

# Final summary report for the schooling sector data use project

*Final report of 28 February 2017*

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## EXECUTIVE SUMMARY

The current summary report forms part of a larger project examining **problems and solutions in the collection and use of data in provincial education systems** in South Africa. This report draws from a number of other reports, in particular a literature review, two province-specific reports covering Western Cape and KwaZulu-Natal, and a report focussing on optimal Grade 12 performance indicators.

Section 1 lists the other reports forming part of the larger project.

Section 2 explains what desktop work, and **interviewing of people** at the national, provincial, district and school levels fed into the various project reports. Moreover, it explains who was consulted in relation to overall findings and recommendations.

Section 3 discusses the **main findings**. Findings which seem globally applicable (at least as far as developing countries are concerned), and at the same time applicable to South Africa, are the following:

- The **human element** is a vital ingredient of good information systems.
- **‘White elephant’ systems** are a universal problem.
- Being clear on the desired degree and nature of **school principal agency** is vital for developing the right systems.
- Three related technical issues must be tackled properly when **gauging the educational progress of schools** (or education systems): (1) **Selection effects**, (2) **socio-economic status**, and (3) the **equivalence of tests**.
- **School report cards** have become popular around the world for good reasons.

The following findings are more South Africa-specific:

- **Uncertainty around school principal powers** can complicate the design and implementation of information systems.
- Many existing systems suffer from a **lack of relevant documentation**, including policy on the system’s strategic function.
- Even **taking advantage of the power of the internet** in a ‘piecemeal’ fashion is better than not using this power at all.
- **Strong organisational centres** are important.
- Much activity around data generation and use is oriented to **‘blind compliance’** as opposed to **smart compliance** aimed at adding value to service delivery.
- **Auditing of the quality of data** has occurred, but has been weak and infrequent.
- The importance of analysing **raw ‘microdata’** is often not appreciated.
- **Knowledge management systems** are weak.

Section 4 outlines **14 recommendations**, grouped according to who in the education departments should drive the innovation. Two recommendations, namely **recommendations 5 and 7, are particularly important for the sector**, and are hence marked with stars below.

The details for each recommendation include suggestions on how far into the future the recommendation should be carried through, keeping in mind that not everything can be prioritised at once. As far as possible, the details include concrete things that should be achieved, such as the institutionalisation of specific reports (possibly in the form of improvements on existing reports), information tools, and the establishment of specific organisational structures.

1. **Strengthen the understanding of key education data concepts** amongst leaders and senior managers.
2. Ensure that the development of the new web-based **SA-SAMS follows standard systems development procedures**.
3. Improve the focus of **capacity building** aimed at strengthening data utilisation.
4. Institutionalise **data use assessments** when people are recruited into certain posts.
5. Bring about a **more informed 'Matric results' discourse** that focuses adequately on readiness for post-school studies and dropping out before Grade 12. ★
6. Build the knowledge and skills base needed for the **design and use of large-scale assessments**.
7. Institutionalise better **regular human resources monitoring reports**, covering both personnel numbers and spending, using Persal payroll data and other data. ★
8. In bringing about more efficient **post provisioning**, learn from systems and practices in Western Cape.
9. Make better use of the **performance management data of schools-based educators**.
10. Make better use of **human resources data collected outside the payroll system**.
11. Fix the system of learner-level records, **LURITS**, partly by raising the stakes through a focus on the **monitoring of dropping out**.
12. Institutionalise better measurement of **school-level socio-economic status**.
13. Institutionalise **better archiving of knowledge** produced. *In line with this recommendation, is strongly recommended that the reports emerging from the current project be made public through the website of National Treasury, the initiator of the project.*
14. Engage with **DPME** and others on improving the **rules and guidelines for reporting on sector progress**.

## 1 Introduction

This summary report draws from a number of other reports emerging from a project formally titled ‘*Assessment of education department data use in provinces and the formulation of recommendations aimed at improving systems and service delivery outcomes*’. This project examines the use of data in two South African provinces, **KwaZulu-Natal** and **Western Cape**, to strengthen service delivery in schools. The scope of the project can be described as ‘data generation and use’, where ‘data’ means databases, and not, for instance, digital materials used in the classroom for teaching and learning. This report and the reports that underpin it are aimed largely at officials in Treasury, both national and provincial, the national Department of Basic Education (DBE) and the nine provincial education departments. Thus the two provinces are used as case studies from which a wide range of stakeholders can learn, the aim being to arrive at specific solutions which can accelerate the move to quality service delivery driven to a greater degree by effective data use.

The scope of the project is broad. Partly in order to demonstrate the kind of work that needs strengthening in a variety of areas, and partly to respond to specific needs in the sector as identified by the DBE, it was agreed that more in-depth work would occur in one area, namely the use of **Grade 12 examinations data**.

The other reports emerging from the project are the following:

*Towards better generation and use of data within the basic education sector: Literature review and interview tool* [63 pages, dated 28 February 2017]

*Generation and use of data in the Western Cape in the delivery of basic education* [48 pages, dated 28 February 2017]

*Generation and use of data in KwaZulu-Natal in the delivery of basic education* [52 pages, dated 28 February 2017]

*Optimal school-level Grade 12 performance indicators and a proposed school report card* [42 pages, dated 28 February 2017]

The package of products emerging from the project includes, apart from the above key reports, a couple of slide presentations made, a few Excel files demonstrating particular analyses, a Stata .do file with programming code used to analyse Grade 12 examinations data, and a folder with all source documents not available on the internet<sup>1</sup>. This latter folder contains 51 computer files.

## 2 The activities of the project

The project was conducted by two experts, **Martin Gustafsson** and **Nick Taylor**, who between them spent around 130 days on the project. Martin Gustafsson was the lead researcher.

The project began with a **review of documents and data** of relevance to the project, from South Africa and beyond. This work led to the formulation of a generic ten-page interview questionnaire intended to guide the various interviews to be held.

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<sup>1</sup> At the time of the completion of the current report, the package of products was available in a Dropbox web space at <https://www.dropbox.com/sh/w9rpcfdoes5v10e/AADOPU-QLZKxIuNrBJ7gSZwWa?dl=0> (logging in to Dropbox is not required for this link). The folder of source documents was not included in this upload, however, due to the sensitivity of certain documents, in particular reports from Western Cape’s systemic tests programme. This folder has been made available to project stakeholders through other means.

The desktop work was followed by a series of **interviews with officials in Western Cape and KwaZulu-Natal**, with interviews being conducted over three days in each of the education department head offices of the two provinces. Around thirty people were interviewed, mostly in small interviews consisting of one or two interviewees at a time. Both experts were present in all these interviews. Interviewees were told that their identities would not be revealed in the reports of the project, in order to promote the willingness of interviewees to be frank.

In addition to the head office interviews, Nick Taylor **visited district offices and schools** to gather further information and to verify findings obtained from head office officials. Six and seven schools in Western Cape and KwaZulu-Natal were visited respectively. These schools were a mix of primary and secondary schools.

Apart from discussions with provincial education people, discussions focussing specifically on the project were held with relevant people from DBE, the Auditor-General's office, National Treasury, Department of Planning, Monitoring and Evaluation, KwaZulu-Natal Treasury, and private sector partners involved in education projects.

The interview findings, plus documents and data collected from interviewees, were used to compile **separate reports for Western Cape and KwaZulu-Natal**. Though there are two separate reports, there is synergy between them in the sense that the second report makes comparisons by referring back to the first (the Western Cape report was produced first).

In a separate process, Grade 12 examinations data obtained from the Department of Basic Education in Pretoria were analysed with a view to exploring risks and opportunities associated with a process, currently under way in the DBE, to come up with **more effective measures of success in the Grade 12 examinations**, relative to indicators which have been used for many years and are in many respects problematic. The Grade 12 examinations data analysis led to a proposed school report card.

**Findings and recommendations** were ready to be presented by November 2016. These were discussed, with the aim of firming them up, at meetings with Pretoria-based stakeholders (24 November 2016), DBE senior managers (20 January 2017), Western Cape managers (10 February 2017) and KwaZulu-Natal officials (22 February 2017). Moreover Martin Gustafsson presented some of the project findings to KwaZulu-Natal managers (25 November 2016), the occasion being a presentation including a broader range of issues falling outside the scope of the project.

### **3 Key findings**

What new knowledge did the project bring to the fore? In what respects did the project confirm or firm up existing understandings around how data are generated and used for basic education service delivery in South Africa?

The following five bullets sum up findings from the global literature, findings which are of relevance to South Africa, but also many other countries.

- **The human element is a vital ingredient of good information systems.** On one thing the global literature is very clear: Information systems fixes cannot only focus on technical matters such as the design of databases and web-based portals. The culture of an organisation, which is to a fairly large degree shaped by the organisation's leadership, and the incentives (in the broad sense of this term) which drive human behaviour, are vital ingredients for successful information systems. If there is not enough communication and unity of purpose horizontally (across 'silos' of the organisation) and vertically (for instance between more technical staff and senior managers), it becomes difficult to

develop and improve upon information systems. For instance, where the organisation's priorities are not clear, systems may compete with each other for attention and resources in such a way that projects remain uncompleted and 'hanging' for years. If staff are not unified around a core mission, they may adopt a 'malicious compliance' attitude to systems whose purpose is not clear to them. Thus problems in the rules and systems are not given due attention and are allowed to 'fester'. Staff do not feel compelled to use data creatively to fill important knowledge gaps. The importance of the human element emerged clearly during the analysis of the two South African provinces. Western Cape seems to have been rather successful at achieving unity of purpose, and a focus on learning outcomes, amongst head office officials, and this appears to contribute towards effective collection and use of data. Obviously technical matters are important too. In KwaZulu-Natal very basic technical problems around the stability of e-mail, data servers and networks discourage staff and undermine their productivity.

- **'White elephant' systems are a universal problem.** It has been estimated that only around 15% of information systems set up by governments in developing countries are successful. Up to a third can be considered a total failure. This is often because the human element has not been properly taken into account at the design stage. If human capacity is not built, then new information systems may generate data which are never properly analysed or used for management purposes. If political buy-in is not obtained, then it may be difficult to make the shift from more traditional decision-making that is based purely on the 'hunches' of prominent individuals to decision-making that uses data to a greater extent. In South Africa, it could be argued that the migration from survey-based collection of enrolment aggregates to a national database of individual learners (LURITS) has been less successful than it should have been because human capacity to use the new data have been lacking.
- **Being clear on the desired degree and nature of school principal agency is vital for developing the right systems.** This is a point that is often not well understood. A school system that emphasises progress driven to a large extent by school actors must prioritise strong monitoring systems, including systems that monitor the performance of schools. On the other hand, a school system that is more traditional and centralised can pay less attention to monitoring, but must pay more attention to systems of control and supply chain management. The existing evidence points to the first model, of greater decentralisation, being better for educational progress. However, the literature also emphasises that decentralisation without proper monitoring systems is not a good thing.
- **Three related technical issues must be tackled properly when gauging the educational progress of schools (or education systems): (1) Selection effects, (2) socio-economic status, and (3) the equivalence of tests.** There is now a wealth of good examples from around the world to follow when tackling these challenges. Western Cape has come relatively far in gauging school performance, in particular through its pioneering work on its systemic tests programme at the primary level. However, even this programme needs to evolve through the introduction of better techniques to deal with (2) and (3). With respect to selection effects, the whole South African schooling system needs to deal better with the effect of dropping out and subject selection on Grade 12 performance indicators. Current Grade 12 measures used, for instance, in determining which provinces, districts and schools perform best are flawed, and can lead to poor decision-making.
- **School report cards have become popular around the world for good reasons.** Many countries now have systems whereby the central authorities produce standardised school report cards, using data collected on, amongst other things, learner performance and the socio-economic backgrounds of learners. Such tools are vital if schools are to be held accountable in effective and fair ways. Without them, it is not possible for the state to

identify schools which are clearly mismanaged, or exemplary schools from which others can learn. Without good information systems the state can still attempt to do this, but very high risks exist that the wrong schools will be identified and that schools will lose faith in the authorities. A debatable point is how publicly available school reports cards should be. Should they be uploaded on the Web for everyone to see, or should they be distributed to relevant school managers only? Different countries follow different approaches here, and there are strong arguments both for and against high levels of public exposure. But what seems beyond doubt, is that school report cards do add value. South Africa lags behind other countries in this regard. Apart from Western Cape's school report cards drawing from the systemic tests programme, and national lists with basic pass statistics per school, there is little available, and what is available suffers from a number of methodological flaws.

The next seven bullets refer to findings apart from the ones listed above. The findings that follow, which are more specific to South Africa, emerged from interviews with South Africans and from the South African data and documentation.

- **Uncertainty around school principal powers can complicate the design and implementation of information systems.** The type of decentralisation being pursued in the South African schooling system, and what powers schools, and in particular school principals, enjoy (keeping in mind that practices may deviate from policies), is not as clear as it should be. In some ways, different players in the system seem to be pulling in different directions. For instance, whilst the National Development Plan advocates high levels of school principal agency (which would be line with what the global literature recommends), Auditor-General reports advocate investing in information systems which would be compatible with a highly centralised school system oriented towards command-and-control management. Data on what powers school principals actually wield, and their degree of satisfaction with existing arrangements, is often non-existent (an important exception being the Western Cape's 'customer satisfaction survey', which collects school principal opinions). These uncertainties make it difficult to plan information systems properly.
- **Many existing systems suffer from a lack of relevant documentation, including policy on the system's strategic function.** It is striking how weak the policy basis for a number of costly systems such as LURITS, SA-SAMS and ANA<sup>2</sup> has been. Many have criticised this, and the lack of a clear sense of purpose around these (and other) systems makes it difficult to prioritise systems development activities and to gauge each system's progress. In particular, the link between each system's operations and how it contributes to efficiency and service delivery is not clear enough. This problem is in part what led to the suspension of ANA, a potentially vital system for monitoring primary schools, in 2015.
- **Even taking advantage of the power of the internet in a 'piecemeal' fashion is better than not using this power at all.** The way Western Cape has harnessed the power of the internet is interesting. It has developed relatively low-cost facilities to enable, for instance, data flows between the Department and schools, in response to specific needs as they arose. The systems design has occurred largely within the provincial government, with little outsourcing. This has resulted in Web interfaces and background data processing which, whilst not ideal, have served needs rather well. The approach is interesting because it avoids the common strategy of planning for a large, costly and comprehensive system from the start, and then outsourcing this to an established private developer. Whilst this common strategy is likely to result in a more professional product,

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<sup>2</sup> Learner Unit Record Information Tracking System, South African School Administration and Management System, Annual National Assessments.

a greater range of functions and more user-friendliness, it might also be viewed as prohibitively costly. Of course the Western Cape does require the presence of good developers of Web-based systems within government, something which other provinces may not be able to replicate easily. Yet the Western Cape example does suggest that other provinces and, in particular, the DBE have missed opportunities to migrate certain data transfer functions away from physical transfer devices (such as flash drives) and to the internet. For example, with a relatively minor improvement in the systems development capacity in the DBE, it seems it would have been possible to automate, via the Web, data transfers from the school to the administration within LURITS.

- **Strong organisational centres are important.** The case of Western Cape moreover seems to underline the importance of a strong centre in the organisation. Officials at the provincial education head office seem to have a clear idea of what districts and schools should be doing and give the impression that they themselves are able to do what they ask others to do, meaning that they can provide leadership to layers below the province layer. The same sense of a strong organisational centre did not seem present in KwaZulu-Natal, for a variety of reasons discussed in the project's documentation. There is perhaps too much faith within this province in the ability of districts to solve problems on their own, without guidance and leadership emanating from the head office.
- **Much activity around data generation and use is oriented to 'blind compliance' as opposed to smart compliance aimed at adding value to service delivery.** In the schooling system as a whole, much effort goes into complying with requests for data generation and submission, although often these data are not quality assured or even used anywhere for any practical purpose. This phenomenon is common in public systems around the world. A 2013 report by the Dell Foundation, focussing on South Africa's education districts, provides a useful account of this problem. In an ideal situation, this would not happen because everyone would be focussing on key service delivery outcomes, would question reporting processes that did not seem to lead anywhere, and would insist that if data are submitted somewhere, useful information products that use the submitted data should be coming back.
- **Auditing of the quality of data has occurred, but has been weak and infrequent.** Use of existing data to advance good planning and management in the schooling system, for instance through the production of analytical reports and more information tools such as school report cards is widely seen as being weak. What is less acknowledged, because this occurs largely in the background, is that audits of the quality of data occur too infrequently, and that when they occur, they are often flawed. This is a serious gap as many information systems are still maturing and therefore often produce imperfect data. For instance, unique identifiers of schools and learners change across systems and over time when they should not. Assessment results are often less comparable over time than is commonly believed. Without data quality audits, it is not possible to gauge whether systems are improving and there is a greater risk that data will be used for purposes for which they are not suitable. Moreover, in the absence of these audits, it becomes easier for people to say 'the data has problems, therefore it cannot be used'. Very few data are perfect. Audits help to establish how imperfect the data are, and what purposes it can be used for.
- **The importance of analysing raw 'microdata' is often not appreciated.** Many in the education departments who say they are conducting 'data analysis' are in fact not doing this in the strict sense. They are often analysing aggregated data, for instance school-level aggregates of Grade 12 examinations data or employee-level aggregates of spending, obtained through data querying systems. They are not analysing the data at the lowest possible and 'raw' level. Analysing aggregated data can be useful, but if no-one in the organisation is analysing the 'raw' data, that seriously limits the organisation's capacity to

do proper analysis. For instance, it becomes more difficult to examine distributions, correlations and other relationships, and gaps in the data.

- **Knowledge management systems are weak.** The current project has confirmed that knowledge management systems in the education departments are weak. Reports and analyses are easily lost after some years as there is no institutional system to archive them for retrieval at a later point in time. Retrieval of knowledge produced in the past currently depends too much on the accessibility of individuals.

#### 4 Recommendations

The recommendations which follow are broken down according to who is likely to be a key driver of the change. There are fourteen recommendations, but no more than four recommendations are assigned to any responsible party. But this still leaves the question of which responsibilities appear to be especially important for the sector as a whole, for instance in terms of the agenda of the Minister of Basic Education. It could be argued that two recommendations stand out for their strategic importance and the concreteness of what is proposed. The two are the following:

- **Recommendation 5 on better national and school-level use of ‘Matric’ data.** Both a regular national report with in-depth analysis of each year’s Grade 12 results, and their meaning for educational progress, and school-level report cards drawing from Grade 12 data seem important. The argument is often raised that the system often pays too much attention to Grade 12, relative to, say, primary schools. This is in many respects true. However, Grade 12 has good data, and a policy discourse built up over the years, yet this policy discourse is flawed in many ways. Fixing these flaws, and institutionalising nationally designed school report cards would strengthen the system’s capacity in a number of areas, putting the system in a better position to implement similar (though not identical) methods at the primary level, when good national assessment data at that level become a reality.
- **Recommendation 7 on better monitoring of personnel trends (financial and non-financial).** Given that personnel trends are weakly monitored currently, with analyses often being reactive when they should be proactive, given that personnel account for around 85% of the sector’s spending, and given that monitoring these trends can be highly complex, a much stronger role for the national Department of Basic Education in this area is likely to greatly enhance planning in the sector.

The fourteen recommendations follow.

The first recommendation would be driven by **political leaders and senior managers of the education departments** (DBE and nine provincial departments).

1. **Strengthen the understanding of key education data concepts amongst leaders and senior managers.** Whilst political leaders and senior managers do not need to be specialists in the areas of education data and information, they make important decisions in this complex area and need access to easy-to-follow guidance in areas such as risks typically associated with large information systems projects, best practices in the measurement of educational progress, and the obstacles typically faced by countries attempting to improve school connectivity. A short guide should be produced and used, and updated as the need arises. *This recommendation can be implemented immediately.*

The following should be driven by the sections in the education departments responsible for the design, development and overall operation of SA-SAMS<sup>3</sup>:

- 2. Ensure that the development of the new web-based SA-SAMS follows standard systems development procedures.** The DBE has committed itself to a far more effective SA-SAMS designed to overcome many of the problems with the existing system. Above all, the use of web-based data transfer will allow for a far speedier and secure merging of data across schools, and communication to schools of data problems which they should fix. The findings of the project emphasise the dangers inherent in poorly planned information systems projects, and the associated risk of fruitless expenditure. Avoiding the risks should be relatively straightforward if standards established in the industry over the years are adhered to. Experienced systems developers should guide the development of the new SA-SAMS. Feedback from SA-SAMS users, in particular school-level users, at regular intervals, is necessary to ensure that the system is fulfilling its functions and, importantly, adds value to the school. It must be very clear why data are generated: they must be used for specific monitoring and management purposes. An important 2016 evaluation of SA-SAMS, which points to key problems in the development trajectory of SA-SAMS in past years, should be studied closely by those taking the system forward. *SA-SAMS is a sufficiently large project to justify a regular newsletter updating users about recent developments, reassuring users that their concerns are being taken into account, and explaining what can be expected in the future. Insisting on such a newsletter would help to achieve the level of transparency and accountability needed for this type of project. The first newsletter should appear on the SA-SAMS website in 2017.*

The following should ideally be driven by the human resources sections of the education departments, specifically those focusing on office-based staff.

- 3. Improve the focus of capacity building aimed at strengthening data utilisation.** There is a perception that much of the capacity building occurring currently to improve data utilisation in the education departments is generic and poorly focussed. Whilst generic training in, for instance, Excel can add value, what is also needed is training focussed on solving problems typically faced by managers and planners in the departments. The reports of the current project include references to specific data analysis problems which analysts have, up till now, not been particularly good at resolving. One skill that is emphasised is the ability to use, for certain purposes, data which are in some respect 'imperfect' insofar as they are incomplete or have errors. This skill is important as much data are imperfect, but can nevertheless be put to a number of uses, in particular in the area of monitoring. Such use can help to highlight where the gaps in the data are, and what gaps can most cost-effectively be fixed. *Work on this recommendation is to some degree already occurring. It should be given a boost, after which improvements over several years should be expected.*
- 4. Institutionalise data use assessments when people are recruited into certain posts.** There is considerable interest in using assessments that test a job applicant's skills in specific data-related skills when recruitment into jobs requiring these skills occurs. Such assessments are produced from time to time, but on a fairly ad hoc basis. The DBE should produce official versions of a few such assessments and share these with provincial departments. Certain assessments should be publicly available (for instance through the DBE's website) so that applicants can prepare themselves, whilst other assessments should be accessible to only a few trusted people, and used in conjunction with the job interview process. *The DBE should aim to have the assessments ready within a couple of years. Thereafter, their use should be increasingly institutionalised.*

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<sup>3</sup> South African School Administration and Management System.

The following should be driven by the examinations sections of the education departments (but in particular of the DBE).

5. **Bring about a more informed ‘Matric results’ discourse that focuses adequately on readiness for post-school studies and dropping out before Grade 12.** Despite several attempts in the past to combat the centrality of the ‘Matric pass rate’ as a measure of the quality of schooling, this statistic remains a key preoccupation amongst many planners, district officials, school principals, journalists and even researchers. Focussing just on this statistic creates a number of problems. Schools may be encouraged to restrict entry into Grade 12 to boost their pass rate. Improvements in the pass rate can be brought about by improvements just at the bottom end of the performance spectrum, without substantial improvements at higher levels, for instance at levels that universities would be interested in. The project has included substantial data analysis aimed at producing a range of useful indicators of Grade 12 performance which could contribute towards a more informed debate. There are a number of complexities relating to, above all, the question of how to determine the number of learners who would have reached Grade 12 if there had been no dropping out. A key element of this recommendation is the publication, on an annual basis, by the DBE, of a **Grade 12 results report that would go beyond the ‘first cut’ information released in the existing reports released each year** by the DBE immediately after the year-end examinations. The proposed report would provide a more holistic picture of National Senior Certificate (NSC) achievement by including the results of part-time learners, supplementary examinations and the results of the Independent Examinations Board (IEB). It would also pay attention to the question of dropping out before the examination, shifts in subject combinations which could impact on university-readiness, and the attainment of subject-specific mark thresholds used by universities for the purposes of admitting students. The DBE is interested in the report being proposed, but is somewhat limited in terms of its capacity to take this type of work forward.

The project has also produced a proposed **Grade 12 school-level report card**, designed to inform schools of their relative performance and rate of progress, using a variety of indicators. It is recommended that this work form a basis for further work, and consultation, aimed at having an official Grade 12 report card. This would be in line with developments in other countries aimed at a better use of information in the school improvement discourse. A Grade 12 report card would moreover provide a useful precedent for similar tools at lower grades, linked to the Annual National Assessments (ANA), or its successor programme. One possibility would be to pilot the report card within the Dell Foundation’s Data Driven Districts (DDD) project, which has expressed a willingness to do this piloting.

*A first version of the new Grade 12 results report could be made public in 2017 or 2018. Work on taking the Grade 12 school-level report card forward could begin in 2017, though it could take some years of testing and adaptation before it becomes an integral part of the school improvement debates at a local level.*

The following should be driven by the assessments sections in the education departments.

6. **Build the knowledge and skills base needed for the design and use of large-scale assessments.** The design of the assessment systems that will succeed the Annual National Assessments (ANA), after the latter were stopped in 2015, is ongoing and systems change is likely to continue for several years as the sector learns from its experiences. Though ANA is a source of vital data for the schooling sector, these data were not the subject of in-depth analysis in the project as the future of the programme was not clear. However, the project’s evaluation of Western Cape’s systemic tests revealed a number of important points. In particular, it revealed that there needs to be ongoing learning in the area of large-scale assessments which generate data for monitoring purposes. Measuring the

competencies of children, comparing trends over time, understanding what the data mean for interventions and communicating performance statistics in a clear and fair manner are highly complex challenges which countries around the world are grappling with. What we know now is definitely better than what we knew ten years ago. The Western Cape system should have been less static and the current project's recommendations point to specific changes that should be explored in the coming years. A key element must be a few strategic structures, each with specific roles, which help to take forward our knowledge about assessments. Some structures need to be more technical, others less so. Not only assessment experts should be involved in the process, though these experts have a key role to play. However, given the sensitivity and importance of assessments, a wide range of stakeholders need to understand what the task entails. *During 2017 the DBE should lead a process to establish (or strengthen) the required structures, perhaps building on experiences in 2016 in setting up 'assessment dialogues'. This process should focus in part on critically understanding the experiences of Western Cape, given that this province has been particularly ambitious and successful in taking a large-scale provincial assessment system forward.*

The following should be driven by the sections of the education departments (but in particular of the DBE) responsible for post provisioning and other human resources management functions.

7. **Institutionalise better regular human resources monitoring reports, covering both personnel numbers and spending, using Persal payroll data and other data.** Monitoring the human resources of the schooling system, and interpreting the meaning of the trends, is an immensely important and complex area. Public employees in the schooling sector account for around 3% of South Africa's gross domestic product (GDP). This should underscore the importance of careful monitoring, including the monitoring of future costs as the demographics of the workforce changes. The project has confirmed that this type of monitoring is weak. Too little of it happens, it tends to be reactive when it should be more pro-active, and methodologies in relation to, for instance, unit costs and attrition rates, are sometimes faulty. Given the complexity of the work, the DBE has a key role to play in providing leadership, through its own experts and by facilitating learning across provinces. The DBE in fact already produces, internally, a relatively good periodic report which draws from various data sources and provides a discussion of the implications of trends for strategy. This report provides a good point of departure for strengthening monitoring in the area of human resources. However, this report would benefit from more peer-reviewing, the inclusion of a focus on expenditure and unit costs, and analysis of movements of staff across schools. *From 2017 the DBE's report should be strengthened and take on a wider focus that includes, for instance, trends in the unit cost of employees. The methods used for the production of the report should form the basis of a new and well-structured training programme directed at provincial planners. In part, such a programme, which should become fully operational in 2018, should be aimed at promoting learning between analysts in various organisations, including the provincial departments, DBE, National Treasury, and the Department of Public Service and Administration.*
8. **In bringing about more efficient post provisioning, learn from systems and practices in Western Cape.** Determining each year how many posts, of different categories, schools should be entitled to, has arguably been fraught with problems in all provinces with the exception of Western Cape and Gauteng. Western Cape seems successful partly because it has a web-based system which calculates post entitlements, communicates this to schools and, importantly, allows for schools to lodge complaints or request adjustments. Systematising the exceptions work is important as it would otherwise be highly subject to unfairness, excessive levels of discretion and even nepotism and corruption. One key advantage with the Western Cape system is that, unlike the Microsoft

Access-based tool developed some years back by the DBE to implement post provisioning, it produces a number of management reports with vital statistics. Put differently, the Western Cape system is not a 'black box', something some provinces have argued is the case with the DBE's tool. A number of caveats should be noted. Firstly, Western Cape has been relatively successful in its post provisioning processes partly because it has capable and committed officials who oversee the work and produce some scenarios 'manually' not produced automatically by their system. Secondly, there seems to be no political or union interference in the process in Western Cape. In some other provinces, unaffordable post entitlements have come about partly because of undue political pressure. Essentially a degree of 'gaming' between the provincial education department and the provincial treasury has occurred. Thirdly, resolving the core post establishment processes, which is the focus on this recommendation, will not resolve a variety of related problems often placed under the 'post provisioning' banner. For instance, mismatches between the number of physical classrooms in a school and posts given is a further resourcing problem whose fixing would involve changes within existing policies. *The first step in implementing this recommendation would be to investigate whether simply procuring (or obtaining, at no cost) the Western Cape system as is would be optimal, or whether it would be best to replicate it, using its basic design and programming code as a point of departure. This initial step should be taken in 2017.*

9. **Make better use of the performance management data of schools-based educators.** Data collected within the Integrated Quality Management System (IQMS) seem not to be used for much. It does inform which educators are within the approximately 0.5% of educators who should not receive their annual notch increment due to their performance being 'unacceptable'. But information on whether an educator is 'good' or 'outstanding', as opposed to 'meets minimum standards', seems to receive little attention outside conversations happening within schools. These conversations are of course important, but the data suggest that they happen in some schools but not others. Specifically, in the just under half of schools where everyone receives the same IQMS rating it seems unlikely that there is any meaningful conversation and the IQMS is probably little more than a compliance exercise. The fact that most schools are clearly using the IQMS in meaningful ways, in the sense that there is within-school differentiation, suggests that the minority of schools which do not should be identified and be persuaded to use IQMS as it should be used. Moreover, it seems extremely important to gauge to what extent educators with higher IQMS ratings are being appointed into promotion posts. Lastly, analysis of the relationship between IQMS scores and the performance of schools in, for instance, the Grade 12 examinations is needed to monitor whether schools' IQMS ratings are realistic and at least roughly comparable. The DBE has made publicly available one comprehensive IQMS report, namely the report covering the 2011/12 financial year. Reports of this nature should be produced more frequently and they should be used to inform and adjust IQMS processes. But they should include analyses of the kind proposed here. *The DBE should return to releasing periodic IQMS reports, starting in 2017.*
10. **Make better use of human resources data collected outside the payroll system.** Historically, the teacher questionnaire of the Annual Survey of Schools (ASS) has collected important information on teachers not available anywhere else. Moreover, details relating to approximately 25,000 educators working in public schools but employed by the school governing body (SGB) are found in this data source and nowhere else. The ASS is increasingly being replaced by data submission through SA-SAMS, but the data fields remain basically the same. The nine provincial departments and the DBE should use these data to answer questions which are often asked relating to, for instance, the degree to which schools focus on getting teachers to teach specific grades, as opposed to the degree to which they get teachers to teach specific subjects. *Use of these data by the education departments to answer important policy and operational questions should begin in 2017.*

The following should be driven by the EMIS<sup>4</sup> sections of the education departments (but in particular of the DBE).

- 11. Fix the system of learner-level records, LURITS, partly by raising the stakes through a focus on the monitoring of dropping out.** Even in a relatively effective province such as Western Cape, there seem to be fairly serious problems with the maintenance of unique learner identifiers in LURITS, meaning the system is not able to fulfil what ought to be one of its core functions, namely to monitor whether children of compulsory school-going age remain in the system. The problem is partly that the monitoring of dropping out, using LURITS, has received little attention, and optimal methods for this work have yet to be identified. The provincial education departments, with technical guidance from the DBE, should begin using LURITS data to identify dropping out ‘hot spots’ in order to guide actions aimed at ensuring that schools do not lose learners, in particular learners before the age of fifteen. *This work should begin in 2017, and by 2018 districts should have access to materials, such as maps, indicating where dropping out is concentrated.*

The DBE should drive the following (it is unclear which section in the DBE).

- 12. Institutionalise better measurement of school-level socio-economic status.** Because school results are so sensitive to the home backgrounds of learners, and because it is important to compare ‘apples to apples’ when judgements are made around which schools are well- or poorly-performing, school-level measures of socio-economic status have come to be seen as an indispensable part of the education service delivery ‘toolbox’ across many countries. The DBE should use Stats SA population census data, and possibly other relevant data sources, to come up with better and more up-to-date measures than the ones which were used to determine the original school quintiles. *This work should ideally begin in 2017, though capacity constraints could delay this to 2018.*

Research or knowledge management sections in the DBE and the provincial departments should focus on the following:

- 13. Institutionalise better archiving of knowledge produced.** The current project has confirmed that many data analyses conducted within and for the basic education sector are lost over time as they are not widely distributed and are not archived systematically within, for instance, the DBE. Not all data analysis that has been produced is of a high standard, but some of it is. Even where the standard is not high, or findings of analyses are not supported by the DBE, it is vital that reports and datasets are properly stored so that they can be easily accessed by new researchers. In a nutshell, proper knowledge management practices need to be entrenched, and a larger number of reports should become publicly available via the Web.

The following should be done by education officials in the provincial departments and, in particular, the national department, who report on sectoral indicators of performance.

- 14. Engage with DPME and others on improving the rules and guidelines for reporting on sector progress.** Whilst the previous recommendations are all limited to changes that can be brought about within the basic education sector, this recommendation deals with change in the general government system. This makes the current recommendation a particularly difficult one to carry through. Yet it is possible and important. The literature review provided a systematic account of how existing reporting guidelines, in many ways captured within just three documents produced at least six years ago, could be tightened up with a view to offering better guidance to line departments (like DBE) on the difficult

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<sup>4</sup> Education Management Information System.

task of monitoring progress through indicators. For instance, templates on how provincial departments should cover, in their annual reports, trends with respect to their personnel could be improved<sup>5</sup>. This is likely to result in a monitoring process that is more geared towards generating knowledge, as opposed to just bits of information. The challenge lies largely in engaging with Department of Planning, Monitoring and Evaluation (DPME) on the basis of carefully formulated requests for changes to the rules, following consultations between provincial and national education officials. However, rules which seem poorly formulated should not prevent improvements despite these rules. To illustrate, Western Cape seems to produce a better overview of its human resources in its (education department) annual report than KwaZulu-Natal, although both provinces have to follow the same rules.

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<sup>5</sup> See the analysis of the KwaZulu-Natal and Western Cape annual reports in the literature review.