What's Wrong with South African Schools?

Nick Taylor

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1. *Introduction*

The very low value for money provided by the South African schooling system has become well known in the 15 years since the fall of apartheid. Unfortunately, how to improve the quality of schooling is far less clear, despite the activities of NGOs and donors, both international and local, directed toward this end for well over two decades, and of government since 1994. The starting assumption of the present paper is that weaknesses at every level of the system – classroom, school and administrative structure – contribute to the crisis in schooling. The purpose of the paper is to identify the key problems which occur at each of these levels, as a prerequisite for designing more effective school improvement interventions.

The evidence on which this analysis is based varies from strong, generalisable data derived from representative national surveys, to small scale descriptive studies based on a handful of classrooms. Much of the data, therefore, despite the ring of authenticity it may have for anyone who has spent time in South African schools and classrooms, requires verification before it can serve as the basis for a firm national picture. Nevertheless, it illustrates the range of considerations which need to go into the design of any reform effort.

2. *Learner performance*

The poor performance of South African schools compared to those in both developed and developing countries has been established at primary level in mathematics and reading (Moloi and Strauss, 2005; Howie et al, 2007) and at secondary level in mathematics and science (Howie, 2001; Reddy, 2006; see also Taylor et al, 2007). The SACMEQ[1] scores for mathematics at Grade 6 level starkly illustrate the point (Table 1) These figures are important for at least two reasons. Most obviously, they show that South Africa is outperformed by 8 surrounding countries, many of which, including Mozambique, Kenya, Uganda and Tanzania, are much poorer, with gross domestic products in the order of one-tenth to one-fifth of South Africa's. This is a demonstration of the lesson that, while in general, poverty is strongly associated with performance, many school systems achieve higher quality with far fewer resources than South Africa has.

A second reason why the patterns shown in Table 1 are important arises from an analysis of the maths scores by quintile. Even amongst the richest 20% of schools (quintile 5), South Africa is outperformed by Mauritius and Kenya, and in all the other quintiles the South African mean scores fall below those of the SACMEQ all-country means. Clearly, a culture of complacency and low expectation permeates the entire South African system, including those schools which were privileged under apartheid and which continue to

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[1] Southern and Eastern African Consortium for Monitoring Education Quality.

enjoy levels of resourcing well in excess of those which pertain in the majority of schools.

Table 1: SACMEQ II scores for Grade 6 math, 2000

QUINTILE	1	2	3	4	5	Mean
Botswana	491	499	510	508	557	**513**
Kenya	540	545	555	565	611	**563**
Lesotho	443	448	448	445	452	**447**
Malawi	422	427	435	433	447	**433**
Mauritius	519	564	587	620	640	**584**
Mozambique	526	525	531	530	538	**530**
Namibia	403	402	411	425	513	**431**
Seychelles	520	541	555	576	579	**544**
South Africa	442	445	454	491	597	**486**
Swaziland	506	511	511	513	541	**517**
Tanzania	484	511	529	528	560	**522**
Uganda	484	497	498	509	543	**506**
Zambia	414	425	436	434	466	**435**
Zanzibar	478	472	478	479	484	**478**
Mean	**468**	**480**	**485**	**492**	**560**	**468**

Source: van der Berg and Louw, 2006a

Table 2 shows the relative performance of South African high schools, indicating that some 80% of schools are highly ineffective, producing only 15% of higher grade (HG) passes in mathematics in the Senior Certificate (SC) examinations, compared with 66% produced by only 7% of the country's top performing schools.

Table 2: Distribution of high schools by performance in Senior Certificate mathematics, 2004

	Formerly privileged*	African	Sub-total	Prop of Total	*Prop of HG math passes*
Top performing**	380	34	414	7%	*66%*
Moderately perf	254	573	827	14%	*19%*
Poor performing	600	4 277	4 877	79%	*15%*
Total	1 234	4 884	6 118		

* Under apartheid these schools were administered by the House of Assembly (for whites), House of Representatives ('Coloured') or House of Delegates (Asian)
** Top performers produce at least 30 maths passes in the SC examination, with at least 20% at the higher grade (HG); moderately performing schools produce at least 30 maths passes, mostly at standard grade (SG), while poorly performing schools fail to achieve 30 passes in maths.
Source: Simkins, 2005

This table also holds two main lessons. First, there are massive disparities in performance between schools within the South African system, to a large extent structured by a history of poverty and deprivation, with African schools overwhelmingly represented in the poor performing category. Indeed, South Africa has the highest levels of between-school

inequality[2] of performance in both mathematics and reading, by a large margin, among SACMEQ countries (van der Berg, 2005). The point is emphasised by disaggregating Grade 6 reading scores in the Western Cape (Table 3), which are assessed in all schools in the province every two years.

Table 3: Western Cape literacy pass rates for Grade 6 by former department, 2003 and 2005

Ex-Dept	Grade 6		% Distribution of Learners by Ex-Dept	
	2003	2005	2003	2005
CED	82.9	86.9	20.1	21.2
DET	3.70	4.70	13.6	14.3
HOR	26.6	35.5	65.8	64.2
Total Province	**35.0**	**42.1**	**100**	**100**

CED: Cape Education Department; DET: Department of Education and Training; HOR: House of Representatives
 Source: WCED Grade 6 Learner Assessment Study, 2003 and 2005

The results powerfully illustrate the scale of the achievement gap. While more than four out of five children in former white schools were reading at the appropriate level, as defined by the national curriculum, the figure, while improving, was less than half in former Coloured schools, and in former DET schools only four children in a hundred were reading at grade level.

However, the second lesson to be drawn from Table 2 discerns a secondary pattern superimposed on the fundamental association between poverty and performance. This is a pattern which refutes a principal conclusion of Coleman's (1966) famous study, that schools cannot make a difference to pupils' lives because of the overriding effects of socio-economic status on school success. Table 2 shows that 14% of African schools are classified as top- or moderately performing, defying their history of discrimination and deprivation. The findings by Christie et al (2007) that pass rates in the SC exam show the full range of variation from 0% to 100% in schools classed in all 5 poverty quintiles, with the exception of quintile 5 where the lowest placed school achieved a rate of 4%, provide a different route to the same conclusion: there is no deterministic relationship between performance and financial resources. This is not to imply that there is no threshold of poverty below which no school can operate effectively, nor that increased levels of resourcing are not generally associated with improved performance; rather, it is to emphasise that most South African schools can do far more with the resources at their disposal than they currently do.

The South African school sector can be characterised as a high cost, high participation, low quality system (Taylor et al, 2007). What are the factors which result in such poor performance relative to other countries and in such massive disparities within-country? Both the poor comparative performance and the within-country inequities are, of course, traceable back to a history of 350 years of colonial selective development, exacerbated by the policies of systematic discrimination and isolation pursued between 1948 and 1994.

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[2] As measured by the intraclass correlation coefficient rho (ρ), which expresses the variance in performance between schools as a proportion of overall variance.

The last 15 years have demonstrated just how difficult and slow it is to transform the school system, despite very thoroughgoing structural change. We pursue the argument below that the key to improved performance lies in fostering a culture of professional responsibility at all levels of the system, and that this task involves both a cultural sea change, and a technical dimension which would combine the use of focused accountability systems and professional development programmes. But first we examine the contributing causes of poor performance in the domains of school leadership and management and teachers and teaching.

3. *School leadership and management*

As international attention in the last decade and more has focused on calls for schools to improve performance in general, and to increase the equity of student achievement in particular, so the debate around the role of school leaders in improving performance has intensified. New conceptions of leadership have been defined, and new polarities set up, as researchers strive to find the most appropriate combination of leadership qualities and activities to respond to heightened public expectations of schools. Thus, the notion of the principal as a charismatic individual who exercises authority in a hierarchical manner is counterposed to the concept of distributed leadership, where functions are shared by school managers and teachers; the term instructional leadership gives priority to the role of the principals in directing schools towards effective teaching and learning, while the concept of transformational leadership emphasises the function of leaders as agents of social change.

The loosely defined nature of many of these terms (Prestine and Nelson, 2005) and the paucity of empirical evidence supporting claims made on their behalf (Leithwood et al, 2004) have moved more than one commentator to adopt a rather jaundiced view of the leadership literature. For example, Levin notes the existence of a serious problem regarding the knowledge base on educational leadership: "There are many viewpoints in the field and very little solid research supporting them. Much of what parades as research is opinion garbed in the language of research." (2006, 43). According to Levin: "(t)wo of the challenges to leadership research … were the complexity of the leadership phenomenon and the degree to which values and goals of authors, rather than the research evidence itself, dominate findings and recommendations." (2006, 41).

Nevertheless, the importance of leadership to the success of schools is undeniable. In their evaluation of England's National Literacy and Numeracy Strategy (NLS and NNS), which they judge to be one of the most ambitious and successful examples of large-scale school reform in the world to date, Leithwood et al (2004) conclude that the nature and quality of leadership was a key reason for its success. Based on a large survey of English schools and case studies in 10 of these, the authors add a layer of complexity to some of the easy dichotomies frequently heralded in the literature: they conclude that transformational leadership can play an important role in school improvement, that such leadership may be widely distributed throughout the school, but that hierarchical and distributed forms of leadership both have important roles to play. Distributed leadership

assumes a division of labour within the schooling system and allocates functions according to where and by whom they are best performed: the challenge for leadership in any complex system is communication and the coordination of the component parts. According to Leithwood et al (2004), school principals perform three broad kinds of leadership functions in implementing the NLS and NSS: setting direction (and in particular fostering high expectations), redesigning the organisation, and developing people. While leadership effects on student learning account for less of the variance than teacher effects, leadership creates the conditions under which teachers can work effectively: in other words, a school environment conducive to teaching and learning is a prerequisite for good school performance. In the words of Elmore and Fuhrman (2001), this entails fostering among teachers within a school a shared set of values and understandings about such matters as what they expect of students academically, what constitutes good instructional practice, who is responsible for student learning, and how individual students and teachers account for their work and learning.

In their study of disadvantaged South African schools that perform well, Christie and her colleagues (2007) found a wide variety of leadership styles associated with success. But what is it that successful leaders do to improve teaching and learning in their schools? What practical advice can research provide to principals striving to improve performance? Two issues have emerged in the South African literature: time management, and curriculum leadership.

3.1 Time management and institutional culture

An analysis of data collected from principals and teachers during the SACMEQ study revealed high levels of teacher absenteeism and latecoming, as reported by principals. This problem is particularly widespread in the 4 poorest quintiles of the system, where 97-100% of principals reported it as a problem, but a substantial proportion of schools in the most affluent quintile (26 per cent) also report experiencing the same problem. A regression analysis reveals that the negative effect associated with teacher absenteeism is large (around 82 test point scores on a sample mean of 500) and highly statistically significant (van der Berg and Louw, 2006b). Gustafsson (2005) has calculated that if this problem were eliminated then SACMEQ scores would improve by nearly 20% in poor schools and by some 15% across the system; multivariate regressions for the other SACMEQ countries revealed that for close to half of the countries this is not a significant explanatory variable; moreover, the significance of the variable in the case of South Africa is substantially higher than for any other country. Gustafsson speculates that because the problem is widespread across both rural and non-rural schools, it is probably not attributable to transport problems and long distances.

These conclusions are supported by one of the findings of the PPP[3] study: one management level indicator which stands out is whether or not the school keeps an attendance register for teachers. Most schools in the PPP sample have a written timetable, but it is noteworthy that in a subsample of poor but effective schools principals are more

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[3] The Pupil Progress Project (PPP) was a school effectiveness cross sectional study undertaken on 2003 in a 90 primary school stratified random sample in the Western Cape.

likely to keep track of the implementation of the timetable by means of a master copy, when compared with the sample mean. Two other time related indicators worth noting are that in only around half of PPP schools do children return promptly after break, and that in fewer than three-quarters does school start on time in the morning.

When asked about the problem of absenteeism and latecoming among teachers, most principals tend to shrug and write off the practice to the unreliability of public transport, a lack of teacher commitment, or union militancy, and it is right here that the root problem in South African schools is discernable. The failure on the part of these principals to exert a tight time-management regime in their schools is symptomatic of a general failure to take responsibility and to exercise control over their own work environment. It would seem that South African teachers, managers and officials have not transcended the dependency culture fostered by successive authoritarian regimes over the last three centuries. Elmore (2004) notes that a culture of passivity and failure is present in schools where managers, teachers and pupils assign causality for success or failure to forces outside their control. In contrast, in two separate surveys commissioned by the Department of Education into the characteristics of poor high schools which perform well in the Senior Certificate exams (Malcolm et al, 2000; Christie et al, 2007), it was found that a sense of responsibility and shared enterprise, a culture of hard work, and high value attached to good performance were strongly evident throughout these institutions: principals were focused, teachers dedicated and pupils motivated. In the 18 successful schools studied by Christie et al, none were found to have significant degrees of latecoming or absenteeism among either teachers or learners.

In the face of poor teacher attendance, it would seem that learner absenteeism is not a major problem in South African schools (CASE/JET, 2007). This is a very positive feature of what is otherwise a poorly functioning system. Unfortunately, although potential learners keep showing up at school, it has become obvious that the majority of schools are highly ineffective in fulfilling the promise presented by the country's children.

Another area of time management over which principals have a great deal of control is in timetabling. Figures from the PIRLS study[4] indicate that South African schools spend significantly less time on reading, the foundation for all other learning, than the majority of other countries who participated. As shown in Table 4, while nearly three quarters of South African schools spend less than 3 hours a week on reading, well under half of the participating schools in other countries do so; significantly lower proportions of South African schools are also found in the categories of schools who spend more than 6 hours a week or between 3 and 6 hours a week on reading, than the PIRLS mean.

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[4] The Progress in International Reading Study, an investigation into Grade 4 reading performance, was conducted in 40 countries in 2006.

Table 4: Time spent on reading

	>6 h/week	3 - 6 h/week	<3 h/week
International mean	25%	37%	44%
South Africa	10%	18%	72%

Source: Howie et al, (2007)

Furthermore many South African teachers spend less than half their time teaching. This finding was identified by Chisholm et al (2005), who, through a national survey verified by case studies in 10 schools, concluded that:

- Teachers work an average of 41 hours per week, out of an expected minimum of 43
- 41% of this time is spent on teaching, which translates to 3.4 hours a day
- 14% of in-school time is devoted to planning and preparation
- 14% is spent on assessment, evaluation, writing reports and record-keeping

In strong contrast to this lackadaisical picture, the two studies on poor schools that perform well (Malcolm et al, 2000; Christie et al, 2007) found that, without exception, time is a highly valued commodity in successful institutions: not only is punctuality observed during the school day, but additional teaching time is created outside of normal hours. Ensuring the effective use of time in any institution is essentially a leadership responsibility, and it would appear from the available evidence that it is a responsibility which the vast majority of South African principals abdicate.

There is also a policy dimension to the problem of time management: the study by Chisholm and her colleagues indicates that much time is spent by teachers during school hours completing forms which appear to serve little purpose other than bureaucratic compliance, such as formalistic planning documents, and extensive assessment reports on the performance of individual learners, supported by boxes of evidence for the latter. This is a classic example of how some regulations are self-defeating: designed to improve curriculum coverage and assessment, the onerous paperwork serves to distract teachers from the core task of teaching, thus effectively undermining curriculum completion. Such counterproductive forms of regulation recall the observation by Hubbard et al (2006) that one characteristic of a good leader is to protect her staff from bad policy.

The extent to which time is used for teaching and learning is the most valid and obvious indicator of the extent to which the school is dedicated to its central task. It is self evident that no learning can occur if teachers and pupils are not in class at the same time. This is the central intent of Bernstein's (2000) contention that the instructional dimension of schooling is always subordinate to the regulative. But the regulative discourse is about much more than good time keeping: time management is one element of a well functioning institution, in which the work of managers, teachers and learners is organised and coordinated to achieve high levels of learning. According to Bernstein (2000), a strongly regulated institution fosters conscientious and industrious students, and this in turn sets the tone for instruction. The regulative discourse is responsible for the moral order within the school: it socialises learners and provides conditions conducive to learning. The evidence provided above marks the majority of South African schools as

maintaining a very weakly framed regulative order, which not only creates a poor learning environment, but, in doing so, socialises children into lackadaisical work habits and a passive attitude toward their own future.

3.2 Managing curriculum delivery

Elmore (2000; 2003; 2004; Elmore and Fuhrman, 2001) uses the term 'internal accountability systems' to signal the processes through which the school organises effective curriculum delivery. These include: designing school improvement strategies, implementing incentive structures for teachers and support personnel, recruiting and evaluating teachers, brokering professional development consistent with the school's improvement strategy, allocating school resources towards instruction, and buffering non-instructional issues from teachers (Elmore, 2000). Citing Elmore's notion of internal accountability, Christie et al (2007) note that the specific ways in which internal organisation of the curriculum and monitoring of progress is managed in successful schools differed from one to another: in some it was the task of the principal, for others it was Heads of Departments (HODs), and in a few cases, active teachers; however, in all successful schools in their sample there were strong internal accountability systems in place: these schools knew what constituted the work necessary to achieve good results, and they had systems in place to do the work and monitor it.

3.2.1 Planning and monitoring curriculum delivery

The literature, both international and local, is short on detail concerning the activities and instruments which constitute these curriculum delivery systems, providing little practical guidance to school leaders. Locally, the PPP study found a statistically significant association between improved learning and two curriculum management factors: whether maths teachers had their own copy of the National Curriculum Statement (NCS) document, and whether the implementation of curriculum plans of Grade 6 maths and language teachers was monitored by school managers, which is done in only 56% of schools according to principals, although only 41% of teachers agree (Taylor et al, forthcoming).

3.2.2 Provision of books

A third curriculum management factor which shows up in the PPP regression analysis is the presence of book retrieval systems: around half of schools in the Western Cape sample maintain such systems (52% according to principals and 57% according to HODs), but those which do have book retrieval processes perform significantly better than those that don't (Taylor et al, forthcoming). The adequate provision of books and stationery is a prerequisite for reading and writing, but, as Table 5 shows, in fewer than half of South African schools do Grade 6 children receive their own copies of maths and literature textbooks (Strauss, 2006).

These figures are confirmed by the PPP study, which found that only 45% of principals and 35% of Grade 6 maths and language teachers in Western Cape schools agreed that children are allowed to take textbooks and readers home (Taylor et al, forthcoming). The practice of not allowing pupils to keep books for the year is likely to impede learning, particularly among poor children, since it appears to be most prevalent in schools serving poor communities.

Table 5: Access to textbooks by Grade 6 learners

	Own Reading textbook	**Own Mathematics textbook**	**Mean**
Province	%	%	%
Eastern Cape	42.1	42.3	42.2
Free State	60.9	49.1	55.0
Gauteng	55.8	51.1	53.5
KwaZulu-Natal	40.3	39.9	40.1
Mpumalanga	44.8	34.6	39.7
Northern Cape	29.9	28.4	29.2
Limpopo	44.2	43.1	43.7
North West	35.4	24.7	30.1
Western Cape	49.1	36.9	43.0
South Africa	**45.6**	**41.1**	**43.4**

Source: Strauss, 2006

3.2.3 Promoting home educational practices

One important area over which school principals have some influence is educational practices in the home, where two factors are commonly associated with improved learning: reading and homework. In one of the early regression models run on the PPP data, the amount of reading undertaken by children was very strongly associated with school performance, with children who read once a week having an advantage of about 5 percentage points in the literacy test over those who do no reading at home; when reading is done 3 times a week the advantage is increased to 10 points, and those who read more than 3 times a week are likely to be about 12 points ahead (Taylor et al, forthcoming). In the full regression models the effects of reading at home are more muted, but remain strongly significant. On the question of homework, the PPP results indicate that children who do homework frequently have a performance advantage over those who do not. While this advantage is lower than that conferred by frequent reading, it is nevertheless significant.

4. Teachers and teaching

It is self-evident that what children learn is heavily dependent on what teachers know and do in their classrooms. This is especially true for poor children who get little support for schoolwork from their homes and little intellectual stimulation in their broader social

environments. In the words of Barber and Mourshed (2007), the quality of an education system cannot exceed the quality of its teachers, and the only way to improve outcomes is to improve instruction. Elmore and Fuhrman (2001) agree: in order to improve performance, all schools, no matter what their demographic characteristics or prior performance, must do different things, not just do the same things differently; these new things require new knowledge and skills, the larger part of which must be organised around instructional practice. Similarly, Leithwood et al (2004) are convinced that the successes of the English NLS and NNS were based directly on changes in the pedagogical practices of teachers, and indirectly on the practices of other system-level actors.

4.1 Teacher knowledge

One component of the SACMEQ programme was to test teacher knowledge. Of the 14 participating countries, only South African teachers refused to participate in this component. However, government initiatives such as the Dinaledi project, as well as donor-funded teacher development programmes are increasingly testing teacher knowledge as a means of assessing developmental needs and measuring the effect of the intervention. One example is the Khanyisa Programme which is working in 400 schools in 4 districts in the Limpopo province. (Taylor and Moyana, 2005). A baseline survey was conducted in 2004 in 24 primary schools selected at random in two rural districts. One component of the study was to administer a literacy and a mathematics test to Grade 3 teachers. The tests were constructed by selecting items from tests designed to assess the knowledge of Grade 6 learners. The average score on the maths test for 25 teachers was 10 correct responses out of 15 items (67%). Only one teacher scored 100% correct (15) while 3 scored below 50%. The average score on the language test for 23 teachers was 13 correct responses out of 24 items (55%). The majority of teachers scored between 7 and 12 marks out of a possible 24 (29% - 50%); 12 of the 23 teachers scored less than 50%, with a lowest score of 21,7%. Only one teacher scored higher than 75%.

A second example is afforded by the Integrated Education Project (IEP) which is working in 1000 schools in 4 provinces: KwaZulu/Natal, Eastern Cape, Limpopo and Northern Cape. Table 6 shows the scores achieved by teachers on tests conducted before and after the programme. Of great concern is the fact that, after four years of intensive training, consisting of 5 days of residential training per year, no teacher could achieve 100% on any test, while the minimum scores for all four tests are well below what the primary school curriculum expects from the average learner.

Table 6: Results of tests administered to teachers at the end of the IEP project, 2007

Subject	No. of teachers tested	Grades taught	Grade level of test	Teacher scores (%)		
				Min	Max	Mean
Literacy	46	1-3	1-6	58	94	75.6
Maths	63	1-3	1-4	14	73	39.7
Maths	67	4-6	4-7	10	73	32.5
Science	66	4-6	4-7	47	89	68.7

Source: Mabogoane and Pereira, 2008

The very low levels of subject knowledge exhibited by these teachers, not a representative sample but spread widely across the country, is only comprehensible if it is concluded that the teachers undertake very little or no self study from the textbooks which they have at their disposal: even a desultory reading of the many books available to teachers and seen in significant quantities in their schools, would take them to higher levels of knowledge than those shown in Table 6. If this is true then we must further conclude that teachers are exhibiting the same passive, dependency culture which we surmised is reflected in the laissez fair attitude of principals toward teacher absenteeism. A second and perhaps firmer conclusion to be drawn from Table 6 is that improving the subject knowledge of teachers is a slow process, even when undertaken in the relatively intensive form adopted by the IEP.

The same characteristics are exhibited by high school teachers: Stols et al (2007) tested a group of 27 secondary school teachers involved in a distance education course, and found that their mean score on a short test consisting of Grade 12 exam-type questions moved from 32.4% in the pre-test to 46% after the course. Presumably this group of teachers, self-selected for professional development, would be more highly motivated and therefore more knowledgeable than most: if this is true, then the pre-test score indicates that the majority of South African high school teachers would be failing the SC exam. This is an hypothesis that needs to be tested on a larger, more representative sample. Either way, the example confirms the urgent need to improve the knowledge of many teachers in both primary and secondary schools.

4.2 Teaching practices

4.2.1 Teaching style

Much has been written in South Africa for and against certain pedagogical styles. The majority of this work is descriptive, with few studies attempting to demonstrate generalisable effects in one or more of the sub-populations which constitute the school system. This is an international problem, as noted by the US Department of Education's Mathematics Advisory Panel:

> "All-encompassing recommendations that instruction should be entirely "student centered" or "teacher directed" are not supported by research. If such recommendations exist, they should be rescinded. If they are being considered, they should be avoided. High-quality research does not support the exclusive use of either approach."
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> (USDE, 2008, 44)

The sting in the tail of this quote is the way in which the Panel defines 'high quality' research, which remains a contested issue. There have always been tensions between the proponents of different research perspectives in the education field, but the debate

experienced a revival with the publication in 2002 of the report of the National Research Council, which listed 6 principles of scientific research (Shavelson and Townes, 2002). We will return to this issue below, when we raise the related question of the so-called evidence-based debate on schooling.

However, whichever niche the respective parties occupy in the battlefield around the definition of what constitutes scientific evidence in educational research, they could probably all agree that part of the problem in identifying teacher-level effects on learning is methodological: since children's learning is subject to a new set of teachers every year, demonstrating teacher effects empirically requires time series data, which relates the teaching practices of a particular teacher to any learning gains exhibited by her pupils over the time period in question. Thus, while the PPP study, a cross-sectional design with only one point of data collection, found strong effects at the levels of home educational practices and school management, few teacher effects were discernible.

In their descriptive study of 10 effective poor schools in South Africa, Malcolm and colleagues (2000) found two teacher-related features in the successful schools in their sample: the competent use of traditional teaching methods, and strong subject knowledge on the part of teachers. In their *Schools that Work* research analysis, which also adopted a broad-brush descriptive methodology in their 18 case study schools, Christie et al observed the widespread use of "conventional" teaching, with much "chalk and talk" evident in the classrooms of these poor but successful schools. Wanting to move away from what she terms "the rather crude and dichotomous from-teacher-centred-to-learner-centred thinking" which dominates curriculum debates in South Africa, Reeves (2005, 2) derived two types of pedagogical styles – visible and invisible – from the work of Bernstein. In the first, the teacher explicitly regulates the organisation, pacing and timing of learning; the teacher's authority is overt: criteria for evaluation of learner's written texts are specific, expectations are clearly defined, and the teacher gives learners formulas and procedures to follow. In invisible pedagogies learning takes place through the exploration and discussion of 'integrative' problems and 'real world' contexts where the learner is expected to be self-regulating, active, autonomous, and take responsibility for the organisation, pacing and timing of learning. The regulative or social context is apparently relaxed and the authority of the teacher is covert so that the teacher is transformed into a facilitator.

In her one year time-series study in 24 low socio-economic status (SES) schools in one district of the Western Cape, Reeves (2005; Reeves and Muller, 2005) compared the relative effects of pedagogical style and opportunity to learn on the learning gains in maths by Grade 6 pupils. This was a school effectiveness study on existing classes: regression analyses found that certain features of pedagogical practice are more important than overall pedagogic style in relation to learning gain. While much work remains to be done on teaching practices in the South African context, Reeves' results give some support to Bernstein's contention that a 'pedagogical palette' (2000: 70), in which elements of visible and invisible (or performance and competence to use Bernstein's respective terms) pedagogies are mixed to suit specific circumstances, is a more appropriate approach to teaching practice than the dichotomous perspective which

characterises much writing on this subject. While Bernstein's descriptions are analytical categories, Schoenfeld is more normative in his call for a middle-ground approach to the 'wars' in both reading and maths:

> "Any sensible person would realize that children need both phonics and reading for understanding. Either of the two perspectives, taken to extremes, is nonsensical. …. The same is the case in mathematics. An exclusive focus on basics leaves students without the understandings that enable them to use mathematics effectively. A focus on "process" without attention to skills deprives students of the tools they need for fluid, competent performance. The extremes are untenable."
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> (Schoenfeld, 2004: 280-1)

Running somewhat counter to this conciliatory tone, a second South African time-series study by Schollar (2008) investigated the effects of a direct-teaching approach to maths – emphasising the use of memorisation, mental arithmetic, drill and extensive practice, before extensions into more complex activities (games and puzzles) – in Grade 4 and 6 classes. A randomised field trial of the intervention in 20 rural schools showed that after 14 weeks of instruction using the materials (multi-grade teacher manuals and learner workbooks), the experimental schools registered very significantly higher learning gains than control schools. Net gains on pre-test scores by experimental schools were 50% in Grade 4 and 64% in Grade 6, which is in the order of at least twice the kinds of learning gains effected by donor-funded school intervention programmes in South Africa in the last decade (Taylor, 2007), although Schollar's Primary Maths Research Project (PMRP) is very much smaller in scale than most interventions.

Stols et al (2007) found a significant improvement in teachers' content knowledge (albeit under uncontrolled conditions) of 13.6% after a 120-hour *Mathematics for Teachers* distance education course based on a problem-centred learning approach.

The reading intervention in the Bitou 10 project, working in 7 primary schools across a wide SES range in Plettenberg Bay, has to date achieved remarkable mean gains of well over 100% in Grade 3 reading scores (Table 7).

Table 7: Percentage of children passing WCED Grade 3 literacy test in 7 Bitou primary schools

	A	B	C	D	E	F	G**	Mean Bitou*	Mean Province
2002	13	5	24	20	53	0	0	**23.0**	**35.7**
2004	23.5	2.5	27.5	17.5	42.5	28.6	46.2	**26.9**	**39.5**
2006	40.0	41.8	50.0	55.1	58.2	65.2	71.4	**54.5**	**47.7**
% Increase	207.7	736.0	137.8	275.5	9.8	undef	54.5	**136.9**	**33.6**

** Not tested in 2002; increase 2004-06; 2002 Bitou mean calculated using 2004 score for school G
* Unweighted means
Source: Taylor, 2008

Bitou 10 is a wide-ranging project established in 2001 and focused on improving school infrastructure, book provision, developing management expertise, and improving the

pedagogic skills of maths and language teachers. No movement has to date been detected in the Grade 6 reading scores or in maths scores at either Grade 3 or 6 levels. An evaluation of the programme attributes the outstanding improvement in Grade 3 literacy scores to an intensive intervention with teachers in their classrooms, using an emergent literacy approach to the teaching of reading and writing (Taylor, 2008). This method assumes that writing is key to the development of literacy: when children are encouraged to write about what they have read and experienced, it not only advances their reading skills, but develops their cognitive processes as well, as they search for words and syntactic structures to describe their experiences and express their feelings. The evaluation of the project found examples of the poorest children in project schools writing page-length stories by the end of Grade 1 (Taylor, 2008). The intensity of the Bitou project is unsustainable on any kind of scale much larger than ±7 schools, but what the intervention does show is what is possible: the poorest South African children are capable of reaching at least acceptable, if not good, levels of literacy, provided their teachers can be shown how to teach reading and writing effectively. The problem of dismal performance in reading and writing by South African children does not lie with the children; it lies in the teaching methods adopted by teachers, and the intervention shows that these methods are amenable to change. Of course, the problem remains: how can such gains be effected on a larger scale, so as to improve the life opportunities of the majority of children?

We now turn to a more detailed examination of elements of pedagogic practice in South African classrooms. As we have said, much of this data is of a descriptive nature; where otherwise, we will signal the type of data from which conclusions are drawn. We look at 5 factors of teaching practice: pacing and curriculum coverage, level of cognitive demand, explication of evaluation criteria, reading and writing.
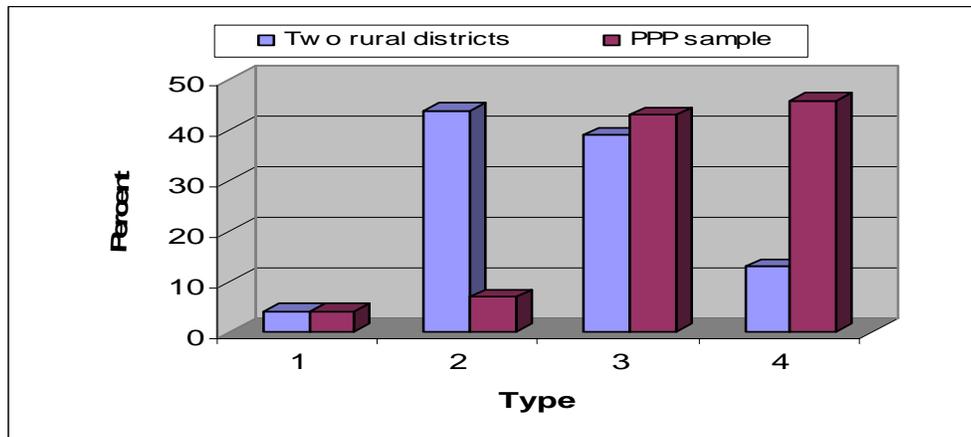
4.2.2 Pacing and coverage

In Reeves' time-series study in 24 poor SES schools she found that, while 47% of her sample experienced a pedagogical approach where the pace set was apparently very loosely bounded and appeared unconstrained by curriculum expectations, achievement gains across a single school year increased when teachers adjusted the pacing in their lessons in ways that were responsive to learners' levels of ability and progress. Reeves' data hints at the cumulative effects of curriculum coverage from one year to the next: coverage of grade 5 topics had a positive effect on pre-test scores of Grade 6 learners, indicating that, in relation to improving achievement outcomes of low SES learners, curricular pacing across time (inter-grade pacing over a number of school years) may be a more significant measure in relation to overall achievement status than gain across a single school year (Reeves, 2005).

A striking feature of most South African classrooms is the snail's pace at which teachers progress through the curriculum, sometimes spending a whole lesson reading two or three sentences or talking about two or three maths problems. This slow pacing results in low levels of curriculum coverage over the year, discernable through an examination of children's workbooks, which commonly contain very low volumes of writing, often

showing between 10 and 20 A4 pages completed over a school year. Curriculum coverage in mathematics was assessed in the Khanyisa baseline study (Taylor and Moyana, 2005) and the PPP (Taylor et al, forthcoming) studies by analysing the work done in all the exercise books of the best learner in each class observed. Topics covered were checked against those specified in the National Curriculum Statement. Observations were done in October and extrapolated to estimate coverage for the year This is a crude method of assessing coverage, which reveals neither the extent of coverage, nor the cognitive level at which the tasks identified in the work books are covered. The method of counting topics merely indicates whether these were addressed at all, at any level, for however brief a period during the year, and give no indication as to the adequacy of coverage. They are thus a best case scenario. Comparison between the results found for the two studies (Figure 1) must be done with circumspection: the Khanyisa figures reflect the situation in Grade 3 maths classes in 24 schools in two rural districts in one of the country's poorest provinces, while the PPP results are for Grade 6 maths classes in a 90-school stratified random sample in the most highly developed province. Nevertheless, they indicate the kind of spread which occurs across the country on this indicator of teaching quality. They also reflect the bimodal distribution of maths scores in the South African school population identified by a number of authors (Gustafsson, 2005; van der Berg and Louw, 2006b; Fleisch, 2008).

Figure 1: Curriculum coverage, mathematics

Key   4: ¾ or more NCS topics completed over year
          3: Between ½ and ¾ topics completed
          2: Between ¼ and ½
          1: Less than ¼ covered
Source: Taylor and Moyana, 2005; Taylor et al, forthcoming

Classes in only 45% of the PPP sample and 10% of the Khanyisa sample were on track to complete the curriculum for the year, while 42% of Khanyisa children and 7% of PPP children were heading to complete less than half the number of topics specified by the curriculum.

The practices reflected in Figure 1 show what could be termed macro-pacing, the extent to which the curriculum is covered over the school year. The day-to-day pacing of lessons is referred to as micro-pacing. Reeves (2005) found that achievement gain across a single school year increases where learners influence decisions around selection, sequencing and pacing: this is effected by the teacher adjusting micro selection, sequencing and pacing in her lessons in ways that are responsive to learners' levels of ability and progress.

4.2.3 Cognitive demand

According to Reeves (2005), a second factor of instructional practice which was significantly associated with higher learning gains was whether or not the teacher demanded higher levels of cognitive engagement, and engaged learners on the principles underlying mathematical procedures and not only on how the procedures work. This finding alludes to one of the most consistent conclusions in the very large literature on school effectiveness: setting high expectations at all levels, including engaging learners at high levels of cognitive demand in the classroom, is associated with improved learning.

4.2.4 Being explicit about evaluation criteria

An invisible pedagogical style tends not to be too explicit about what constitutes good learner performance, on the assumption that each learner is unique and may excel in any number of ways: assessment from this perspective is about presences rather than absences. A visible pedagogical style, in contrast, such as the one investigated by Schollar (2008), is clear about what is required: the criteria for assessing performance are explicitly stated. Reeves' (2005) analysis appears to confirm the view that, when responding to learners' knowledge displays, feedback by the teacher which explicates the evaluation criteria improves achievement gain; this effect is accentuated when teachers' use learner errors to provide explicit feedback on incorrect answers. Reeves further speculates that explicit feedback seems more important than explicit expositions of worked solutions and detailed demonstrations of procedures; however, the effect of explicit evaluative criteria was no longer significant in her combined regression model using all the significant variables from previous models. On the other hand, the effect of higher levels of cognitive demand (learner engagement with principled and not just procedural knowledge) on gain remained significant for the combined model, suggesting that, for most of the sample, the cognitive level of the teacher's expositions and feedback on error is the discriminating factor in relation to achievement gain.

> "What makes the difference in relation to gain for this sample of learners and their teachers is the teacher's ability to engage learners to a larger extent with principled and not just procedural knowledge when dealing with misconceptions or giving feedback on incorrect answers and when giving expositions."
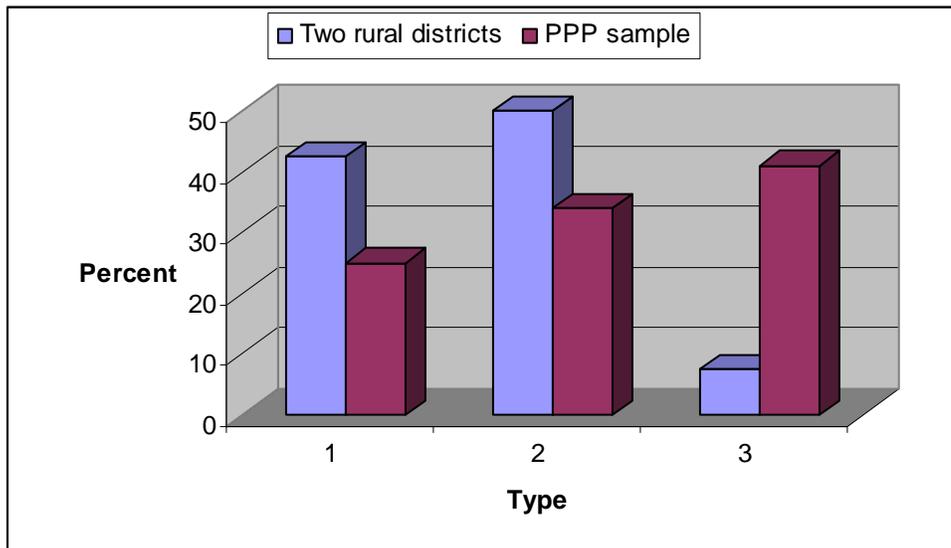>
> (Reeves, 2005, 12)

4.2.5 Reading

In the Khanyisa baseline study mentioned above, the practices of Grade 3 language and maths teachers were described in the 24 schools sampled, where 3 lessons on consecutive days were observed. Although books were available for both language and maths in all but two of the schools, no books were seen being used in 43% of language classes and 69% of maths classes. In only 8% of language classes and 9% of maths classes were learners seen engaging individually with books. The most common form of reading in these classes consisted of teachers writing 3 or 4 sentences on the board and then leading the reading of these, with children following in chorus.

The Khanyisa classes, drawn from the poorest rural schools, would constitute a worst-case scenario, although one which may exist in a large proportion of South African schools. Reading in Khanyisa Grade 3 language classes is compared with that in Grade 6 PPP classes, which are spread across the entire spectrum of schools in the Western Cape (Figure 2).

Figure 2: Observed reading practices in language classes

Key – 3: Independent reading by learners from books or worksheets
2: Teacher reads and learners follow in text
1: Teacher reads and children listen; no reading
Source: Taylor and Moyana, 2005; Taylor et al, forthcoming

Individual reading was not observed to happen in nearly 60% of PPP classes and over 90% of Khanyisa classes. The PPP observations were done in 2003, when the literacy strategy of the Western Cape Education Department (WCED) had not yet been instituted. The Khanyisa observations were undertaken in 2004, as a baseline study for a 7-year systemic intervention programme.

The resistance by South African educators to using textbooks burdens both themselves and their learners with a very serious handicap. A good textbook contains, in a single source, a comprehensive study programme for the year: it lays the curriculum out systematically, providing expositions of the concepts, definitions of the terms and symbols of the subject in question, worked examples of standard and non-standard problems, lots of graded exercises, and answers. There certainly are examples of bad textbooks in the country, but there are many good textbooks, and these provide the single most valuable teaching and learning resource. In the absence of textbooks children only see fragments of the curriculum, presented through stand-alone worksheets or isolated, short exercises written on the board. Not only should learners see and use textbooks every day in class, but they should be given the books to keep for the year so that they have access to the whole curriculum in an integrated form, and to which they can continually refer throughout the year.

4.2.6 Writing

As Figure 1 shows, learner books are the most revealing source of learning experience over any year of study. While teacher plans reveal the intentions of teachers, in the best case, or merely compliance with demands from district officials or school management, what actually happens is clearly set out in the learner workbooks. In their analysis of learner work in the Khanyisa baseline study, Taylor and Moyana (2005) found that in the majority of Grade 3 language and maths classes children engage in writing exercises no more than once a week. What little writing is done consists predominantly of exercises composed of isolated words; sentences are seldom seen, while longer passages are virtually non-existent. This study paid particular attention to the number of extended passages written by children, defined as writing consisting of paragraph length or longer, stories, descriptions, expressive passages, or transactional writing such as letters. We assume that, because it contains relatively complex thoughts, expressed through relatively complex grammatical structures, extended writing is the primary vehicle for developing children's cognitive processes and extending their literacy skills.

The frequency and quality of writing in literacy and maths in the Khanyisa and PPP studies are shown in Table 8 and Table 9. In two-thirds of Khanyisa literacy classes observed, children completed fewer than 3 extended passages over the year; a further 11% completed 3 to 5 passages and 22% completed 9 or more. In mathematics the number of 'complex tasks', defined as consisting of problems formulated in words and/or consisting of more than one step (e.g. $5 + 7 - 6$), were counted: 9% of classes observed had completed more than one complex exercise per week, 50% had completed around one per week, 18% had done around one per term, while in 23% of classes no such exercises were performed over the entire year. While the analogous figures recorded in the PPP study reflect a better situation, it is still notable that in only 17% of classes in the province are complex maths tasks undertaken around twice a week, and about once a week in a further 31%, and that in a good one-fifth of classes no complex tasks were

seen. Extended writing occurred twice or more often per term in 45% of language classes, and once a term or less in 33%.

Table 8: No. of extended writing passages in literacy classes per year

	Less than 3/y	3 to 5/y	Between 5 and 9/y	More than 9/y
Khanyisa (G3)	67%	11%	0%	22%
PPP (G6)			33%	45%

Source: Taylor and Moyana, 2005; Taylor et al, forthcoming

A detailed breakdown of the writing observed in Grade 3 language classes in schools participating in the Bitou 10 project in Plettenberg Bay in the Western Cape is shown in Table 9.

Table 9: No. of writing exercises Bitou 10 project – Grade 3 language
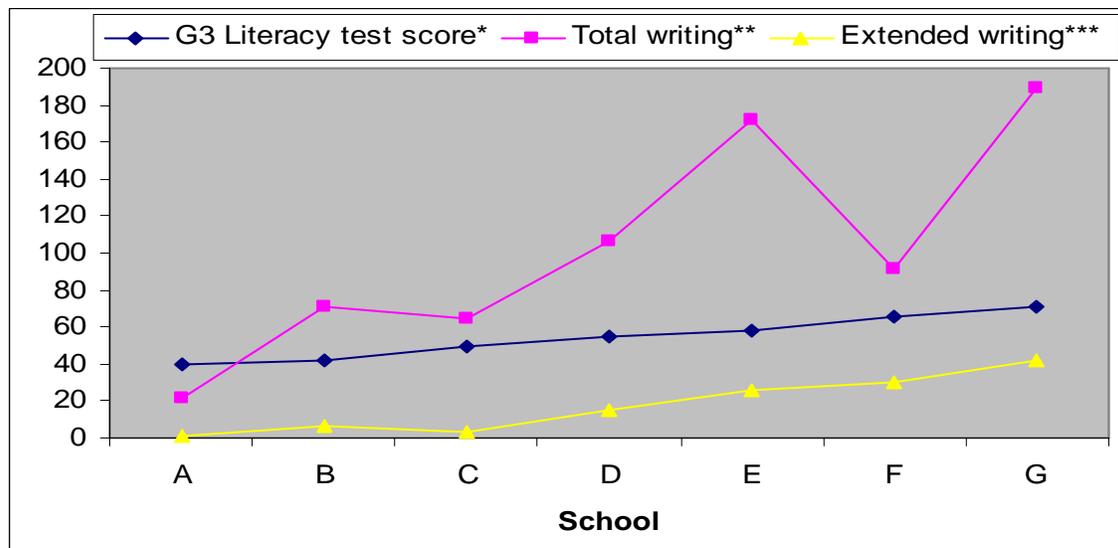
Type of writing	A	B*	C	D	E*	F	G
Words only	9	41	26	38	73	22	64
Sentences	5	17	28	41	61	17	65
Paragraph or longer	1	6	3	15	26	30	42
Other (tables, mind maps, etc)	6	7	8	12	13	22	18
TOTAL in 28 weeks	21	71	65	106	173	91	189
Average per week	0.8	2.5	2.3	3.8	6.2	3.3	6.8

* Mean of 2 teachers
Source: Taylor, 2008

The relationship between performance on the WCED Grade 3 literacy test and the quantity and quality of writing is shown in Figure 3.

Figure 3: Writing and literacy achievement, Bitou 10 project

Notes: * School mean score on WCED Grade 3 reading test, 2006
  ** Total number of written exercises completed in 28 weeks of school, 2007
  *** Total number of extended writing exercises completed in 28 weeks, 2007
Source: Taylor, 2008

The figures shown in Figure 3 need to be treated with caution, for a number of reasons. First, the scores on the WCED literacy tests are school means, while the degree of coverage and quantity and quality of writing are for a single class (or in the case of two schools, two classes) in the school, and do not include the children whose test scores are given. Furthermore, the sample is too small to talk with any confidence of a statistical correlation. What the graph does suggest is an association between the number of extended passages written over the year and literacy achievement, while the association between achievement and total writing is less convincing: this raises the hypothesis that the development of literacy skills is more likely to be propelled by extended writing exercises than by increased numbers of low level writing activities. The graph of maths scores on the WCED tests, degree of curriculum coverage and the number of complex writing exercises exhibits the same pattern as shown in Figure 3, suggesting that the development of maths performance is also driven by coverage of the curriculum and undertaking relatively complex writing tasks (Taylor, 2008).

5. *Conclusion*

South African children receive schooling of a significantly poorer quality than pupils in many of our much poorer neighbouring countries. This is true in all 5 poverty quintiles. A great deal of money should and is being spent improving the infrastructure and facilities in the country's poorest schools. In addition, the route to improved quality requires targeted spending on well designed strategies aimed at changing what teachers do in their classrooms, and what principals and officials at every level of the system do in providing guidance and direction to instructional improvement (Elmore, 2000). Improving what teachers do in their classrooms is the key to improved learning.

The first problem with the majority of South African schools is that they exhibit a culture which tolerates a very loosely bounded timetable: teachers and learners come and go as they please and teaching happens desultorily. Children in these schools are socialised into giving little value to efficient work habits, and to having very low expectations of their own intellectual development. It would seem that something in the order of 80% of the nation's schools fall into Hopkins et al's (1997) Type I category of school growth states. These failing schools are unable to help themselves. Rewards and sanctions have no effect because, as Elmore (2003, 2004) puts it, they do not have the internal accountability systems required to meet external accountability conditions. Internal accountability refers, in one sense, to the extent to which the institution is coherently focused on teaching and learning, maximises time for these activities, and organises its internal systems around improving instruction. Calhoun and Joyce (1998) identify a prior meaning of internal accountability, which depends on the kind of teacher values prevalent in the teacher corps: only when there is a high level of internalised professionalism do teachers accept the responsibility for implementing reform themselves. But building effective internal accountability systems is a difficult process and, according to Hopkins et al, not easily achieved without outside intervention and support. In many cases, the first thing to do is to replace the principal and to stabilise school organisation. There

should be a clear and concerted focus on a specific, limited number of factors: tightening up attendance; the timetable and learning course must be organised; and specific and intensive teacher reskilling focused around how to run a classroom, plan seating, run a timetable, and use resources. Above all, though, as Hopkin and his colleagues stress, these schools should be given space, and external pressure withdrawn for a specified period, in order to allow the development plan to be put into effect because, in the end, if the school does not own the strategy it cannot be made to work.

But who would undertake the task of initial intervention in the tens of thousands of failing schools in South Africa? The obvious answer is provincial and district-level structures. However, most of these offices are ineffective, largely flaccid organisations, unwilling for political reasons, or unable for technical reasons, to intervene decisively in schools; the majority lack educational authority, based on expertise, and most are in the same dysfunctional state as the failing schools they purport to administer. According to Christie et al (2007), the well-performing poor schools they visited are known to their districts, but do not necessarily draw support from districts; one of the principals remarked that District Officials who visited the school said they learnt from what they saw; in many of the schools, the lack of subject advisory support was mentioned as a problem. Principals and management staff expected expertise to be provided by the District Office, but often the training provided on the curriculum (especially NCS) was felt to be too little and of poor quality. The authors conclude, that:

> "[w]ithout a thorough and ongoing relationship with the District Office, which would include training, advice, and inspections, an important part of the systemic accountability and improvement system is missing."

> (Christie et al, 2007, 85)

Large parts of the system are therefore in a state of paralysis, and for this reason donors are ceasing to support poorly functioning schools, and even central government, through its Dinaledi project which targets those few poor schools which do provide value for money, acknowledges the difficulty of improving the functionality of the country's failing schools in the short term. A priority for improving district impact, therefore, would be to develop organisational development, monitoring and support skills among those officials responsible for school governance and management, and to hold them accountable for the efficient management of their schools. At the same time, subject training of subject advisors is needed to enable them to assess teacher knowledge and performance, and to provide adequate support to teachers.

Once schools break through to Hopkins et al's Type II status, curricular interventions should take centre stage. Improving learning outcomes is dependent on two instructional tasks: setting up effective curriculum management systems at the school level, and improving instruction in classrooms. Principals must take responsibility for leading the learning programme, through directing, supporting and monitoring curriculum delivery. Unfortunately, instructional leadership is an area in which we have only hypotheses to guide the work of school leaders. What little research is available in South Africa points

to four sets of factors as important in instructional leadership. The first is to establish and maintain a climate in the school which values teaching and learning as the central tasks of the institution, success in which is reflected in learner performance. The Education Laws Amendment Act (RSA, 2007) is likely to assist in this process, by making it clear that the main purpose of the school is learning, elevating it above the myriad of other priorities with which principals are besieged daily. The law places accountability for learning squarely with the principal, making it mandatory for heads to report annually on the state of learner performance in their schools, to formulate a plan for improving learning, and to report progress against the school plan in June. But many principals will need assistance in operationalising these regulations, and this is another main area in which district officials can provide support to schools.

The second task of school-level instructional leadership is to develop a culture of reading and writing. Schooling is essentially about developing high levels of literacy in language and other school subjects, and literacy without books, by definition, is not possible. Poor children live in text-poor environments and for most the school offers the only means of accessing books. Yet, while many schools do have supplies of books, they are not made freely available to children and they are very seldom used in class. Textbooks must be issued to learners for the year so that they are available at any time. Writing is the other half of literacy and frequent writing, of different kinds, with an emphasis on extended passages, must be part of curriculum planning and monitoring.

Third, in ensuring curriculum coverage, a balance needs to be struck by school leaders between planning and assessment that is sufficient to guide delivery, on one hand, but not too onerous so as to distract from the main task of teaching, on the other. It follows that monitoring curriculum coverage is best done through tracking outcome measures, such as the quantity and quality of learner reading and writing activities, and regular tests benchmarked to the curriculum standards, rather than to insist on voluminous input measures, such as the many levels of planning and assessment which characterise current approaches to school improvement. In this regard, it is clear that in schools which maximise learning time, teacher tasks such as planning, preparation, setting and marking assessment exercises, and other administrative and extra-curricular activities are done outside of school hours.

A fourth promising area of instructional leadership would be to establish in- and out-of-school systems of curriculum support to teachers. Heads of Department should be appointed on the strength of their subject expertise, and they must provide opportunities for teachers to improve their subject and pedagogic knowledge, through individual and small-group mentoring, establishing peer support groups, and commissioning in-service training from teachers within the school, from external service providers or from district-level subject advisors. A prominent element of successful large-scale school improvement programmes such as the English NLS & NSS (Earl et al, 2003), and New York District #2 (Hubbard et al, 2006; Darling Hammond et al, 2006; Elmore and Burney, 1999) was the provision of subject experts, over and above any support supplied by district officials, who worked directly with teachers in their schools and classrooms.

All school effectiveness and improvement research points to the fact that instructional improvement is what makes the difference between more and less effective schools (see, for example, Scheerens, 1998). While school organisation provides the prerequisite conditions for effective learning, it is in the classroom that learning happens, and classroom level variables account for a far greater proportion of learning variance than school level factors. But which are the key pedagogical levers? The evidence is strong that teaching in most South African schools is very ineffective, moving too slowly and at too low a cognitive level to cover anywhere near the demands of the curriculum. But what to do about this, while the subject of the most strongly held views, is not well served by firm evidence in favour of any particular approach. The evidence presented above, while too skimpy to provide clear guidelines, suggests four levers for improving teacher quality.

The starting point for improved teaching and learning is that teachers must take responsibility for the learning outcomes of their pupils. This will involve a change of attitude on the part of teachers, from one which blames their situation on forces outside themselves (lack of resources, lack of support) to one in which they feel they can improve their own situation by exercising enterprise and energy. Effecting such a change will be a massive task: as Christie and her colleagues (2007) note, the teaching profession is in crisis. Teacher motivation is very low, with the profession at the bottom of the choice list for young people, in strong contrast to the situation in countries with successful school systems, where teaching is a high status profession and a first choice career path for the very best school leavers (Barber and Mourshed, 2007). In a strongly unionised country such as South Africa, teachers unions and the relationship between the public service and the unions are key to building a better professional climate. Targeting instructional capacity in a way that tries to deal with professional values requires interventions that are both technical and cultural: "Interventions propose to change what teachers and students know, believe, and can do, hence they operate by means of ideas, beliefs, professional norms, and intellectual practices" (Cohen and Ball, 1999, 32).

A second area which offers a lever for instructional improvement concerns the subject knowledge of teachers. Every indication is that the subject knowledge of many teachers does not meet the curriculum standards set for the children they are teaching. It goes without saying that teachers cannot teach what they do not know, and improving the subject knowledge of teachers must be a top priority for any intervention. However, the very low levels of subject expertise exhibited by a significant number of teachers indicates that they do little or no reading in the subjects they are teaching, and the first step on the road to improved knowledge must be for these teachers to develop a sense of agency about their own learning. It is just not possible for any programme to train teachers on every aspect of the curriculum they are responsible for, and use of a good textbook would greatly assist the teacher, not only with daily lesson planning and to achieve curriculum coverage, but, most importantly, provide the most accessible source for learning those parts of the subject that are new to the teacher, or which she may have forgotten since her own school or college days. The fact that South African teachers have such an aversion to the most important teaching and learning resource, when we have the money to buy books for every child, and indeed when most schools have at least some

supplies of books, remains one of the most damaging aspects of post-apartheid education. Teachers have turned their backs on what is common practice around the world: teachers adopting a single text and allowing this to be at once their year plan, the source of their activities and their interpretation of the curriculum.

However, this is not to place all responsibility for teacher knowledge in the court of teachers. Certainly, many teachers require development and support, and it is clear that short courses of the order of 3-5 days have little impact. It is becoming apparent that intensive in-service training, in the order of weeks per year, is required to equip teachers with the knowledge they need to teach effectively. The scale of this task is enormous, and its achievement inconceivable without active and well-capacitated districts to which much of the on-going support to teachers can be devolved.

Furthermore, subject knowledge is only one aspect of what teachers need to know: many are obviously using methods which are ineffective. This is the aspect of teaching about which least is known and research is urgently needed to identify teaching technologies that work in South African classrooms. In the meantime, the maths and reading wars continue to confuse teachers. South Africa, along with the rest of the world, is entering an era of evidence-based policy and practice, but whether this will indeed provide the scientific bedrock on which to found improved teaching (Slavin, 2008), whether we settle for a less ambitious and more gentle 'evidence-informed discussion' (Fleisch, 2008), or whether this terrain too will degenerate into yet another tower of postmodern Babel in which protagonists talk past each other, remains to be seen.

A third area which offers itself as a lever for improving instruction is emphasising reading and writing in all subjects, but particularly in language and maths. The purpose of schooling is to procure, process and produce text: learning the habits of mind and skills required for the symbolic manipulation of knowledge. Towards this end, primary school children must read around 5 books every term in language, and write every day in every subject, including at least two pieces of extended writing a week, one in language and one in another subject.

Finally, pacing the curriculum so as to achieve the required learning over the year is an art which few South African teachers manage satisfactorily. The Foundations for Learning Campaign (FLC) (DoE, 2008) details a coherent set of targets, time allocations, activities and resources required to improve reading, writing and calculating in primary schools by 2011. The FLC specifies the roles of the national and provincial departments of education and of districts, and its elements are compatible with the recommendations made above for improving curriculum management and classroom teaching. However, at this stage the campaign looks more like a policy-by-diktat approach than a costed implementation plan, and, because of the long lead times needed to achieve the ownership and cultural changes required in a massive enterprise such as this, the timeframes set for achieving the ambitious goal of average learner performance in literacy/language and numeracy/maths of 50% by 2011 are very optimistic indeed. For example, the Literacy and Numeracy Strategy initiated in the Western Cape in 2006, has raised literacy scores across the province at both Grade 3 and Grade 6 levels, where it is

already closing in on the FLC target, but has made no inroads into the disastrous achievement in maths (Table 10).

Table 10: Results of biannual testing in the Western Cape, percent learners attaining 50%

		Literacy/language	Numeracy/mathematics
Grade 3	2004	39.5%	37.3%
	2006	47.7%	31.0%
Grade 6	2005	42.1%	17.2%
	2007	44.8%	14.0%

Source: Schreuder, 2008; Dugmore, 2008

Nevertheless, initiatives such as the national Foundations for Learning Campaign, the Western Cape's Lit/Num Strategy and the Accelerated Programme for Language, Literacy and Communication of the Gauteng DoE are certainly on the right track. But the extent to which they succeed will be heavily dependent on, first, the extent to which a culture of professional agency can be developed in principals, teachers and officials throughout the school system and, second, on the extent to which such a newly motivated system is able to direct and support teachers to dramatically improve their delivery of the curriculum.

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