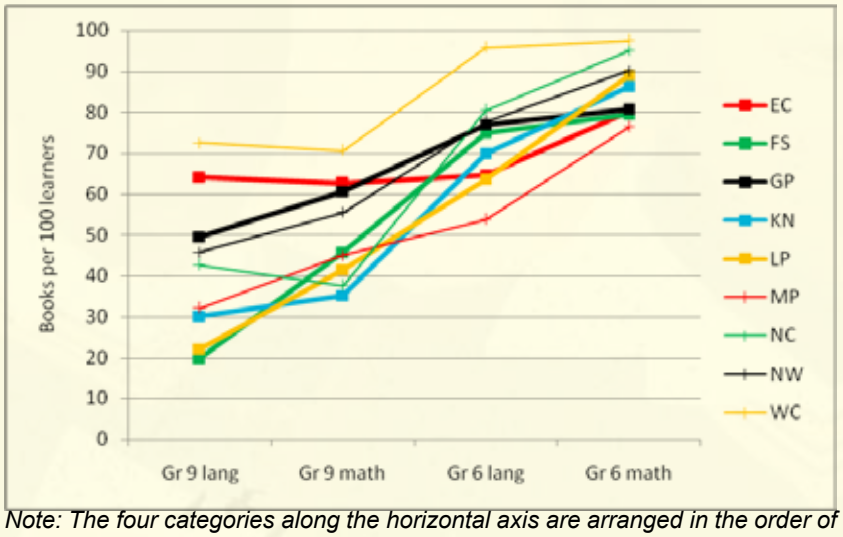
Table 10 reflects the values for *c* and *i*. The average is the simple average across the four values *i*. As one would expect, the adjustment factor *c* plays an especially large role in the two better off provinces WC and GP.

Table 10: Composite measures of access to texts (2011)

	% of schools with no shown books which can be considered non-problems (value *c*)				Composite measure *i*				
	Gr 6 math	Gr 9 math	Gr 6 lang	Gr 9 lang	Gr 6 math	Gr 9 math	Gr 6 lang	Gr 9 lang	Average
EC	0	0	0	0	80	63	65	64	68
FS	15	7	8	8	80	46	75	20	55
GP	37	13	17	12	81	61	77	50	67
KN	0	4	16	9	86	35	70	30	55
LP	0	11	10	0	89	42	64	22	54
MP	0	0	3	3	76	45	54	32	52
NC	86	0	0	23	95	38	80	43	64
NW	0	0	0	0	90	56	78	46	67
WC	0	55	43	59	98	71	96	73	84
SA	13	9	9	10	85	49	71	40	61

The next graph illustrates the values *i* from the previous table for the four subject-grade combinations. To some degree, there is consistency in the rankings across the four combinations. For instance, WC clearly performs consistently well against the indicator. NW is always in the top half of the distribution. MP is consistently in the bottom half of the distribution.

Figure 3: Composite measures of access to texts (2011)



Note: The four categories along the horizontal axis are arranged in the order of their average values.

Are there any patterns in the above measures that are surprising or that contradict what we know about the schooling system? Perhaps the most striking thing is that at the Grade 9 level, EC does relatively well, which in turn pushes the EC average in Table 10 up, despite the fact that EC does so poorly in virtually all standardised assessments and examinations. It is likely that this is related to exceptional circumstances in EC in relation to Grade 9. These exceptional circumstances are, firstly, that most Grade 9 learners in the province attend schools which stretch from Grade 1 to 9 (and not Grade 8 to Grade 12 as in all other provinces) and, secondly, that dropping out beyond around Grade 7 is particularly high in EC, so Grade 9 attainment in the population is exceptionally low. It is possible that the status of Grade 9 as an end-point in many schools, added to the fact that enrolments in Grade 9 are relatively low, create a situation where it is possible to achieve relatively good textbook coverage in this grade.

How well do the averages seen in the last column of Table 10 correspond to the official indicator, whose wording is: 'The percentage of learners having access to the required textbook and workbooks for the entire school year'. The method used to calculate the averages falls short of the indicator description in a number of ways. Firstly, presence of books on one day, as opposed to the entire year, has been measured. It is likely that many schools would not have had an equally good situation during the first month of the school year when perhaps books were still on their way to the school. Secondly, as discussed above, not having one book per learner available in the classroom on the day of the fieldworker visit does not necessarily mean that the learner does not have access to the required materials. The learner may simply have forgotten a book at home on the day concerned. Moreover, there is some research that indicates that where learners share books with just one other learner, the learning process is not unduly compromised. Thirdly, the method used assumed that workbooks and textbooks were perfect substitutes in the case of Grade 6, which is clearly not true. Fourthly, the method does not take into consideration whether learners can take books home, yet we know that access to books at home contributes to learning. There were in fact questions in the 2011 SMS questionnaires that asked whether books had been taken home. For instance, Table 8 above shows that only around half of Grade 6 learners could take their mathematics textbooks home. Lastly, the method looks at different subjects separately, whilst the indicator description is implicitly concerned with identifying learners with access to the required texts across *all* their subjects. To illustrate this matter, whilst Grade 6 access to mathematics texts stands at 85% in Table 10 and at 71% in language, the figure becomes just 66% if one looks for access to books in both subjects simultaneously within a school[5].

Notwithstanding the caveats described above, the average values in Table 10 appear to get close to an optimal way of using the data we have in order to gauge access to texts. Obviously they need to be interpreted in the light of the underlying methodology, but also the various trends that have been identified in the above analysis.

What the analysis tells us about improving measurement

Systematic monitoring of the availability of books in the schooling system is unfortunately not something that has occurred with sufficient frequency in the past. The 2011 SMS is a major step forward with respect to obtaining the necessary data and exploring methodologies for monitoring access to texts in schools. What is clear is that there are several methodological complexities. Continuing the kind of work initiated by the 2011 SMS is important.

Three concrete improvements to the current method seem particularly necessary:

- There should be a few questions posed to the teacher about the complementarity of workbooks and textbooks. For instance, roughly how does the teacher split up the time between the use of the textbook and the workbook?

5 The approach here was to consider the lowest of the two ratios within each school.

Does the teacher perhaps believe that just one of the two is enough?

- There should moreover be some questions posed to the teacher on how sharing of books is organised in classrooms with an insufficient number of books. South African policy is not favourably disposed to the sharing of textbooks, yet there are many classrooms where there is not a book for every learner and research has shown that if properly organised, sharing need not compromise learning unduly.

- Lastly, the instructions for gathering data from learners during the class visit seems cumbersome and unclear. As noted above, the data on the reasons why learners do not have books with them are problematic and could not be properly analysed. This seems related to the method used in the classroom. A cleaner approach may be to get all learners to stand, showing a book if they have one. Then learners with books could be asked to sit down and one could check that the number remaining standing was correct. Then one could go through various explanations for non-possession of a book and get learners to sit down as they matched particular explanations. Above all, an attempt must be made to ensure that values in different variables tally with each other and that there is not double-counting where there should not be. All this assumes that the questionnaire questions and instructions are totally unambiguous.

What the analysis tells us about improving our plans

It is important that actions that influence access to texts be more clearly stated in provincial and national plans, with a proper statement of how the different numbers 'hang together': funds allocated to schools for purchasing of materials, deliveries of new curriculum and top-up textbooks from the department itself, average cost of different kinds of books, trends with respect to textbook retention at schools, desirable stop-gap targets, such as two learners per book, where there is virtually zero access currently, and so on. Unfortunately, there appears not to be a single provincial plan (or monitoring report) which has succeeded in explaining these matters in a comprehensive manner. Instead, plans will sometimes focus just on the delivery of one type of item to schools and create the impression that if delivery of this item is 100%, then there is no problem at the school level. This is unsatisfactory. One thing the DBE could do is to introduce a logical table that relates, above all, (1) existing stock of books in schools, (2) new books and funds intended for books injected into the system, (3) average cost per book and (4) assumed book lifespan to each other. Such a table would need to be tested with real data and real provincial circumstances to see whether it was able to serve as a tool to improve the monitoring of the availability of books. Of course one part of the challenge would be to deal with the complexity created by a multitude of subjects, grades and types of texts.

4 Strengthen school management and promote functional schools

4.1 Indicator on curriculum coverage

The full numbering and wording of this indicator is as follows:

4.1.1: The percentage of learners who cover everything in the curriculum for their current year on the basis of sample-based evaluations of records kept by teachers and evidence of practical exercises done by learners

Summary for this indicator

New analysis of the 2011 School Monitoring Survey curriculum coverage data is provided which shows, firstly, that the data are useful and should be collected again, with some enhancements, and, secondly, which provinces and aspects of schooling require very urgent attention. The analysis suggests that in virtually all of the system there is a need for more frequent written work by learners and more frequent and informative teacher marking. To illustrate, six or fewer written exercises in mathematics in a month, in both grades 6 and 9, is a reality for around half of learners. This reflects a worryingly low level of effort. In Grade 6 mathematics, around 20% of learners had no teacher marking that could be seen in their exercise books. This reflects an important opportunity. If basic accountability and monitoring in schools can be strengthened, largely through the actions of school principals, then surely the problem of exercise books with no marking by the teacher at all can be eliminated.

GP and WC stand out as provinces with relatively high levels of effort in the classroom, as demonstrated by written exercises in learner books. Yet even in these provinces there are far too many schools where evidence of teacher marking or learner exercises is absent. KN and MP stand out as more rural provinces with relatively high levels of written exercises per month. What stands out as particularly worrying is the low level of classroom effort (in terms of exercises per week) in EC and NW and the particularly poor situation in FS when it comes to the presence and depth of teacher marking.

Detailed analysis

During the SMS classroom visits, fieldworkers gathered the writing books of one learner per visited class, specifically

the learner considered to be 'one of the best learners', and examined the books to check curriculum coverage. This occurred for both language of learning and teaching (English in the great majority of schools, Afrikaans being almost certainly the only other possibility) and for mathematics. There was no requirement that the learner in one subject should be the same learner as the learner in the other subject. The following table indicates the extent, by province, to which schools had this curriculum coverage data. A few key variables were checked and if values were consistently missing, the entire school was considered not to have the data. It is important to note that where both Grade 6 and 9 existed in a school, just one of the two grades would be selected on a random basis. FS stands out as the province with the lowest availability of data, at 92% (see the last column). Data availability for the other eight provinces can be considered very good. Even in the case of FS, one might expect meaningful statistics, though in the case of this province one would need to be especially cautious when interpreting the data.

Table 11: Data availability by province for curriculum coverage

	Schools with any data	Schools with Grade 6 (A)	Schools with Grade 9 (B)	Schools with either Grades 6 or 9 (C)	Schools with Grade 6 curriculum data (D)	Schools with Grade 9 curriculum data (E)	D / A x 100	E / B x 100	(D + E) / C x 100
EC	342	284	200	311	236	72	83	36	99
FS	172	129	46	156	113	30	88	65	92
GP	197	131	64	190	129	54	98	84	96
KN	361	237	114	329	236	92	100	81	100
LP	272	165	100	261	163	97	99	97	100
MP	184	118	74	170	110	55	93	74	97
NC	137	101	50	133	94	36	93	72	98
NW	171	114	59	159	108	51	95	86	100
WC	169	129	58	163	125	38	97	66	100
SA	2,005	1,408	765	1,872	1,314	525	93	69	98

Fieldworkers were instructed to examine all the writing books of the learner selected in a class. It appears as if there was no special effort made to ensure that the writing books of the learner were present at the school on the day of the fieldworker's visit, so one can assume that what the fieldworkers saw would in many cases represent an incomplete picture of what the learner had written, as books would have been left at home or might have been lost. The patterns seen in the data support such an assumption.

For Grade 6, fieldworkers were explicitly instructed to ask for the 'DBE workbooks', both parts 1 and 2, in the case of both subjects. What may appear odd from the figures that follow in the analysis is how many learners were able to show written work in their language workbooks. This is odd if one considers that officially the only learners who should have been using national workbooks in their language of learning and teaching (LOLT) language class should be those learners who were *also* taking English or Afrikaans as a home language, which would be around 25% of learners. Yet close to 40% of schools in the SMS had learners who were using the workbook in the visited Grade 6 language class (see Table 12). The explanation is probably that a large number of learners who were taking English as a first additional language (FAL) acquired the English home language workbooks and used these. This was reportedly fairly common in 2011. In 2012 the situation changed as separate English FAL workbooks were introduced for the first time.

The next two tables indicate the combinations of books examined in Grade 6. One might expect the existence of so many options to create 'noise' in the data as the prevailing option on the day of the fieldworker would be influenced by factors such as whether specific books were left at home. It is noteworthy that for every learner in Grade 6 only one non-workbook, in each subject, was examined, according to the data. There were thus no instances where two or three non-workbooks were examined. This seems strange and could point to problems with the data.

Table 12: Books examined for Grade 6 language curriculum coverage

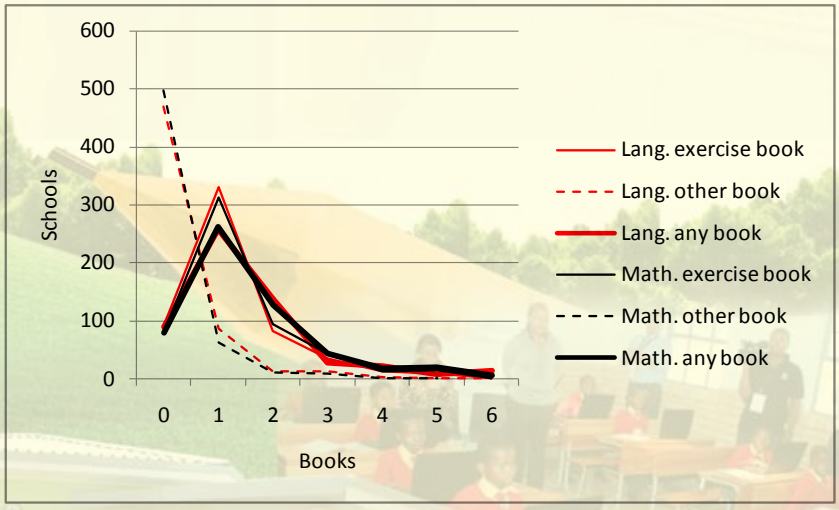
DBE workbook 1	DBE workbook 2	Exercise class book/file	Other workbooks (project-based, educator-developed, etc.)	Number of schools
		X		577
X		X		183
	X	X		160
X	X	X		136
		X	X	115
			Other combinations	135
			Total (includes 15 schools with nothing in all columns)	1,306

Table 13: Books examined for Grade 6 mathematics curriculum coverage

DBE workbook 1	DBE workbook 2	Exercise class book/file	Other workbooks (project-based, educator-developed, etc.)	Number of schools
X	X	X		503
		X		239
X		X		209
	X	X		158
			Other combinations	200
			Total (includes 29 schools with nothing in all columns)	1,309

In the case of Grade 9 patterns more like something one would expect is found: many learners have two or three or even more non-workbooks that were examined. This is illustrated in the next graph. For Grade 9 fieldworkers noted down how many books belonged to the category 'Exercise class book/file' and how many belonged to the category 'Other workbooks (project-based, educator-developed, etc.)'. However, when exercises were counted, no differentiation was made between in the two categories. In Grade 6, on the other hand, the count of exercises per month was categorised according to whether the book was a workbook or a non-workbook.

Figure 4: Books examined in Grade 9



The fieldworker was required, for all four grade-subject combinations, to count written exercises in the books, first

according to the month in which the exercise was done and then according to the 'core skill' receiving the focus in each exercise. For the former breakdown, the months of January to November 2011 plus a category 'undated' were available. For the latter breakdown there were seven core skills for the subject language, in each of Grades 6 and 9, and in mathematics there were 17 core skills in Grade 6 and 20 in Grade 9. The data by core skill are more difficult to interpret than the data by month. Specifically, books being left at home are likely to influence strongly differences across schools in core skills covered. On the other hand, if all one wants is a sense of the intensity of work occurring in the class, in terms of exercises per month, then it does not matter that much if books written in during the year have been left at home. One can simply focus on whatever months for which books are available.

One issue that is important and fairly unambiguous in the data, yet an issue that was not dealt with in the official report, is the kind of marking done by teachers. This issue is analysed below.

What is noteworthy in the following table is that there were far more exercises seen in non-workbooks than in workbooks (WB) at the Grade 6 level. For instance, for October only 15% of Grade 6 language learners had exercises that could be seen in workbooks (the median exercises per learner where at least one workbook could be seen was three exercises) whilst 83% of learners had exercises that could be seen in non-workbooks (here the median was four exercises). What is also noteworthy is that exercises done in the first months of the year could be seen to a large extent. For instance, 95% of Grade 9 mathematics learners were able to show exercises from January. This suggests that it is easy for learners to refer back to earlier work, probably because exercises are written in books that are large enough to last the whole year.

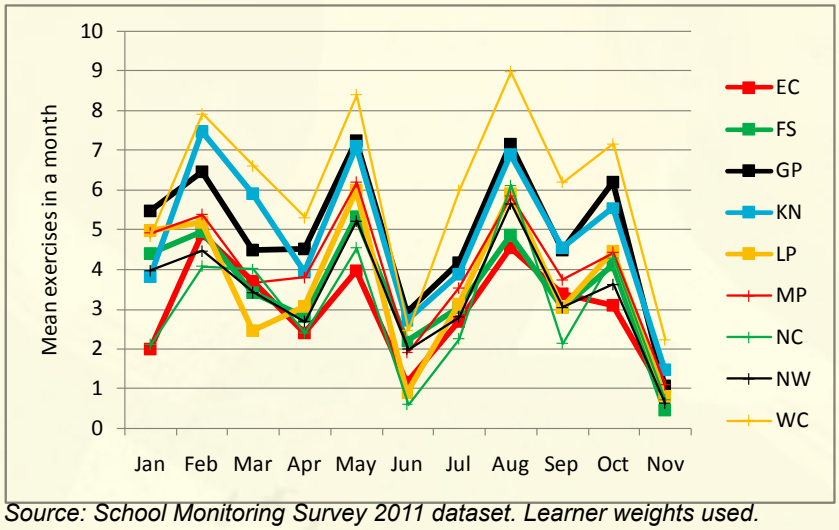
Table 14: Exercises across months

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	No date	Total
Gr 6 lang WB	%	10	13	14	11	13	8	15	17	14	15	5	22	36
	Median	2	3	2	3	3	2	3	3	3	3	2	12	19
Gr 6 lang other	%	87	92	86	80	91	54	79	91	79	83	31	30	98
	Median	3	5	3	3	5	2	3	5	3	4	2	3	33
Gr 6 math WB	%	18	21	22	23	23	16	28	30	27	27	10	36	63
	Median	4	5	4	4	5	3	4	5	4	4	3	18	27
Gr 6 math other	%	91	93	88	85	92	63	85	92	85	87	36	26	97
	Median	6	8	5	4	8	3	5	8	5	5	2	4	58
Gr 9 lang	%	90	94	89	71	90	40	76	92	79	58	4	34	100
	Median	3	4	3	2	4	2	2	4	2	2	2	3	27
Gr 9 math	%	95	98	94	84	94	48	84	97	89	71	5	31	100
	Median	5	8	5	4	7	2	4	7	5	3	2	4	51

Source: School Monitoring Survey 2011 dataset.
Note: Grade 6 figures are presented separately with respect to national DBE workbooks ('WB') and other writing books. '%' is the percentage of schools with non-zero values. Schools with completely missing data were excluded from this calculation. 'Median' is the median number of exercises, counting only non-zero values. The 'Jan' to 'No date' columns represent cells in the original questionnaire. 'Total' is derived and is the total across the previous twelve columns, calculated at the level of the school (and also the learner as there is one learning representing each school).

The next graph illustrates the trend across months by province for just Grade 6 language. Exercises in workbooks were added to exercises in non-workbooks and zero exercises in a month was included in the calculation of the means. What this graph suggests is that the ranking by province is not very sensitive to the months one considers. Relatively well performing provinces are clearly WC, GP and KN, whilst provinces demonstrating consistently low levels of effort in terms are number of exercises are EC, NW, FS and NC.

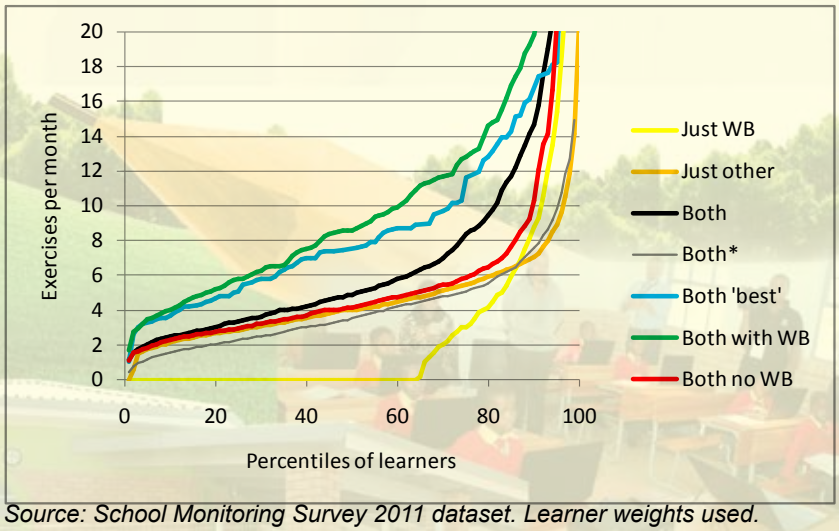
Figure 5: Exercises seen per month in Grade 6 language



Source: School Monitoring Survey 2011 dataset. Learner weights used.

The following graph illustrates the distribution of values across schools, for Grade 6 language. Unlike the previous graph, this graph concentrates on the monthly number of exercises only where a non-zero value appears for a month. An average number of exercises per month and per school are calculated using only those months with non-zero values. Undated exercises are spread across the non-zero months or, if all months carry a zero, undated exercises is simply divided by one (this applied to 9% of schools and nearly always with respect to workbooks, not non-workbooks). The 'Just WB' curve illustrates average exercises per month observed in the national workbooks. Around 65% of schools (learner-weighted) have zero exercises in these workbooks, maybe because workbooks were not available for inspection (see Table 12). However, as the 'Just other' curve shows, virtually all schools had exercises that could be seen within other kinds of books. If both workbooks and non-workbooks exercises are considered, the curve 'Both' is obtained. 'Both*' follows a more conservative calculation where the total number of exercises is divided across 11 months, January to November, even if there are months with zero in the data. This curve thus assumes that zero for a month means that the learner did no exercises. 'Both best' is the curve obtained, using the same method as for 'Both', if only historically white and Indian schools are considered. These schools had particularly high values and could in some ways be said to represent good practice. This is of course very debatable, but for the purposes of this analysis this kind of benchmarking seemed practical. Finally, the curves 'Both with WB' and 'Both no WB' involve a splitting up of the curve 'Both', so that schools which had exercises observable in the national workbooks are placed in one group and those schools without such exercises were placed in a second group. The first group comprised 28% of (learner-weighted) schools. What these last two curves demonstrate is that it is possible that the presence of workbooks increased the number of exercises done. One might speculate that this is occurring because where schools do not have workbooks, learners perform fewer exercises, specifically around five exercises fewer at the median. Of course there could be many reasons why the first group of schools had more observable exercises than the second group. For instance, it could be that these schools had more motivated and creative teachers, who liked using the workbooks, but who even in the absence of the workbooks would have performed a higher number of exercises with learners. Yet the association between having workbooks and there being more observable exercises is large and noteworthy, even if one can only speculate about the precise meaning of this.

Figure 6: Exercises seen per month in Grade 6 language

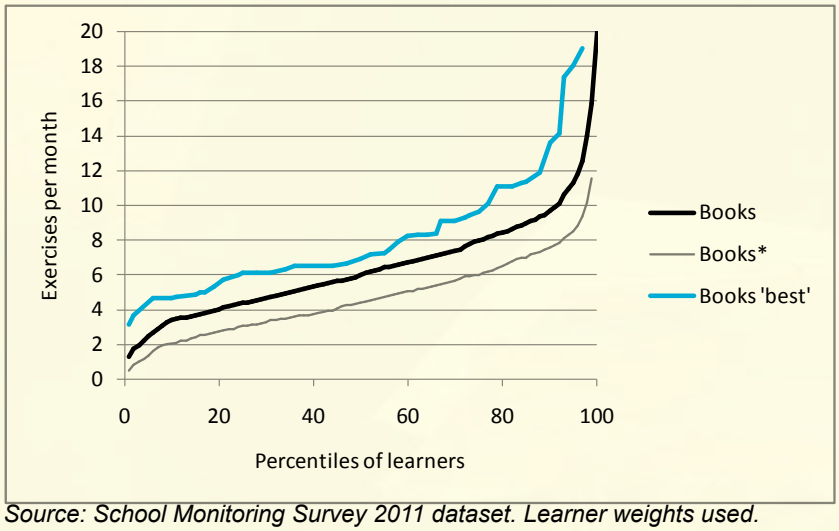


Source: School Monitoring Survey 2011 dataset. Learner weights used.

What else does the above graph show us? One thing that stands here, as in so many statistics on the schooling system, is the great inequality between schools. The 'Both' curve, which is perhaps the most reliable indicator of what is occurring across all schools, displays fewer than four exercises per month (or around one per week) in the case of around 40% of schools, and more than 10 per month for around 20% of schools. These differences should be interpreted with caution, however. It could be that schools with fewer exercises are doing exercises that are of a greater depth and complexity. One should bear in mind that there could be more learning associated with one complex exercise than with three very simple exercises. It is noteworthy that even amongst the supposedly better schools of the 'Both best' curve, there is substantial inequality. Importantly, because of the way the statistics have been calculated, and because data availability across all the months of the year was relatively good, it seems unlikely that the above graph would have looked very different had the fieldworker had access to all books, even those left at home. This applies particularly to the 'Both' and 'Both best' curves, which ignore months with zero values. The inequalities one is seeing are probably real and not to a large degree the result of measurement error. It is the statistics on coverage of core skills, discussed further down, which would be distorted to a much larger degree by the availability of the learner's books.

The following graph repeats the analysis of the previous graph for Grade 9 mathematics. Here the analysis excludes national workbooks as this resource was not available in Grade 9 in 2011. As in the previous graph, the tendency is for historically white and Indian schools to perform two to three exercises per month more than what is the case in schools across the country in general.

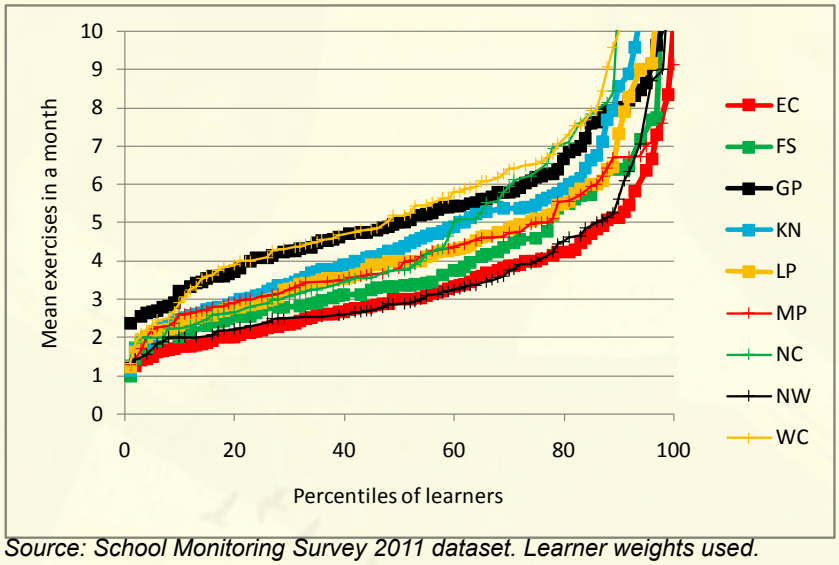
Figure 7: Exercises seen per month in Grade 9 mathematics



Source: School Monitoring Survey 2011 dataset. Learner weights used.

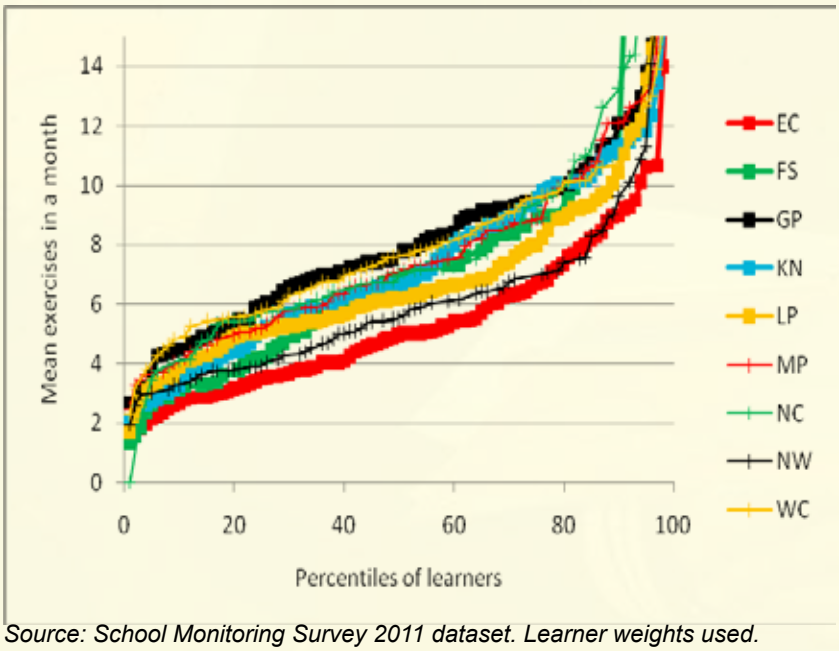
The next four graphs provide provincial breakdowns of the curves 'Both' in Figure 6 and 'Books' in Figure 7 for the four grade-subject combinations. The provincial rankings are similar to what appeared in the official SMS report, but the advantage with the graphs provided below is that they clarify what the entire distribution is. The official report focussed on the percentage of learners for whom four or more exercises per week (around 16 per month) could be seen. As the previous two graphs indicate, this is a very high benchmark and the extremely low percentage values in the official report are to be expected. Even historically white and Indian schools very seldom reach a level of 16 exercises a month (to illustrate, only 12% do according to Figure 5). One important thing that the following graphs confirm is that there are not many schools with no exercises to be seen at all. Put differently, the notion of a large proportion of schools which have reached a state of complete dysfunctionality is not supported by the data. Some learning is happening in virtually all schools, even if the level of effort is often too low. A second statistic presented by the official report is the average number of exercises performed per week. The values for this statistic, when converted to monthly values, are a bit higher than what is seen at the percentile 50 point (or the median point) in the following graphs, mainly because outliers with exceptionally high values would push the average up in the official report. In many respects, the median is a more reliable measure than the mean.

Figure 8: Exercises seen per month in Grade 6 language by province



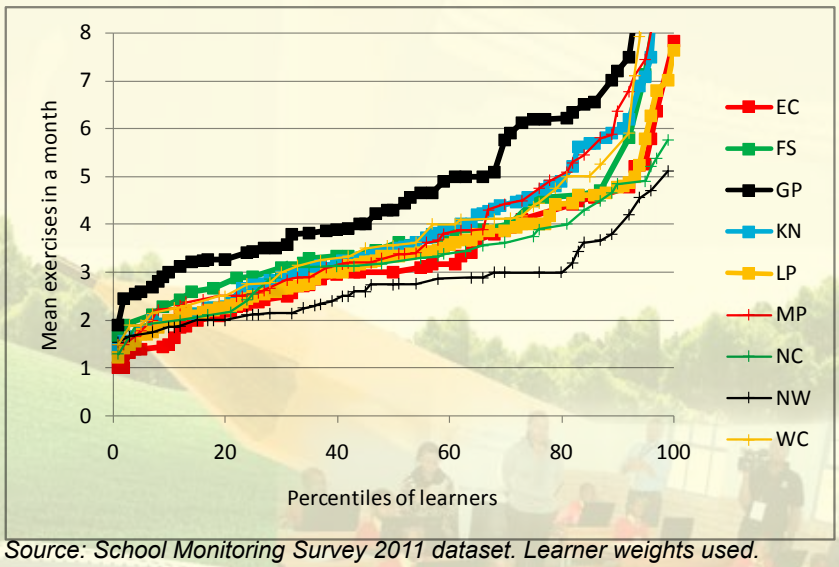
Source: School Monitoring Survey 2011 dataset. Learner weights used.

Figure 9: Exercises seen per month in Grade 6 mathematics by province



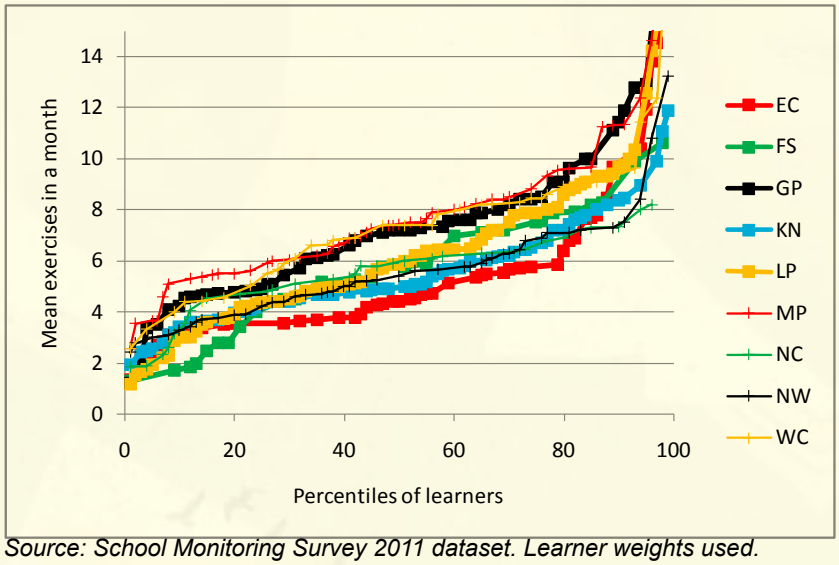
Source: School Monitoring Survey 2011 dataset. Learner weights used.

Figure 10: Exercises seen per month in Grade 9 language by province



Source: School Monitoring Survey 2011 dataset. Learner weights used.

Figure 11: Exercises seen per month in Grade 9 mathematics by province

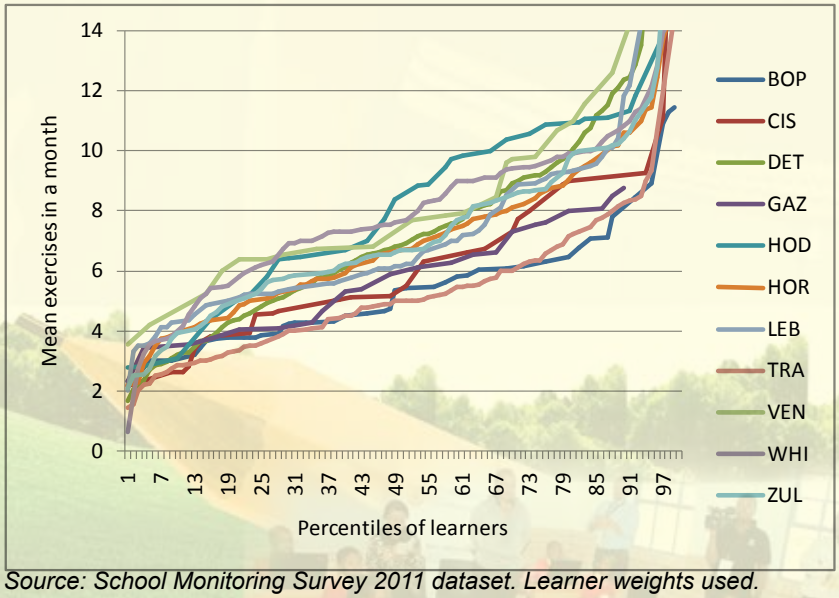


Source: School Monitoring Survey 2011 dataset. Learner weights used.

If one compares the previous four graphs, one thing that stands out is that although KN does well in the first three graphs, in Figure 11, which deals with Grade 9 mathematics, the performance of this province in nearer the bottom than the top. This warrants some attention from KN planners. Is there perhaps a weakening in the focus on mathematics in the higher grades in this province? In WC, performance is very good in three graphs, but not in the Grade 9 language graph (Figure 10). Again, is this perhaps an area that WC planners need to pay special attention to?

A few interesting patterns emerge if we view the data used for the Grade 6 mathematics graph (Figure 9) according to the pre-1994 apartheid administration. Historically Indian schools (HOD) display relatively good indicator values. On the right-hand side of the distribution the situation is better in these schools than in historically white schools (WHI). Amongst historically African schools, the problem of relatively few exercises per week is more common in the rural ex-homeland schools than amongst the more urban ex-DET schools. However, within one province performance appears to vary according to which homeland administration the school historically fell under. Of course the smallness of the sample at this level should guard one against any hard conclusions based on just this data source. Yet it is worth noting that in EC, ex-Transkei schools (TRA) appear to be performing fewer exercises than ex-Ciskei (CIS) schools. Similarly, in LP ex-Venda schools (VEN) appear to perform better against the indicator than ex-Gazankulu schools (GAZ), with ex-Lebowa schools (LEB) falling between the two. Ex-Bophuthatswana schools (BOP), largely found in NW, perform as poorly as ex-Transkei schools in EC.

Figure 12: Exercises seen per month in Grade 6 mathematics by ex-department

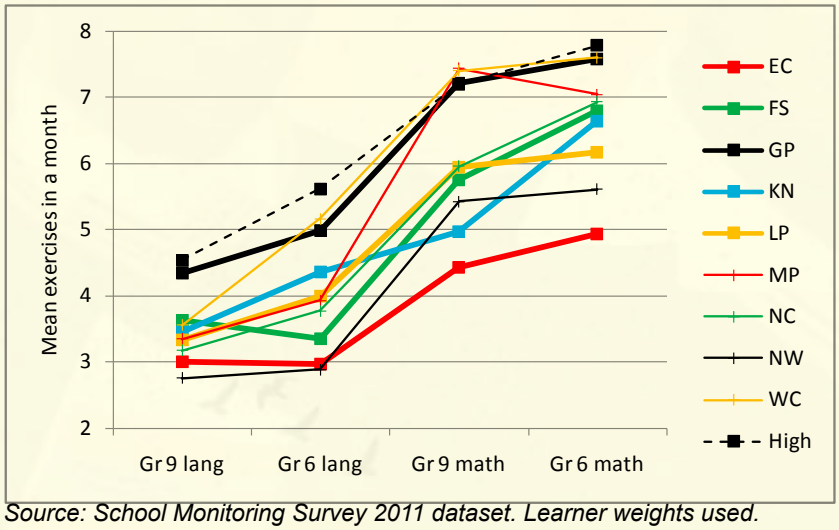


Source: School Monitoring Survey 2011 dataset. Learner weights used.

Figure 13 below sums up what was found in the preceding graphs. The median values from the four graphs Figure 8 to Figure 11 are illustrated. The order of the categories along the horizontal axis is according to the average height of the curves. The fact that mathematics books display more written exercises per month than language books, in both

grades, is almost certainly due mostly to the inherent structure of the different types of exercises, rather than a relative under-performance in languages.

Figure 13: Summary of statistics from previous graphs



Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: The four categories along the horizontal axis are arranged in the order of their average values. Though the mean per month and per school is used in the calculation, the provincial values are the median of the means. The curve 'High' reflects the situation in historically white and Indian schools.

The next table presents the values underlying the previous graph, as well as values in Grade 6 for just non-workbooks. The non-workbooks statistics support the patterns seen in the above graph. For instance, the relatively poor performance of NW holds whether one looks at workbooks and non-workbooks combined, or non-workbooks on their own.

Table 15: Summary provincial statistics on exercises seen

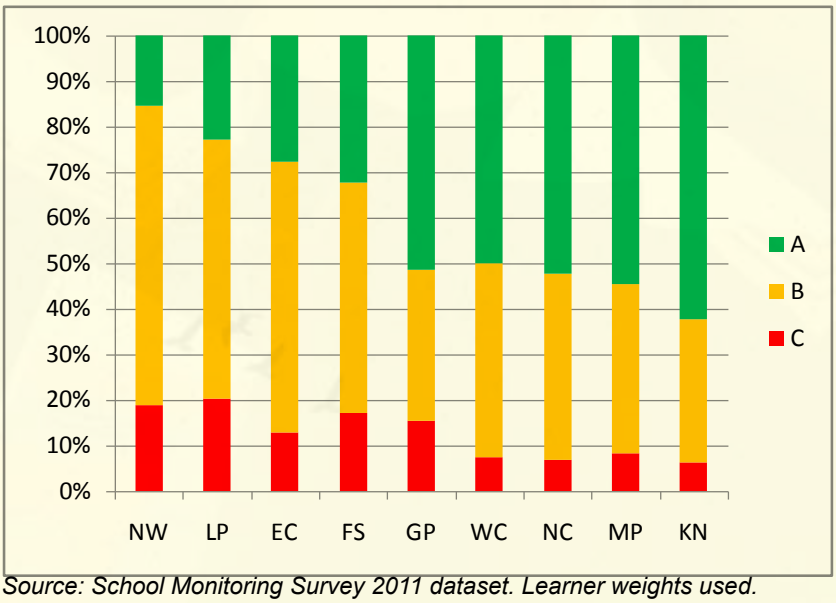
	Gr 6 lang	Gr 6 math	Gr 6 lang non-WB	Gr 6 math non-WB	Gr 9 lang	Gr 9 math
EC	3.0	4.9	3.0	4.3	3.0	4.4
FS	3.3	6.8	3.5	6.7	3.6	5.8
GP	5.0	7.6	5.0	7.3	4.3	7.2
KN	4.4	6.6	4.2	6.4	3.5	5.0
LP	4.0	6.2	4.0	5.8	3.3	5.9
MP	3.9	7.0	3.7	6.6	3.3	7.4
NC	3.8	6.9	3.3	5.4	3.2	6.0
NW	2.9	5.6	2.7	5.6	2.8	5.4
WC	5.2	7.6	4.6	7.4	3.6	7.4
SA	4.1	6.5	3.9	6.1	4.5	5.7
High	5.6	7.8	5.6	7.3	4.5	7.2

Source: School Monitoring Survey 2011 dataset. Learner weights used.

There are two simple questions relating to the marking of written exercises that the fieldworker had to answer after examining the learner books. Firstly, there is the question 'Does the educator provide any feedback in the books?' and, if there is feedback from the teacher, the fieldworker should indicate whether the teacher 'Only indicates correct and incorrect (i.e. ticks and crosses)' or 'Indicates correct and incorrect as well as comments'. This allows for a three-way classification for the quality of marking in each school. In the graphs that follow, the following applies: 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking. The marking data were not considered in the official SMS report, but they present a convenient means for assessing the depth of interaction between the teacher and learner. What is a bit surprising is that at the level of the

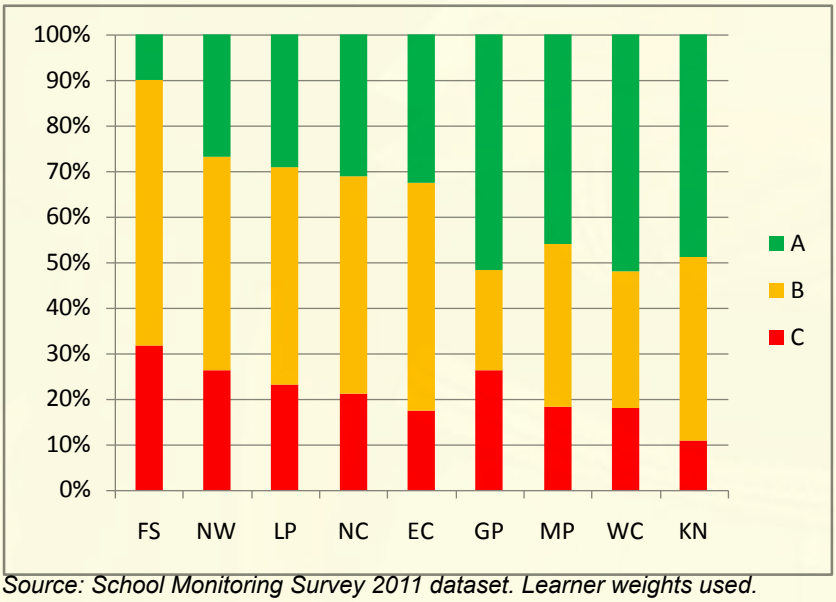
school there is no strong correlation between the quality of marking and number of exercises seen, though as shown in the graphs below, provinces with more exercises tend to have better quality marking (though there are some noteworthy exceptions). In the first four graphs, provinces appear in an order which reflects a single indicator score where 'A' carries 2 points, 'B' carries 1 point and 'C' carries zero.

Figure 14: Marking intensity of Grade 6 language teachers



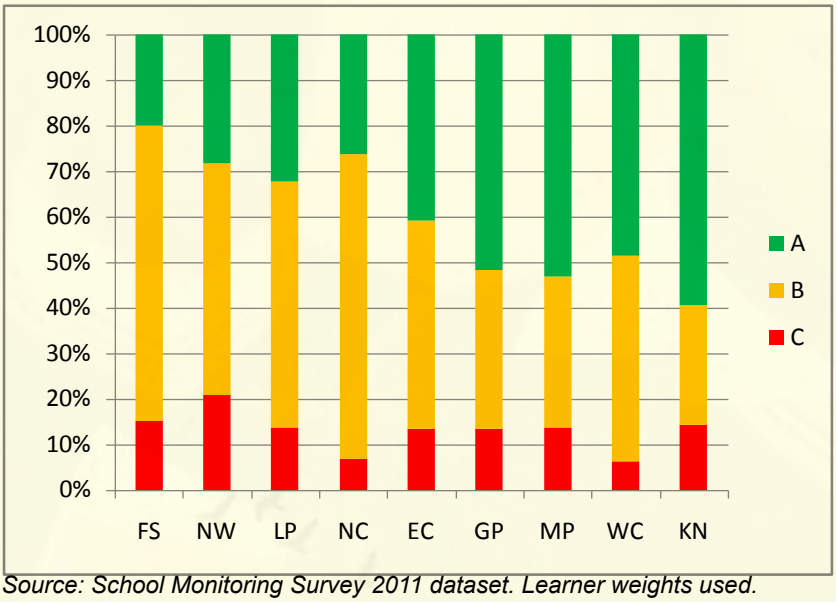
Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking.

Figure 15: Marking intensity of Grade 6 mathematics teachers



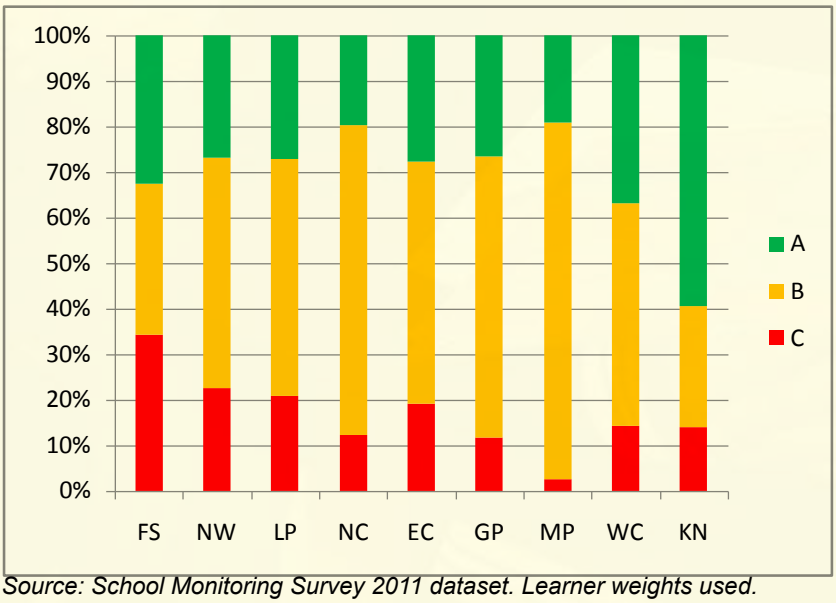
Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking.

Figure 16: Marking intensity of Grade 9 language teachers



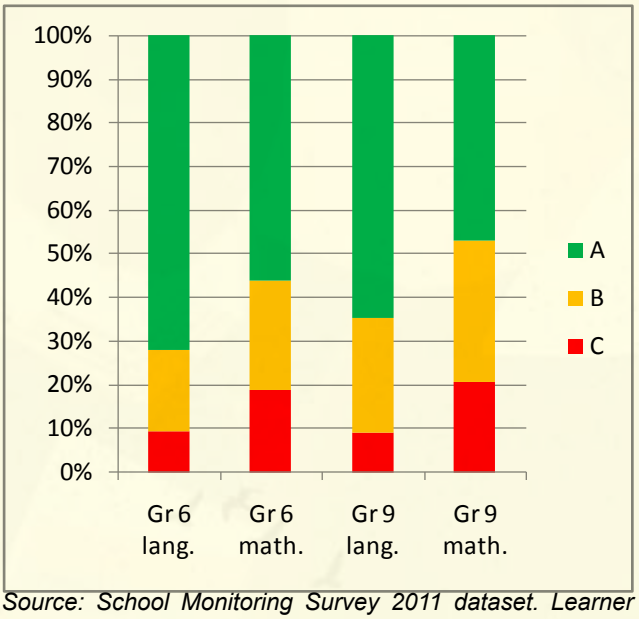
Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking.

Figure 17: Marking intensity of Grade 9 mathematics teachers



Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking.

Figure 18: Marking intensity in generally better performing schools

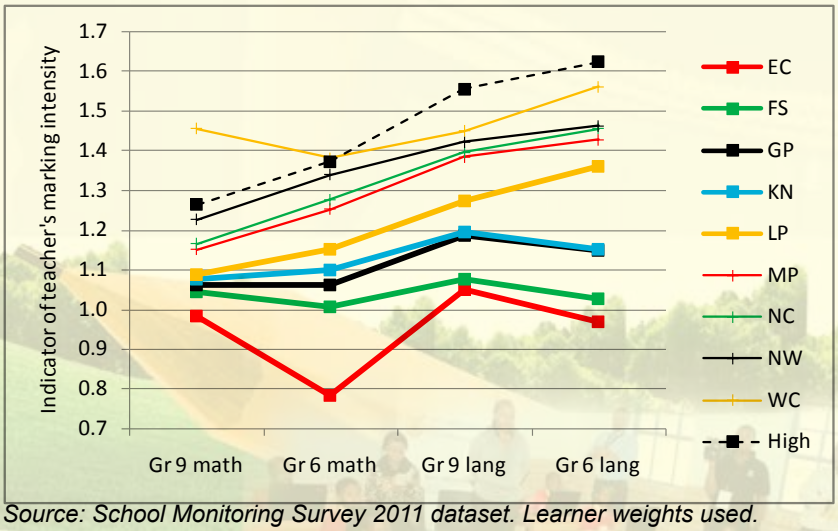


Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: Historically white and Indian schools considered here. 'A' is best and refers to marking that includes teacher's comments, 'B' is marking without any comments, and 'C' is no evidence of teacher marking.

What stands out in the above graphs is that a worryingly large proportion of schools display no marking at all. At the Grade 6 level, the problem is clearly worse for mathematics than language. Yet as Figure 18 shows, historically white and Indian schools are not immune to this problem. It seems unlikely that these statistics reflect measurement error given the simplicity of the data collection process. No marking should mean that no marking was seen at all in the writing books examined. This points to a breakdown of the basic functioning of the classroom. One should bear in mind that the books of a better performing learner were examined. That not even this learner should receive feedback in, for instance, over 30% of mathematics classes in FS should be cause for great concern. This should not be a difficult matter to fix. Teachers do not need much capacity building to perform basic marking. It is more a matter of accountability and discipline within the school.

Figure 19 below sums up the previous five graphs. The vertical axis refers to the indicator score discussed above. What is noteworthy is that NW performs well against this indicator, despite its poor performance in earlier graphs. GP does not perform well here, despite its high number of exercises seen in earlier graphs.

Figure 19: Summary of statistics from previous graphs on marking intensity



Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: Values refer to an index of marking intensity where a score of 2 is attached to marking that includes teacher's comments, 1 to marking without any comments, and 0 to no teacher marking. The curve 'High' reflects the situation in historically white and Indian schools.

Moving to the matter of coverage of core skills in the writing books, the official report grouped core skills into 'learning outcomes'. The analysis below retains the breakdown by core skill, but focuses mainly on Grade 6, partly because it is so problematic to interpret these data and returns to the analysis seem relatively low.

The full wording for the 17 core skills for Grade 6 mathematics appearing in the instruments used by the fieldworkers is as follows:

1. Basic calculations including rounding off, addition and subtraction of whole numbers, addition and subtraction of common fractions, multiplication, division, fractions, decimals, percentages, multiple operations
2. Solves problems that involve comparing two or more quantities of the same kind (ratio); comparing two quantities of different kinds (rate, e.g. wages/day)
3. Extends numeric and geometric patterns looking for a relationship or rules, including patterns
4. Writes number sentences to describe a problem situation
5. Recognises, visualises and names 2D shapes and 3D objects focusing on similarities of tetrahedrons and other pyramids, rectangles and parallelograms
6. Faces, vertices and edges; length of sides; angle size of corners
7. Transformations and symmetry
8. Draws and interprets sketches of simple 3D objects from different positions (perspectives)
9. Locates positions on a coded grid, describes how to move between positions on the grid, and recognises maps as grids
10. Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second including conversions
11. Estimates, measures, records, compares S.I. units with appropriate precision for mass using grams (g) and kilograms (kg); capacity using millilitres (ml) and litres (l); length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km); temperature using degrees Celsius scale
12. Recognises and describes angles
13. Uses simple data
14. Examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses)
15. Draws a variety of graphs including pictographs; bar graphs
16. Critically reads and interprets data presented in a variety of ways to draw conclusions and make predictions
17. Probability

There were virtually no schools where no core skill had been covered, according to the writing books seen. However, as seen in the following table, for almost all core skills in Grade 6 mathematics there were substantial proportions of schools where there was no exercise for that particular core skill. As has already been argued, one can expect a particularly high sensitivity of these statistics to whether books had been left at home and were thus not accessible to the fieldworker. Historically white and Indian schools also display significant proportions of learners not being able to display exercises on particular core skills. If one compares the three categories of schools in Table 16, what one does not find is a complete bias for or against particular core skills in one category relative to another category. Clearly historically white and Indian schools display better coverage across the core skills and rural schools display a fairly low level of coverage, but it is not as if, for instance, the more complex core skills are being completely ignored by less advantaged schools. What this points to is the importance of improving the depth of coverage in disadvantaged schools across all core skills. It is not a matter of focusing on one or two completely abandoned core skills.

Table 16: Core skills covered in Grade 6 mathematics

	All schools		High-end schools		Rural schools	
Core skill	Median exercises seen	% with nothing	Median exercises seen	% with nothing	Median exercises seen	% with nothing
Basic calculations	22	1	27	2	23	1
Ratios and rates	3	25	4	13	2	33
Numeric and geometric patterns	3	20	3	18	3	23
Written number sentences	3	25	4	17	2	32
2D and 3D shapes	3	17	4	10	3	21
Faces and edges	2	28	3	15	2	34
Transformations and symmetry	0	57	1	41	0	65

3D perspectives	1	50	2	32	0	58
Coded grids	0	60	1	47	0	68
Time	2	30	3	23	2	34
SI units	4	20	5	10	3	23
Angles	1	43	2	32	1	45
Data use	1	36	2	24	1	39
Central tendencies	1	49	2	34	0	54
Graphs	2	33	3	15	2	36
Data interpretation	0	66	0	50	0	70
Probability	0	77	0	66	0	80

Source: School Monitoring Survey 2011 dataset. Learner weights used.
Note: 'High-end schools' are historically white and Indian schools.

Table 17 below displays the median exercises seen per province and core skill. In this calculation of the median zero was considered (this also applies to Table 17). What is not displayed in the bottom row of Table 17 is the mean number of core skills covered by historically white and Indian schools. That figure is 10.6, in other words below or at the levels of four provinces. This seems to confirm that the bottom row values are somewhat problematic as indicators. But key patterns seen previously remain: WC performs well and EC performs poorly, for instance.

Table 17: Core Grade 6 mathematics skills by province

Core skill	EC	FS	GP	KN	LP	MP	NC	NW	WC
Basic calculations	13	23	39	25	23	18	23	24	17
Ratios and rates	1	4	4	3	3	5	2	3	4
Numeric and geometric patterns	2	3	5	4	4	4	1	4	4
Written number sentences	1	3	3	2	2	3	1	3	4
2D and 3D shapes	2	3	4	3	3	3	2	3	5
Faces and edges	2	2	3	2	2	2	2	1	3
Transformations and symmetry	0	0	0	0	0	0	0	0	2
3D perspectives	0	0	1	1	0	2	0	0	2
Coded grids	0	0	0	0	0	0	0	0	1
Time	1	1	2	3	2	2	2	2	3
SI units	3	4	4	5	4	3	2	3	5
Angles	1	0	1	2	2	2	0	0	2
Data use	1	1	1	2	1	2	1	1	2
Central tendencies	0	0	1	1	0	1	0	0	1
Graphs	1	2	2	3	1	3	1	1	2
Data interpretation	0	0	0	0	0	0	0	0	0
Probability	0	0	0	0	0	0	0	0	0
Mean skills covered	9.3	10.1	10.6	11.7	9.7	11.3	9.1	10.0	12.8

Source: School Monitoring Survey 2011 dataset. Learner weights used.

The National School Effectiveness Study (NSES), another large-scale data collection exercise run across all provinces except GP in the years 2007 to 2009, provides figures on the coverage of 'assessment standards' in the best learner's books which point to greater inter-provincial inequality than Table 17. For instance, three times as many assessment standards were covered in WC compared to EC[6]. This is a much larger differential than the one between these two

6 From a report by Stephen Taylor titled *Evidence from my working paper based on the National School Effectiveness Study.*

provinces in the last row of Table 17. This points to the sensitivity of this kind of analysis to the way questions are posed in the data collection instruments.

Moving to Grade 6 language, the following seven core skills are stated in the SMS instrument:

1. Handwriting exercises (cursive and/or print)
2. Language structure on word level
3. Language structure on sentence level
4. Language structure on paragraph level
5. Writing exercises consisting of work longer than a paragraph
6. Grammar exercises
7. Reading comprehension

The figures in the next table are perhaps more instructive than the corresponding Grade 6 mathematics figures. Above all, they confirm what much research has found, namely that socio-economically disadvantaged schools focus less on the writing of paragraphs and narratives longer than a paragraph. Whilst 5% of historically white and Indian schools did not display any work on 'More than a paragraph', the figure was 16%, or three times as bad, in rural schools.

Table 18: Core skills covered in Grade 6 language

	All schools		High-end schools		Rural schools	
Core skill	Median exercises seen	% with nothing	Median exercises seen	% with nothing	Median exercises seen	% with nothing
Handwriting	0	69	0	62	0	68
Word structure	7	6	10	6	6	6
Sentence structure	5	9	8	6	5	9
Paragraph structure	3	16	6	7	2	22
More than paragraph	4	11	7	5	3	16
Grammar exercises	9	5	12	1	8	6
Reading comprehension	5	8	8	3	4	11
Source: School Monitoring Survey 2011 dataset. Learner weights used. *Note: 'High-end schools' are historically white and Indian schools.*						

The values in the last row of the next table reflect the percentage of schools with either 'Paragraph structure' exercises or 'More than paragraph' exercises. The differences across provinces seem important for planning. EC, FS and NC need to pay special attention to ensuring that the production of more complex texts by learners is promoted. Again, the NSES provides starker figures on the problem. It was found that as many as half of EC schools did no paragraph writing.

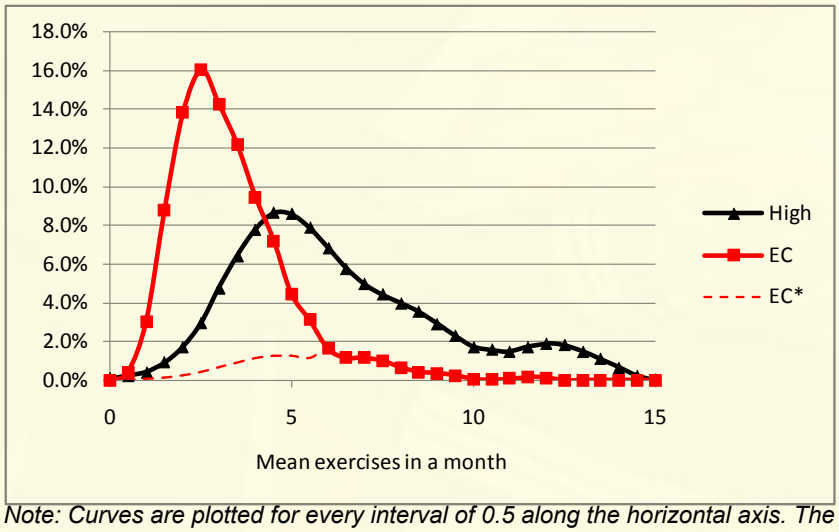
Table 19: Core Grade 6 language skills by province

Core skill	EC	FS	GP	KN	LP	MP	NC	NW	WC
Handwriting	0	0	0	0	0	0	0	0	0
Word structure	5	8	10	9	7	7	6	7	6
Sentence structure	4	6	6	7	5	5	3	6	3
Paragraph structure**	2	3	4	4	3	3	2	2	3
More than paragraph**	3	4	5	4	3	4	3	2	4
Grammar exercises	8	4	11	9	10	9	10	4	16
Reading comprehension	3	3	8	5	4	4	4	3	8
% with **	85.9	92.4	97.3	93.4	96.4	95.4	92.6	95.9	98.1
Source: School Monitoring Survey 2011 dataset. Learner weights used.									

The indicator that has prompted the above analysis reads as follows: 'The percentage of learners who cover everything in the curriculum for their current year on the basis of sample-based evaluations of records kept by teachers and evidence of practical exercises done by learners'. Is there some way in which the preceding analysis can be condensed to produce indicator values more or less in line with this indicator definition? The official SMS report tackled this problem by finding the percentage of learners, by grade and subject, who fulfilled the criteria of at least four exercises seen for a week. This resulted in some extremely low indicator values, even for relatively well performing provinces, for instance 12% and 11% for GP and WC in the case of Grade 9 mathematics. Such values are counter-intuitively low. In one respect the approach of the official report is sensible. It does make sense to place a special focus on the number of exercises done in a period. As has been seen in the above analysis, examining core skills covered does not result in very meaningful comparisons across provinces, partly because the problem in schools is not so much *what* is covered but the *depth* of the work done and *level of effort* invested, and partly because the core skills data are particularly susceptible to measurement error. Focussing on how much work is done, in the form of written exercises, thus seems like an effective way of gauging the extent to which the curriculum will be properly covered. However, for various reasons the benchmark is not so much a point measure, as in four exercises a week, as a distribution, for instance the distribution of 'Books best' in Figure 7. This benchmark distribution is moreover different for different grades and subjects. The question then is how the proximity of one distribution to another can be captured in a single statistic. A proposal for doing this is provided below. This type of calculation may be useful for a variety of indicators, not just the curriculum coverage indicator.

In Figure 20 below, the distribution of the Grade 6 language exercises seen values (so values illustrated in Figure 8) are given for historically white and Indian schools ('High') and EC schools. The curve 'EC*', which partly follows the curve 'EC', indicates the learners that can be considered to have reached the benchmark standard of the curve 'High'. Two criteria are used. Firstly, for any point along the horizontal axis that is greater than or equal to the median value for 'High' (this median is 5.6), EC learners are considered to have reached the benchmark level. Secondly, to the left of the median, some EC learners are considered to have reached the benchmark level, even if they have not reached the median value of 5.6, in recognition of the fact that even amongst learners represented by 'High', some values fall below the median. Put differently, the curve 'EC*' is allowed to continue to the left of 5.6 but only to the extent that values to the right along 'EC*' permit this.

Figure 20: Calculation of curriculum coverage value for EC



Note: Curves are plotted for every interval of 0.5 along the horizontal axis. The curves are kernel density curves with values along the vertical axis converted to the percentage of weighted learners who have values along the horizontal.

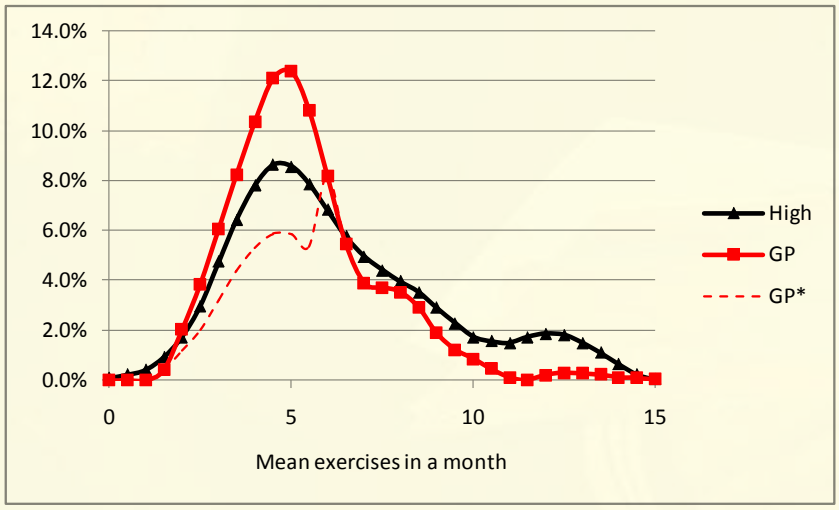
The area below the curve 'EC*' divided by the area below the curve 'EC' is 14.5%. Thus 14.5% of learners in EC would be considered to have complied with a benchmark derived from better performing schools. The formula for obtaining the height of the 'EC*' curve to the left of the median (in this instance 5.6 along the horizontal) is as follows:

$$y_{x,E^*} = \min\left(\left[y_{x,E}\right], \left[\frac{y_{x,High}}{\sum_{w=n}^{x+d} y_{w,High}} \times \sum_{w=n}^{x+d} y_{x,E^*}\right]\right) \quad (2)$$

Here *n* is the maximum value along the horizontal axis (39 in Figure 20, though this is off the graph), *x* and *w* refer to a selected value along the horizontal axis, *y* refers to a selected value along the vertical axis (which must be the percentage of learners with value *x* along the horizontal), and *d* refers to the interval between points, illustrated as markers in the curves, along the horizontal axis (0.5 in Figure 20). It might be easier to follow the approach by looking at the calculations done in Excel for this exercise.

The calculation for GP (also Grade 6 language) is illustrated in the next graph. The indicator value would in this case be 67.3%.

Figure 21: Calculation of curriculum coverage value for EC



The next table provides the indicator values for all provinces for all four grade-subject combinations, as well as the averages across the four grade-subject combinations. It is this average in the last column that can be considered a composite indicator value for each province, and the country. If one followed the same approach after future data collections, indicator values would reflect reductions in the inequality between provinces and the benchmark, but what these values would not take into account is absolute improvements across the entire system, including amongst the category 'High'. This obviously limits the utility of the indicator for comparisons across time. However, just tracking reductions in inequality over time would on its own be a useful monitoring exercise.

Table 20: Summary indicator values for curriculum coverage

	Gr 6 lang.	Gr 6 math.	Gr 9 lang.	Gr 9 math.	Average
EC	14	34	25	34	27
FS	31	72	32	60	49
GP	67	93	84	94	85
KN	49	78	48	41	54
LP	37	53	25	67	46
MP	35	76	49	97	64
NC	62	74	19	29	46

NW	20	35	7	34	24
WC	81	86	42	95	76
SA	43	67	39	62	53

What the analysis tells us about improving measurement

As argued in the full version of the *Action Plan,* of the 36 sector indicators, the indicator on curriculum coverage is probably the most difficult one to implement. The 2011 SMS represented an important step forward for measuring curriculum coverage and presents important lessons for future monitoring.

The monitoring of the volume of written work and the intensity and type of teacher feedback seems particularly important for understanding curriculum coverage. Coverage of topics in the curriculum is also important, but for practical reasons it is far more difficult to get this right and the challenge in the classroom seems to be more a matter of increasing the level of effort of learners and educators than to redistribute efforts across topics. In future data collections, the data on exercises done could be improved through a few simple enhancements that clarify what was seen by fieldworkers. Specifically, a few questions on the total number of pages of exercise books monitored, the size of the books (A4 or A5), and the number of words on a typical full page would help. More details on the teacher's feedback would also help, in particular the rough percentage of the work that has been marked, whether grammar and spelling are corrected and whether the teacher's marking is correct in the case of a few selected mathematics exercises.

What the analysis tells us about improving our plans

The 2011 SMS should serve as a model and point of departure for the monitoring of curriculum coverage on an ongoing basis by a variety of actors, in particular school principals and district officials. A key question is what instructions and tools exist at the school and district levels to do this work. Key policy documents in this regard are the Curriculum and Assessment Policy Statement (CAPS) and policies on the roles and functions of districts.

The CAPS do establish certain standards for the volume of work. For instance, the Grade 6 Intermediate Phase mathematics CAPS indicates that there should be two formal assessments in each school term and provides a breakdown of the types of formal assessment required (on p. 225). However, there does not seem to be specific guidance on the number of written mathematics exercises learners should perform in, say, a week. Such guidance may exist in other policy document, possibly produced by the district or province. A key challenge is to get to understand whether such guidelines exist and whether they are realistic and useful in establishing clear and workable accountability lines between the teacher and the school principal, and the school and the district.

The 2011 *Guidelines on the organisation, roles and responsibilities of education districts* provide a point of departure for the generation and dissemination of monitoring and support tools to be used by district officials in, for instance, improving curriculum coverage in schools. However, what must still become entrenched in the South African school support culture is the notion that tools need to be developed through a rigorous process, which should include piloting, that training in the use of tools is needed, and that both informal and more formal ways of assessing the impact of these tools on educational improvement is required. The following 2012 milestone in the *Action Plan* needs to be resuscitated: 'New tools and specifications to guide districts in monitoring and supporting schools in a more holistic fashion, with a partial focus on completing the required programmes within the year, are developed and tested in selected districts and schools.'

4.2 Indicator on district support services

The full numbering and wording of this indicator is as follows:

4.2.1. The percentage of school principals rating the support services of districts as being satisfactory

Summary for this indicator

Nationally, in 2011 96% of schools were visited at least once by the district (or circuit) office, and 88% were visited at least twice. Average visits per year varied by province from 4.6 visits in the case of EC to 10.0 in FS. The least visited schools are those in EC and LP. Very importantly, the more historically disadvantaged a school is, the less it is visited. It should be the other way round. Yet the difference is worrying rather than enormous: average visits per school is 6.1 for quintile 1 against 7.9 for quintile 4.

If one examines school principal levels of satisfaction with district visits, one finds that the poorer the quintile, the lower the level of satisfaction. For instance, 24% of quintile 1 school principal responses are 'not satisfied', against 11% in quintiles 4 and 5. If one views this statistic by province, worst are EC and NW with 32% and 29% of responses being 'not satisfied', whilst the best provinces are GP and MP (both 9%) and WC (just 4%).

A method for calculating indicator values is presented that takes into account both average level of satisfaction and the number of monitoring and support areas that were covered during district visits. In other words, both satisfaction and comprehensiveness are taken into account. The lowest indicator value seen is that of NW, whilst GP and WC emerge as relatively good performers.

Qualitative responses from school principals indicate that dissatisfaction is often associated with a tendency amongst officials to check compliance in a superficial manner, without due consideration for the complexities of managing a school. Moreover, district officials are often seen as poorly equipped to advise on matters relating to learner behaviour, including drug abuse. This is reported by principals across most, if not all provinces.

Detailed analysis

The 2011 School Monitoring Survey asked the school principal a number of questions regarding the quantity and quality of visits by 'district officials' to the school. The questionnaire made it clear that 'district official' could mean someone from a district office or a circuit office. The first two questions were 'Has your school been visited by any district/circuit officials this year?' and 'How many visits has the school received this year from district officials for monitoring and support purposes?'. The second question relates directly to one of the *Action Plan* indicators, which is 'The percentage of schools visited at least twice a year by district officials for monitoring and support purposes'. Responses to the two questions are reflected in the table below. Unless otherwise indicated, in this analysis of district support schools and not learners are counted. The 96% total value in the first column of the table thus refers to the percentage of schools, not the percentage of learners in visited schools. The values in the middle column are around 10 percentage points higher than the corresponding figures for 2007 published in the *Action Plan.* Those figures were based on 2007 National School Effectiveness Study (NSES) data. Given that the data collection methods differed somewhat across the two sources, it is not possible to conclude that there has been an improvement between 2007 and 2011. Specifically, in both data sources number of visits was grouped in bins, but the bins were different in the two surveys. For instance two visits had its own bin in the 2011 data whilst in the 2007 data one had to rely on a 'two or three times' bin. What is significant, however, is that in both the 2007 and 2011 data values for EC and LP are low. For the last column in Table 21, '3 to 6' visits was counted as four visits, '4 to 7' visits was counted as 9 visits and 'more than 12' was counted as 15 visits. The averages in the last column illustrate rather well how large the gaps are between provinces. For instance, schools in EC are visited only half as much as schools in FS, GP and MP.

Table 21: Percentage of schools experiencing district visits

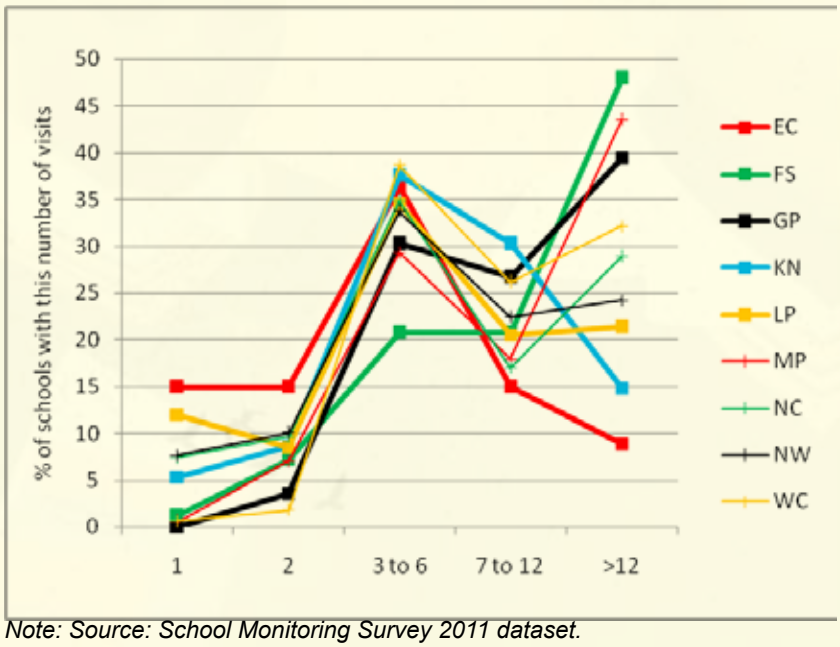
	Visit by an official during the year	At least 2 visits during the year	Average visits in the year
EC	90	75	4.6
FS	98	96	10.0
GP	100	100	9.6
KN	97	91	6.7
LP	97	85	6.7
MP	98	98	9.5
NC	98	90	7.5
NW	98	91	7.3
WC	99	99	8.8
SA	96	88	7.0

Source: School Monitoring Survey 2011 dataset.
Note: For the averages in the final column, zero visits for a school was included in the calculation.

Figure 22 illustrates the breakdown across the response categories by province. A large part of the reason why indicator values for LP and EC are low is that highly intensive interaction in the form of seven or more visits in a year is

comparatively rare in these two provinces. To some extent, the same applies to KN.

Figure 22: Distribution of number of visits by province



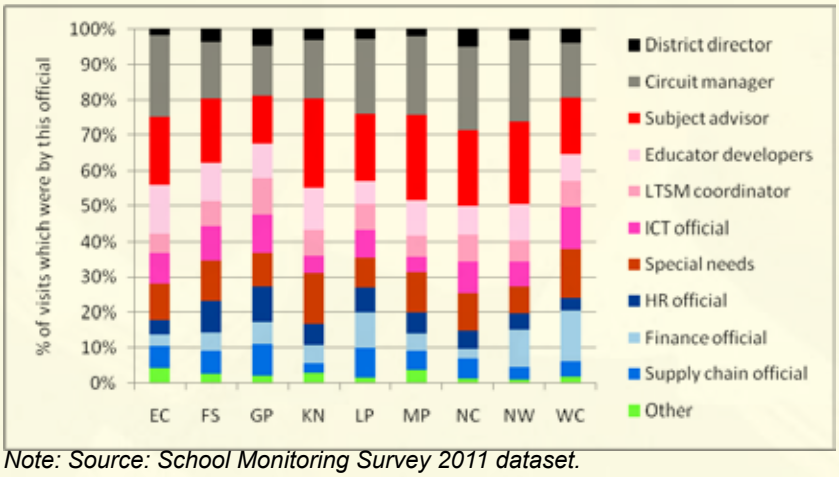
Note: Source: School Monitoring Survey 2011 dataset.

An important pattern revealed by a breakdown according to the pre-1994 department is that historically white schools receive slightly more visits than other schools. One sometimes hears the argument that historically white schools are, in a sense, left alone by district offices so that districts can concentrate their resources on historically black schools. This is clearly not supported by the data. If a breakdown is made according to an urban-rural variable found in the SMS dataset, one finds that urban schools are more visited than rural schools. This is not surprising given larger distances in rural areas. In fact, the difference in terms of average visits per year is around two visits when one compares the urban to rural averages. As was seen in Table 21, the national average is 7.0 visits a year. A gap of two visits between urban and rural schools is not very large. In fact, even under ideal circumstances, one might expect officials in rural areas to rationalise their visits to remote schools by performing more tasks within each visit. Clearly the data do point to some under-servicing of more remote schools, yet rural schools are undoubtedly receiving some attention and are not ignored. In EC what is noteworthy is that ex-Ciskei schools are more visited than ex-Transkei schools. The averages for the two categories are 5.3 and 3.8 visits a year. The 3.8 figure for ex-Transkei schools is the lowest of all the ex-department averages.

A breakdown by quintile reveals a steady increase from 6.1 visits per year for quintile 1 schools to 7.9 visits for quintile 4 schools (for quintile 5 the average is 7.7). Assuming that schools in the poorest areas should receive the most district support, what is in fact occurring is the reverse of what should be occurring. Those most in need receive less attention.

The questionnaire asked what categories of officials visit schools. School principals could answer yes or no to each of the 11 categories illustrated in the next graph. However, they could not indicate the number of visits performed by each type of official so statistics in the graph simply reflect the number of 'Yes' responses. Patterns are fairly similar across provinces. In general, district or circuit managers account for around 20% of responses, 60% are accounted for by other officials focussing on more educational matters (shades of red in the graph), whilst 20% is accounted for by officials with a more administrative or logistical focus (shades of blue).

Figure 23: Types of officials visiting schools



Note: Source: School Monitoring Survey 2011 dataset.

The official Delivery Agreement indicator referred to above deals not with the quantity of visits, but their quality, specifically the satisfaction felt by school principals. Measuring satisfaction, whilst important for understanding the dynamics of the schooling system, should occur with a proper appreciation of a number of risks. One risk is that school principals will be reluctant to criticise their superiors in the district office, even if the survey is being conducted by non-department fieldworkers. Another is that school principals who do not fully understand what kinds of interventions they need are less likely to express informed professional judgements about the work of the district. For instance, an unmotivated school principal may be completely satisfied with district officials who do not challenge him or her. On the other hand, districts that seriously tackle ill-discipline in schools may elicit very negative responses from schools in a satisfaction survey. Thus a lack of satisfaction does not always mean that districts are ineffective. As will be seen below, the survey also revealed that it can be difficult to separate the principal's assessment of the professional commitment of district officials from general issues around funding and resourcing which are beyond the control of the officials. Put differently, a dedicated district official may not elicit a 'satisfied' response from a school principal if the latter believes that the school can and should receive more public funding. To some extent, this latter risk could be dealt with in future through some rewording of the survey questions.

The school principal was asked to rate district action according to 10 monitoring areas (see items 1 to 10 in the list below) and 11 support areas (items 11 to 21). For each area, the school principal indicated whether this area was dealt with in the 2011 school year, and if the response was 'Yes', a rating occurred using the following four categories: 'Not satisfied', 'Somewhat satisfied', 'Satisfied', 'Very satisfied'. Of the 2005 school principals who were meant to be interviewed as part of the survey, 92% answered 'Yes' to at least one of the 21 areas, the average number of 'Yes' responses being 10.8 out of a possible maximum of 21 (for this average a zero response rate was not considered). If one divides, at each school, the number of 'Yes' responses by the number of visits, the median ratio obtained is 1.7 areas per visit. What is thus clear is that in the minds of respondents there could be more than one area dealt with per visit (the design of the questionnaire implicitly supported such an assumption). If one considers all ratings, 17% reflected 'not satisfied', 11% reflected 'somewhat satisfied', 61% reflected 'satisfied', whilst 10% reflected 'very satisfied'. There thus appears to be enough variation in the responses to support a meaningful analysis.

The list of monitoring and support areas, as they appear in the questionnaire, follows.

1. Checking management and/or financial documents, including school policies, registers
2. Checking educator planning and preparation documents
3. Checking school assessment records, e.g. promotion and term schedules
4. Checking educator assessment records
5. Checking school infrastructure including maintenance
6. Checking LTSM management (ordering, control and retrieval)
7. Checking the SGB, including election of members
8. Validation of EMIS information
9. Checking HR matters (e.g. staff appointments, grievance matters)
10. Checking matters related to learner discipline
11. Supporting educators in his/her class teaching
12. Supporting and assisting principal in performing the duties of school principal
13. Supporting and assisting other SMT members
14. Supporting learners
15. Supporting administrative staff
16. Supporting of school-based support team (SBST)/institutional level support team (ILST) to identify learners with special educational needs

17. Supporting of school governing body (SGB)
18. Supporting of school assessment team (SAT)
19. Supporting of health and safety team in incidents related to health and safety
20. Supporting of Representative Council of Learners (RCL)
21. Supporting of LTSM committee

What stands out from the following table is relatively high levels of dissatisfaction with the monitoring of infrastructure, monitoring and support relating to LTSMs[7] and areas to do with learner behaviour (discipline, special needs, the RCL). One suspects that the infrastructure and LTSM problems relate to systemic and funding issues beyond the control of the district officials, as opposed to how well district officials perform given the available resources. However, even key areas that would be strongly related to what district officials do are poorly viewed by school principals. In particular, pedagogical advice seems not to be widely valued judging from the fact that 30% of principals view area 11, 'Supporting educators in his/her class teaching', as less than satisfactory.

Table 22: Satisfaction across 21 areas

	% with this	% not satisfied	% somewhat satisfied	% satisfied	% very satisfied
1. Management docs	73	8	11	69	12
2. Educator planning	74	9	12	68	11
3. Promotion schedules	69	8	7	72	13
4. Educator assessment	70	9	9	71	11
5. Infrastructure	53	30	14	48	8
6. LTSM	41	23	12	58	7
7. SGB	52	15	8	66	10
8. EMIS	51	14	10	63	12
9. Human resources	37	25	11	55	9
10. Learner discipline	33	29	9	54	8
11. Class teaching*	59	16	14	60	10
12. Principal*	69	11	12	64	13
13. SMT*	55	16	14	61	10
14. Learners*	42	25	14	51	10
15. Admin staff*	35	29	10	52	9
16. Special needs*	37	30	14	48	8
17. SGB*	44	23	11	58	8
18. Assessment team*	46	20	12	61	7
19. Health and safety*	46	23	14	55	8
20. RCL*	21	36	11	48	6
21. LTSM*	32	30	12	53	6

Source: School Monitoring Survey 2011 dataset.
*Note: * denotes that the area is about support (as opposed to monitoring).*

The following table points to an important problem. Not only are poorer quintiles receiving fewer visits, as discussed above, poorer quintiles also express more dissatisfaction with the visits that they do experience. For instance, 24% of responses from quintile 1 school principals reflect 'not satisfied', against 11% for quintile 4. This pattern of more disadvantaged schools valuing support less is not one that always emerges. For instance, SACMEQ 2007 data reveal that teachers who perform worst in teacher tests tend to attach the greatest value to the available in-service training[8].

7 Learning and teaching support materials, largely textbooks and workbooks.
8 See report titled *Teacher in-service training policy and programmes in South Africa* (dated 6 August 2012), forming part of a set of reports within a UNICEF-funded public expenditure analysis for the DBE.

Table 23: Satisfaction by quintile

Quintile	% not satisfied	% somewhat satisfied	% satisfied	% very satisfied	Total
1	24	11	57	8	100
2	20	12	61	7	100
3	17	11	62	10	100
4	11	15	62	12	100
5	11	10	61	18	100
Total	19	11	60	10	100

Turning to levels of satisfaction by province, the next table points to large inter-provincial differences. As many as one-third of responses in EC reflect 'not satisfied', against just 4% in WC.

Table 24: Satisfaction by province

	% not satisfied	% somewhat satisfied	% satisfied	% very satisfied	Total
EC	32	11	52	5	100
FS	12	10	63	15	100
GP	9	9	67	14	100
KN	17	15	60	8	100
LP	21	10	60	10	100
MP	9	13	65	13	100
NC	13	12	68	6	100
NW	29	10	55	6	100
WC	4	12	67	17	100
SA	19	11	60	10	100

Table 25 indicates which provinces stood out as particularly positive or negative with respect to the 21 areas. Specifically, a province is mentioned in the table if the provincial average is higher or lower than the national average by 1.5 standard deviations or more, where the standard deviation is measured across the nine provincial averages. Dissatisfaction in EC but also NW is particularly prominent, as is high levels of satisfaction in GP and WC.

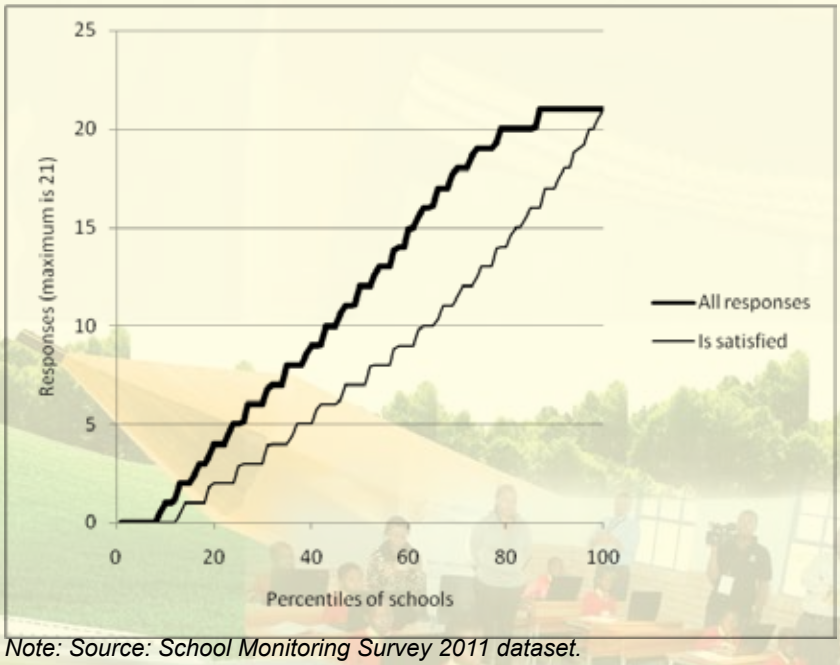
Table 25: Provinces standing out as positive or negative

	% with this is exceptionally low	% not satisfied is exceptionally high	% very satisfied is exceptionally high
1. Management docs			WC
2. Educator planning	EC	EC	WC
3. Promotion schedules		EC	WC
4. Educator assessment	EC	EC	WC
5. Infrastructure		NW	
6. LTSM		NW	GP
7. SGB		EC	

8. EMIS		NW	
9. Human resources		EC	WC
10. Learner discipline			WC
11. Class teaching*	EC	EC	
12. Principal*		NW	WC
13. SMT*		EC	WC
14. Learners*		EC NW	
15. Admin staff*			
16. Special needs*			
17. SGB*			
18. Assessment team*		EC	
19. Health and safety*		NW	
20. RCL*	KN	EC	MP
21. LTSM*			GP

How should indicator values be derived from the data? The official SMS report counted a school principal as satisfied if he or she expressed satisfaction (just 'satisfied' or 'very satisfied') with respect to at least 11 areas in the list of 21 areas. This approach has two weaknesses. Firstly, it considers 'not satisfied' to be the equivalent of 'somewhat satisfied', and 'satisfied' as being equal to 'very satisfied'. The resultant indicator values do thus not take full advantage of the range of values in the data. Secondly, and more seriously, the approach produces values which to a large degree reflect how many areas were dealt with in the district visits, as opposed to the quality of the visits. As suggested by Figure 24 below, even if all principals expressed only satisfaction, just around 50% would be considered satisfied using the official report's approach, simply because around half of school principals answered fewer than 11 questions. How to resolve these issues is a debatable matter. The approach described below represents an attempt to balance quality and quantity. Quantity cannot be entirely ignored. Presumably a school principal who received support in just three areas, and was satisfied with all three, would be less satisfied in an overall sense than a principal who received support in 20 areas, and was satisfied with all 20.

Figure 24: Distribution of responses across schools



Note: Source: School Monitoring Survey 2011 dataset.

Columns A to C in the next table present different approaches that all take into account only quality (and thus not the

number of areas dealt with). Column A is the sum of the 'satisfied' and 'very satisfied' columns in Table 24. For column B, six of the 21 areas which seemed closely linked to the overall level of resourcing were dropped. The fact that this resulted in slightly higher levels of satisfaction in column B, compared to column A, seems to confirm the notion that levels of resourcing influenced responses. Column C represents an approach where an average was calculated for each school and where 'not satisfied' carried a zero value, 'somewhat satisfied' was 0.8, 'satisfied' was 1.0 and 'very satisfied' was 1.1. If the average level of satisfaction in a school was 1.0 or more, then the school was considered satisfied in an overall sense. Clearly this approach is rather stringent in that 'not satisfied', even in a few areas, strongly reduces the probability that a school will be considered to be overall satisfied. But this stringency seems justified in the sense that it should be the aim for all types of support and monitoring to be satisfactory in the eyes of the school principal. For the column D values, school values calculated for column C were adjusted upwards in accordance with how many of the 21 areas reflected a valuation of at least 'satisfactory'. The calculation method is given in equations (3) and (4). Here s is the school value, R_0 is the number of 'not satisfied' responses, R_1 is the number of 'somewhat satisfied' responses, and so on, w refers to the four weights referred to above (0.0, 0.8, 1.0 and 1.1) and f_1 and f_2 refer to the adjustment factors to take into account the number of areas dealt with. The equation for f_2 is provided as an illustration. The value f ranges from 1.0 to 1.1.

Table 26: Arriving at indicator values

	% of responses which reflect at least 'satisfactory'		% of schools with enough 'satisfactory' responses	
	A	B	C	D
	All responses considered	Resource-focussed questions excluded	All responses given a weight	As for C, but with weights for number of 'satisfactory' responses
EC	58	62	39	48
FS	78	81	39	49
GP	82	83	47	62
KN	69	72	43	48
LP	69	74	45	50
MP	77	80	37	47
NC	75	77	45	53
NW	61	67	24	31
WC	85	86	50	67
SA	70	73	41	50

$$s = \frac{R_1 w \ + R_2 w_2 f_2 + R_3 w_3 f_3}{R_0 + R_1 + R_2 + R_3} \quad (3)$$

$$f_2 = 1 + \frac{R_2}{\mathbf{1}} \times 0.1 \quad (4)$$

The values in column D seemed to provide the best measures for the official indicator.

Finally, the SMS dataset captured reasons why school principals were not satisfied. One hundred schools were selected randomly from the approximately 600 schools which had this qualitative data and the responses of the 100 schools were examined. What emerged was a clear division between schools complaining mainly about how seldom officials visited and schools complaining mainly about what officials did when they visited. The former group made up around 60 of the 100 schools. What this suggests is that schools do value district visits. Schools do not want to be left alone, it seems. Amongst the 40 or so schools complaining about what happened during visits, complaints commonly had to do with officials who just worried about compliance with rules in a superficial sense, without displaying a proper understanding of the complexity of managing a school. It was moreover common for schools to complain about promises being made by officials and then not being kept. There was often no follow-up of initial work or discussions. Importantly, many principals complained that officials were ill-prepared to advise on matters relating to the social problems of learners, including drug abuse. Concerns around drug abuse were distributed across all provinces and were not particular to just the more urban

provinces of GP and WC.

What the analysis tells us about improving measurement

One thing that future surveys could do better is to separate resource constraints from poor behaviour or capacity amongst district officials. For instance, the principal could be asked how true the following: 'The district officials I am in contact with appear to do their job to the best of their abilities and are truly concerned about improving the quality of schooling.'

What is missing in the 2011 SMS is a few questions dealing with the principal's overall level of satisfaction with the work performed by districts. Breakdowns according to specific areas of support are important, but obtaining an overall picture is often best done through questions dealing with overall satisfaction, as opposed to aggregation across different areas (as was done above).

Whilst data collected through relatively large-scale surveys, such as the SMS, are valuable, what is missing in the South African monitoring landscape is more case studies of the effectiveness of districts. Existing studies focus largely on what additional resources districts should be given, without paying sufficient attention to what districts currently do with the resources they have. It is only by understanding current practices that one gains a proper picture of the likely impact of putting additional resources into districts. Additional resources on their own are no guarantee of better district support.

What the analysis tells us about improving our plans

The 2011 *Guidelines on the organisation, roles and responsibilities of education districts* capture the basic position of the authorities with respect to education districts. The 2011 SMS, but also the *Action Plan*, point to issues which are probably under-emphasised in our plans and policies regarding districts.

It seems important to provide better guidance on how to prioritise district support work. Even if the resourcing of districts is improved, the range of activities that people will believe are necessary will almost certainly exceed what can be done with the available human capacity and budget. What then should guide the prioritisation of activities? The overriding goal should always be to improve learning outcomes in schools. This means that plans need to explicitly acknowledge that we face a crisis with respect to what learners learn in schools. It also means that whether particular activities promote better learning and teaching should be a prominent concern and that the effectiveness of the various district activities need to be assessed on an ongoing basis through a variety of tools, for instance surveys such as the 2011 SMS.

Plans could pay greater attention to what is currently wrong with district support and what existing research shows. There thus needs to be a stronger emphasis on not perpetuating bad practices. In this regard it is particularly important that the 2011 SMS data point to the need to emphasise deepening the professional skills of district officials and avoiding the trap of a superficial compliance culture. Undoubtedly basic compliance is vital in certain areas, for instance teacher attendance at school. But other areas of compliance, for instance where school principals must submit reports even if there is no feedback to schools, are more open to questioning. The 2011 SMS finding that district officials need to become better at advising schools on how to deal with learner behaviour problems is important.

Annexure: Summary of indicator information

UPDATE ON PROVINCIAL INDICATOR VALUES AND RELATED MATTERS										
	EC	FS	GP	KN	LP	MP	NC	NW	WC	SA
1.2.1. The percentage of learners having access to the **required textbook and workbooks** for the entire school year. [See Table 10] *Values refer to 2011.*	68	55	67	55	54	52	64	67	84	61
Observations linked to the above indicator										
In more than 10% of quintiles 1 to 3 schools no Grade 6 mathematics book (workbook or textbook) could be seen in the classroom. [See Table 4.]	✗	✗				✗				
In more than 30% of quintiles 1 to 3 schools no Grade 9 mathematics textbooks could be seen in the classroom. [See Table 5.]		✗		✗		✗	✗			
4.1.1. The percentage of learners who **cover everything in the curriculum** for their current year on the basis of sample-based evaluations of records kept by teachers and evidence of practical exercises done by learners. [See Table 20.] *Values refer to 2011.*	27	49	85	54	46	64	46	24	76	53
Observations linked to the above indicator										
Level of effort in the classroom as demonstrated by exercises done per month in learner writing books. [See Table 20.]	✗		✓	✓		✓		✗	✓	
Presence and quality of teacher marking. [See e.g. Figure 15 and Figure 17.]	✗									
Extent to which the writing of longer texts by learners occurs in the language class. [See Table 19.]	✗		✓						✓	
4.2.1. The percentage of school principals rating the **support services of districts** as being satisfactory. [See Table 26.] *Values refer to 2011.*	48	49	62	48	50	47	53	31	67	50
Observations linked to the above indicator										
Percentage of schools visited at least twice a year. [See Table 21.]	✗		✓		✗	✓			✓	
Number of visits in a year. [See Table 21.]	✗	✓	✓			✓				
Proportion of school principal responses reflecting ‘not satisfied’ and ‘very satisfied’. [See Table 24.]	✗	✓	✓					✗	✓	

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