



**Consortium for Research on
Educational Access,
Transitions and Equity**

**Seeds of Their Struggle:
The Features of Under- and Overage Enrolment Among
Grade 4 Learners in South Africa**

**Nick Taylor
Thabo Mabogoane
Jennifer Shindler
Bina Akoobhai**

**CREATE PATHWAYS TO ACCESS
Research Monograph No. 47**

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**University of the Witwatersrand
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Consortium for Research on
Educational Access, Transitions & Equity

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List of Acronyms

GER	Gross enrolment ratio
GPI	Gender parity index
JET	JET Education Services
NGO	Non-government organisation
NSED	National School Effectiveness Study
SE	Systemic evaluation
SES	Socio-economic status
UNESCO	United National Educational, Scientific and Cultural Organisation

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Preface

This research monograph is one of several in the CREATE Pathways to Access Series that explore retention and progression in primary schools. Nick Taylor, Thabo Mabogoane, Jennifer Shindler and Bina Akoobhai explore the features of under-age and over-age enrolment among Grade 4 learners in South Africa. One of the features of post apartheid education in South Africa is relatively high degrees of access in the primary schooling phase since 1994. However while large numbers of children are in school South Africa displays some specific features which highlight the relevance of the CREATE zones of exclusion model. Meaningful access as defined by CREATE, includes regular attendance, levels of achievement consistent with curriculum objectives, and completion at or near appropriate age levels. One of the major policy concerns in South Africa is that too often schooling is interrupted and learning days lost. Levels of achievement on national and international comparative studies suggest that many learners fall well short of expected outcomes, and that over-age enrolment and progression remains significant.

This study explores the relative proportions of children who are at the right age for the grade and are either over-aged or under-aged, the poverty range and gender balance of each group, and their respective performance in literacy and numeracy. Using data from the national school effectiveness study, (NSES) the investigation follows a group of learners in Grade 3 in 2007, Grade 4 in 2008 and Grade 5 in 2009. The study provides new and important insights into progression in South African schools and more specifically in relation to the slow progress of learners through the grades, the performance of over-age learners and the socio-economic and gender characteristics of such learners. The conclusions provide significant policy insights into how some of these features can be addressed focusing in particular on the role of pre-primary schooling and grade repetition. The study makes an important contribution to an under-researched area of South African schooling.

Professor Shireen Motala
University of Johannesburg
CREATE South Africa Project Leader

Summary

This paper examines the question of over- and underage children in South African schools in the fourth grade. We look at the relative proportions of children who are at the right age for the grade and either over or under aged, the poverty range and gender balance of each of these fractions, and their respective performances in literacy and numeracy.

The data is drawn from the National School Effectiveness Study, a research programme which followed a cohort of learners through grades 3, 4 and 5 in a random stratified sample of 268 South African schools from 2007 to 2009. The paper reveals that a high number of children are not experiencing meaningful learning, and so are failing to master basic skills in literacy and numeracy, and not progressing through the grades at the appropriate ages.

This suggests that although the majority of South Africa's children complete nine years of basic education, South Africa's exclusion problems, that grow significantly in the last three years of secondary schooling, are being laid down in CREATE's zone 3: children are enrolled in primary school but not make sufficient progress to keep up with their peers, thus falling progressively behind, repeating grades and posing a high drop-out risk. By Grade 4 35% of children are overage, although it is not clear what fraction is due to late school entry, and how much is the result of grade retention.

It is clear that learner scores on the NSES literacy and numeracy tests confirm what every other testing programme tells us about the poor state of learning which characterises the system: the seeds of low pass rates at Grade 12 level, and of low participation and throughput rates in further and higher education, are sown in the first three years of schooling. What the present study adds to this picture is that overage children perform less well than their appropriately aged peers, gain less learning from one year to the next, generally come from poorer homes than their appropriately aged peers, and are predominantly male. This is a major problem in the system, and giving explicit attention to it must constitute a significant component of any strategy to address the very poor learning outcomes of the school system, the slow progress of learners through the grades, and the high rate of dropouts in the last three years of the secondary school.

What is to be done? First, in order to help low performing learners to achieve at acceptable levels, interventions must begin in the first three years of schooling and before. Access to good quality early childhood development programmes is essential as there is growing evidence that learners who have participated in such programmes or some pre-primary schooling, do better in school than those who have not. Second, the question must be asked whether grade repetition that involves receiving the identical learning programme received the previous year is beneficial, or whether a remedial programme would not be more appropriate.

Seeds of Their Struggle: The Features of Under- and Overage Enrolment Among Grade 4 Learners in South Africa

1. Introduction

The age of a child in any grade is a function of the entry age and the rate of progress in previous years. Progress is determined by the extent to which the child repeats any grade: Repetition of school years is understood by teachers and principals as an effective remedial mechanism, giving learners an opportunity to 'catch up'. However, the benefits of repetition are questioned by many, who stress that a child for whom a year of schooling has been unproductive is unlikely to benefit from repeating exactly the activities which have proved so unproductive (Kenny, 1991; Jimerson et al, 2002; Alexander et al, 2003; Department of Education, 2008). Nevertheless, accepting that it is the policy in South Africa, repetition is associated with a combination of factors relating to the individual child and her social circumstances, with the incidence of overage learners having a persistent association with poverty (Social Surveys, 2010; Department of Education, 2008). South Africa shares with many poor and middle-income countries high rates of grade repetition in Grade 1 (Department of Education, 2008), and therefore overage enrolment will be high. Similarly, large numbers of under age children in the early grades have historically been a problem in the system (Taylor, 1989), although with the phasing in of a pre-school year (Grade R) and the enforcement by government of minimum age regulations, this problem has diminished to negligible proportions.

The Consortium for Research on Educational Access, Transitions and Equity (CREATE) has suggested a framework for analysing the various spaces where children are 'included, excluded, or are at risk' (Lewin, 2007:21). In terms of this framework six 'zones of exclusion' are identified in order to locate 'those who are losing or have lost access to conventional education systems' (Lewin, 2007:21). The zones range from zone 1, which includes those children who have never and will never attend school to zone 6 which includes children who are enrolled in secondary schools, but are at risk of dropping out.

For CREATE (Lewin, 2007:21), getting access to education is meaningless unless it results in:

1. Secure enrolment and regular attendance;
2. Progression through grades at appropriate ages;
3. Meaningful learning, which has utility;
4. Reasonable chances of transition to lower secondary grades, especially where these are within the basic education cycle; and
5. More, rather than less, equitable opportunities to learn for children from poorer households, especially girls, with less variation in quality between schools.

This paper examines the question of over- and underage children in South African schooling in the fourth grade. We look at the relative proportions of children who are at the right age for the grade and either over or under aged, the gender balance of each of these fractions, and their respective performances in literacy and numeracy. The data is drawn from the National School Effectiveness Study, a research programme which followed a cohort of learners through grades 3, 4 and 5 in a random stratified sample of 268 South African schools from

2007 to 2009. The paper reveals a high number of children are not progressing through the grades at appropriate ages, that meaningful learning is not taking place and so basic skills are not being mastered. This suggests that although the majority of South Africa's children complete nine years of basic education, including two years of junior secondary school (Department of Education, 2008), South Africa's exclusion problems, that begin to emerge in the last three years of secondary schooling, are being laid down in CREATE's zone 3 (children are enrolled in primary school but are 'at risk' of dropping out as a result of repetition, low achievement, and silent exclusion from worthwhile learning).

1.1 Definitions of over- and underage children

Although there is some variation around the world on the issue of entry age, South Africa follows general practice in other countries by admitting children into Grade 1 at age five, turning six by the 30th of June in the year of admission (Republic of South Africa, 2002). Thus, in any one grade there will be two dominant age fractions: for Grade 1 there will be those children whose birthdays fall before 30 June of the admission year, aged six, and those whose birthdays fall after 30 June, aged five: the proportions of these two fractions will shift over the course of the year, as five-year olds turn six and six-year olds turn seven. In Grade 4, therefore, during the first half of the year children will be aged eight or nine, and after June they will be nine or ten. One can therefore talk about the younger and older fractions of those who are appropriately aged for the grade. Children whose ages fall outside of these two fractions will be over- or underaged for their grade.

The phenomenon of overage children arises through learners not keeping pace with their peers in progressing from one grade to the next, generally through grade retention, or failing to achieve the learning standards for the grade. South African regulations permit learners to repeat a grade only once per phase (phases occur in three year cycles) (Department of Education, 1998b:5). Children younger than the admission age may be admitted to Grade 1:

if it can be shown that exceptional circumstances exist which necessitate the admission of an underage learner because admission would be in his or her best interest; and (ii) the refusal to admit that learner would be severely detrimental to his or her development. (Republic of South Africa, 2002:4).

This clause makes provision for the existence of underage children in the system, although jumping through the procedural hoops is likely to deter most parents.

2. The phenomenon of over- and underage enrolment internationally

The problem of overage learners commonly affects disadvantaged children in all school systems: in the United States, African-American, Hispanic and other poor children in inner-city schools are particularly prone (Blue & Cook, 2004; Lehr et al, 2004; Martin & Halperin, 2006; Shannon & Bylsma, 2006; Kennelly & Monrad, 2007; Advocates for Children of New York, 2008; SECC, 2008; Dallas Morning News, 2010). In Haiti the problem is very acute, with nearly half of all children enrolled in the first two cycles of basic education (the first six years) above the normal age for the cycle (UNESCO, 2000).

In Ghana overage enrolment is considered to be a fundamental problem that remains deeply rooted in basic education, negatively affecting attendance and completion. Akyeampong et al (2007:27) found that overage enrolment per grade in Grade 1 to Grade 9 ranged between 50% and 76% in 2002. Underage enrolment also exists in Ghana, but not to the same extent as overage enrolment: in 2002 underage enrolment ranged as high as 16% in Grade 1 dropping to 5% in Grade 8 (Akyeampong et al, 2007:27), presumably as repetition takes its toll. India also experiences a problem with both overage and underage learners. According to Govinda & Bandyopadhyay (2008) 21.4% of Grade 3 children in India were overage, with the figure rising to more than 35% in two states. However, they note that a large number of children below the age of five are enrolled in primary education.

According to the study carried out in Malawi by Kunje et al (2009), using step-wise regression analysis of a range of variables, one of the factors found to be associated with learner performance was the age of the learner: learners at an appropriate age performed consistently much better than those who were underage or overage. Surveying a range of studies that compared the two fractions of any age appropriate cohort, Carroll (1963) found that the older children scored better through grades one to ten, got better ratings from their teachers and progressed more successfully from one grade to the next. Similarly, using scores obtained by learners aged 15 in an OECD survey conducted in 2003 for PISA¹, Sprietsma (2006) found that older learners exhibit significantly higher test scores than their younger peers. These findings were confirmed by Grissom (2004), who concluded that older-age peers perform better academically than their younger classmates; however, in contrast to Carroll, who found that the advantage persisted throughout the grades, Grissom concluded that any advantage had disappeared by the 10th grade. Nevertheless, according to Cascio & Schanzenback (2007), many parents ‘red-shirt’ their children, that is, provide them with an extra year to grow bigger and smarter before starting kindergarten. Fentiman, Hall, & Bundy (1999 and 2001, quoted in Akyeampong et al. 2007:51) found a similar situation in Ghana with enrolment in primary school.

Overage enrolment patterns can be problematic. For Lewin (2007:27):

... overage entry and progression delays primary school completion to ages where boys and girls may be subject to growing pressures to contribute to household income and to enter into marriage’.

This view is supported by Jimerson et al (2002:443), who in a review of literature on dropping out of school, found that grade retention was “the strongest predictor of later dropout status”. Lewin (2007:27) also notes that the wide age ranges that are a consequence

¹ Programme for International Student Assessment

of overage entry into school and repetition raises questions about appropriate pedagogy and cognitive strategies in the curriculum. He also points out that there may be social and behavioural consequences that stem from wide age (and presumably capability) grouping that result from repetition.

2.1 Over- and underage enrolment and survival rates in South Africa

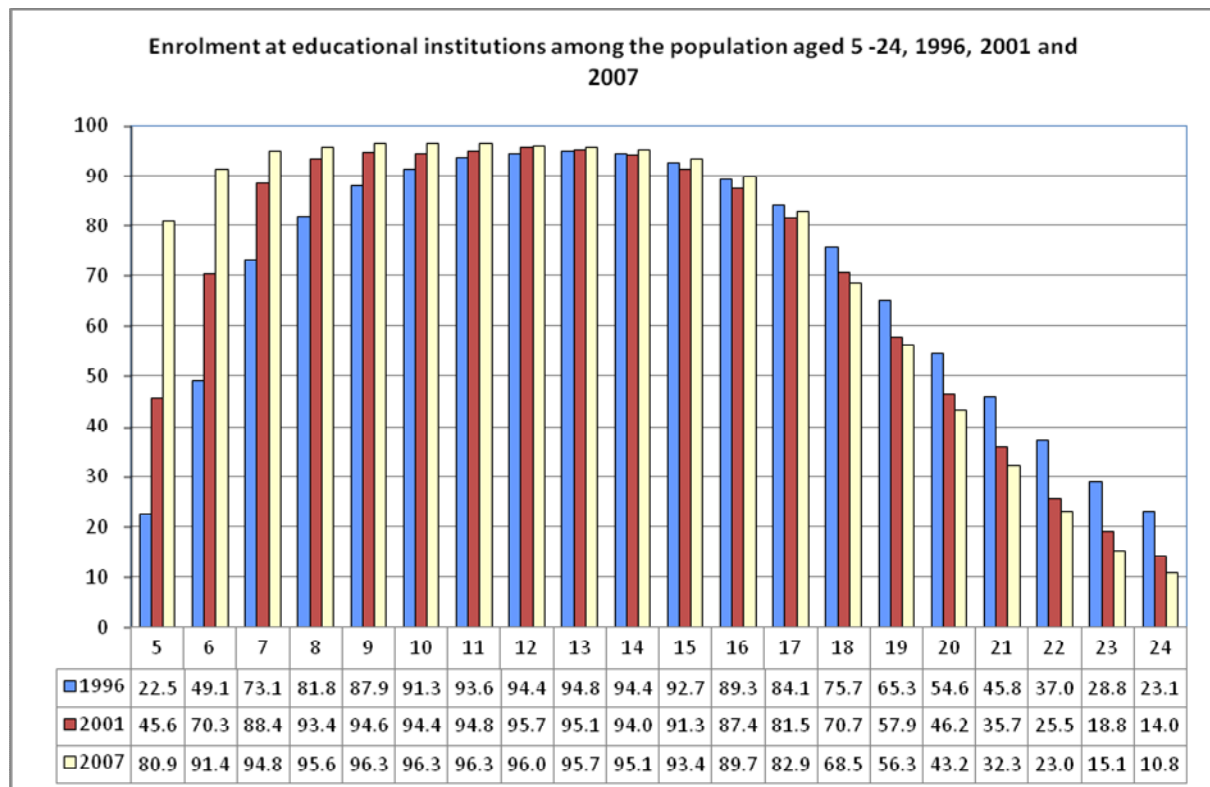
School participation is very high in South Africa and has grown substantially since the early 1990s, increasing by 14.3% between 1991 and 2009 (Shindler, 2010). Most of this growth was due to the rapid expansion of secondary education, which increased by 52.7% over this period, an average annual increase of 2.4% a year. The biggest period of growth in learner enrolment occurred between 1991 and 2000, with the build-up to, and implementation of democratic governance in South Africa and the widening of access to education after 1994. During this period, primary education enrolment increased by almost five percent and secondary enrolment by 41%. After 2000 the rate of increase slowed down. Primary education recorded a negative growth, decreasing by an average of 0.6% a year between 2000 and 2009. By 2009, there were one percent fewer learners enrolled in primary school than there had been in 1991. While enrolment in secondary education continued to grow after 1999, the rate of growth was much slower than during the preceding period; between 2000 and 2009 secondary enrolment increased by 8.3% or an average of just less than one percent per annum.

Several reasons have been put forward for the slow-down or decline in enrolments after 2000: a decline in fertility rates since the late 1970s (Simkins, 2002:1); primary enrolment reaching a natural saturation point (Perry & Arends, 2004:304); the stabilisation of school enrolment after a massive influx of previously excluded learners during the period of transition to democracy in the early and mid-1990s (Shindler, 2005:41); and the implementation in 2000 of a policy to reduce under- and overage enrolment and high repetition rates throughout the public school system (Department of Education 1998a and 1998b).

With the rapid expansion in enrolment, South Africa has a participation rate of 95% for children in the compulsory school age. This is on a par with, or even above, what is considered to be a feasible target for participation in education, especially for a developing country (Hawes 1983:132, Colclough & Lewin 1993:18-19).

Nevertheless, the participation rate of children no longer covered by compulsory education (those aged 16 to 18 years), is still a cause for concern. From the age of 16, participation in education begins to decline: 89.7% of 16 year olds, 82.9% of 17 year olds and 68.5% of 18 year olds were enrolled in an educational institution in 2007 (see Figure 1). Despite the fact that enrolment in the further education and training (FET) phase has increased steadily, there has been very little improvement, if any, in the participation rate of learners in the 16 to 18 year age group, indicating that the increase in enrolment in the FET phase over this period has not kept pace with the increase in the population of 16 to 18 year olds. Between 1996 and 2001 the participation rate of 16, 17 and 18 year olds declined. Although the participation rate then increased slightly for 16 and 17 year olds in 2007, it continued to decrease for 18 year olds.

Figure 1: Participation rate at educational institutions among the population aged 5-24, 1996, 2001 and 2007



Source: Statistics South Africa, (2007)

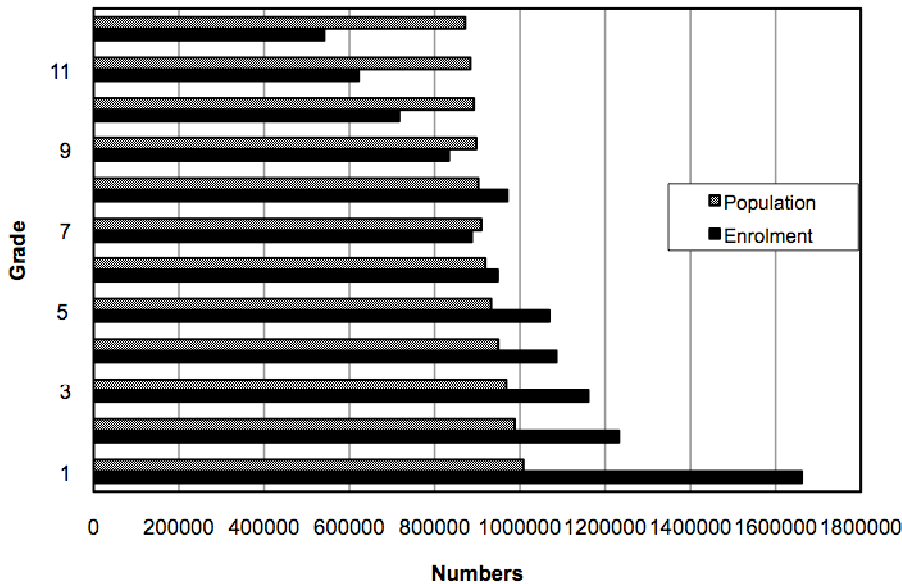
Several factors could account for the decline in the participation rate among this age cohort: firstly, it could be a result of the normalisation of enrolment in secondary education after the huge influx of learners in the 1990s, when learners, who had previously been excluded from education under apartheid, entered school; secondly, the implementation of the age-grade regulations in 2000 resulted in many learners who were 16 years or older but still enrolled in primary school or in the lower secondary grades dropping out of school; thirdly, there may have been a big drop-out of learners in this age cohort in the early part of the 2000s as weak Grade 11 learners were discouraged from progressing to Grade 12 if it was thought that they might not pass the matric examination; and, fourthly, there was a substantial decline in the number of learners repeating matric from twelve per cent of candidates in 1999 to only one percent of candidates from 2000 onwards (Shindler & Beard, 2001:2; Shindler, 2005:41-42).

The problem of underage and overage enrolment and low survival rates in the early years used to be a major problem in the South African system (Taylor, 1989). These features are apparent in a comparison of school enrolment by grade with the population of each respective age cohort: in 1995, the number of children in school exceeded the population by some margin for the first few grades, most notably in Grade 1, where over-enrolment stood at 165% of the age cohort (see Figure 2).

The main source of this problem was that, in the absence of preschools in the eighties and nineties, parents would ‘park’ their five, four and even three year olds in primary schools, using these as cheap baby-sitting facilities. Many of these children, not ready to benefit socially or intellectually from schooling, would ‘churn’ in and out of the system for two or three years, making very slow progress through the grades. Repeaters also contributed to the

problem, but by far the biggest factor was underage enrolment. Besides diverting valuable resources away from improving the quality of schooling for those children mature enough to benefit from it, these underage learners clogged up the pipeline, making teaching and learning even more difficult. It was only towards the middle and top end of high school that the number of enrolments dropped below the age-appropriate population in 1995.

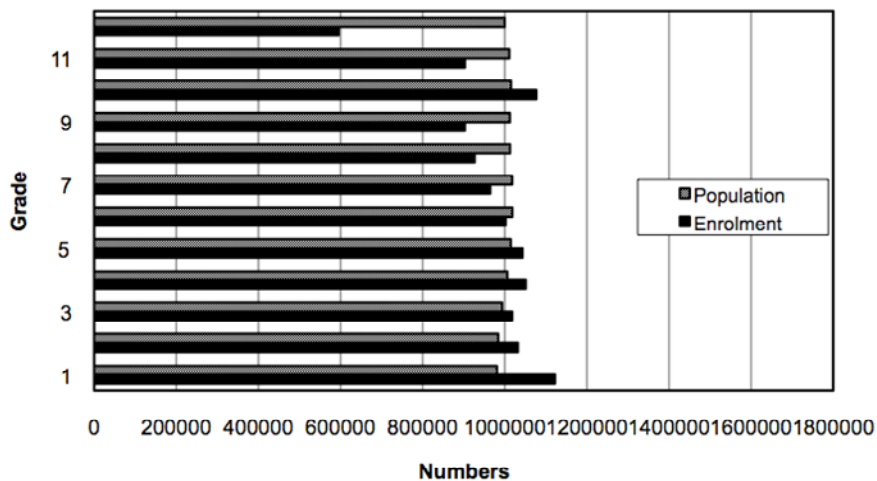
Figure 2: School enrolment by grade vs grade appropriate age population, 1995



Source: Crouch, 2010

By the end of the first decade of the 21st Century the picture is quite different. Thanks largely to implementation in 2000 of a policy to reduce under- and overage enrolment and high repetition rates throughout the public school system (Department of Education 1998a and 1998b), together with the rapid expansion of the preschool system, enrolments are now much closer to the age cohorts (see Figure 3).

Figure 3: School enrolment by grade vs grade appropriate age population, 2008



Source: Crouch, 2010

While there is still some over-enrolment in the primary grades, this has been drastically reduced, resulting in a much more manageable system and more efficient use of resources. In Grade 1, for example, over-enrolment has dropped from 165% in 1995 to 108% in 2008. At the same time, the numbers of children who continue their schooling into secondary school and complete nine years of schooling have increased markedly from 72% to 86% (Department of Education, 2008:xix), another important achievement for the post-apartheid government.

An interesting characteristic of South African education is that, unlike many other developing countries, access to schooling in South Africa has been achieved equally for male and female children. With an overall gender parity index (GPI) of 1.01 across the schooling system, there is very little difference in the rate at which males and females of official school-going age participate in schooling (Department of Education, 2010). Research by Shindler and Fleisch (2007) and the Department of Education (Department of Education, 2008:30,47) have found that the throughput of male learners is more problematic than that of females, and this is evident in the shift in the GPI from primary to high school. For example, in 2008 the GER was higher for males (100%) than for females (98%) in primary school, giving a GPI of 0.97, mainly as a result of the higher repetition rate among male learners than female learners at this level. In secondary school the situation was reversed and while the GER for females was 92%, it was only 84% for males, giving a GPI of 1.06, indicating that a far bigger proportion of male than female learners were not participating in secondary schooling (Department of Education, 2010:8).

A high rate of students dropping out in the last three grades of high school remains a problem for both genders, despite the improvement in the throughput rate at the top end of secondary school. The Ministerial Committee on Learner Retention in the South African Schooling System provides data on learner dropout and survival rates (Department of Education, 2008). The Report shows that repetition is high in Grade 1 and in senior grades, especially in Grade 11 (possibly due to pressure on schools to produce good National Senior Certificate results). During the first eight years of school the dropout rate is minimal, and the survival rate of those completing Grade 9 has improved substantially over time and currently stands at over 85%: of those children born between 1985 and 1989, 86.2% completed Grade 9, compared to 81.1% of the 1980 to 1984 birth cohort, 78.8% of the 1975 to 1979 birth cohort, and 71.6% of the 1970 to 1974 birth cohort (Department of Education, 2008:27). However, after Grade 9 the survival rate drops substantially and there has been no change in this pattern since the 1970 to 1974 birth cohort. Of those learners in Grade 9, just under 90% reach Grade 10, about three-quarters reach Grade 11 and between 55% and 60% reach Grade 12 (Department of Education, 2008:28): as a result, only slightly more than 46% of the 1980 to 1984 birth cohort who started Grade 1 eventually reached Grade 12 (Department of Education, 2008:xiii).

The inefficiency that occurs as a result of the high number of learners repeating a grade (resulting in overage enrolment) or dropping out of school (causing wastage in the system) can be seen in the average number of learner-years required to reach Grade 12. This has been calculated using a simple methodology with one year's data rather than a year-by-year enrolment progression (Shindler, 2010). In 2007 it took an average of 7.3 learner years to complete primary school – down very slightly from 7.5 years in 2005. The average number of learner-years required to attain Grade 11 dropped from 13.4 to 12.4. However, it takes 19.2 years of learner effort to reach Grade 12. While this is an improvement on a figure of 21.8

learner years in 2005, the average number of learner-years of effort for a learner to reach Grade 12 in 2007 was 60% more than the minimum twelve years.

A survey conducted by the Centre for Applied Legal Studies of the University of the Witwatersrand and Social Surveys in 2007 concluded that four percent of children at school at the time of the survey had missed a year or more of schooling, with 3.6% of those still in the Basic Education Phase and 6.4% of those in the FET Phase having been absent from school for a year or more (Social Surveys, 2010). South Africa has a large number of overage learners in the schooling system. Thirty-eight percent of Grade 12 learners are two or more years above their age-grade norm: one of the reasons for learners experiencing “school delays” is long term absence from school. A small proportion of children are also not entering school at the right age (7.3% started after age seven). However, the primary reason for school delays in South Africa is due to grade repetition, with one-third of children registered in 2007 having repeated a year at some time in their school career: 21% in the Foundation Phase had repeated, while 52% of learners had repeated by the time they were in the FET Phase. The survey concludes that every second learner in Grade 12 in 2007 had repeated a year, and that grade repetition is associated with poverty: rurality, race and parental education all proxy for poverty. Most worrying is the conclusion that being overage and having repeated a number of times, may increase vulnerability to leaving school before completion of secondary school:

Many children in South Africa travel slowly through the education system, with significant cost implications for the state, for the household and possibly, psychologically for many of the overage learners themselves. The age-grade norms act as an important benchmark for South Africa, but the gap between this ideal and reality is stark. (Social Surveys, 2010:15).

It seems obvious that a large part of the inefficiency at the top end of the high school is the result of the poor preparation of learners in the rest of the system, and in particular, of the very poor foundation laid in the early years, and it is the association between age and performance that is the primary focus of the present paper.

3. The National School Effectiveness Study (NSES)

The investigation draws its data from the NSES, which followed a cohort of pupils from Grade 3 in 2007, through Grade 4 in 2008 and Grade 5 in 2009. The project administered the same tests to these learners each year and also collected data on home background, learner characteristics, teacher knowledge, learner writing, school resources, and curriculum management practices in a sample of 268 schools from eight of the nine provinces². The sample was drawn at random from the South African primary school population, stratified and weighted by province and school quintile, the latter a (not uncontentious) government classification of schools by socio-economic status.

Learner performance, as measured by literacy and numeracy tests, is the dependent variable for the NSES. The tests were constructed to assess knowledge and skills specified in the national Grade 3 curricula for literacy and numeracy. Test design and construction occurred as part of a programme led by the Department of Education to produce instruments for the Systemic Evaluation (SE) Grade 3 exercise, administered to a national sample of learners in 2007, of which the NSES sample is a subset. As part of this process, curriculum experts from the Department of Education, provincial departments, and NGOs worked with senior teachers to formulate test items. Draft instruments were piloted and refined using classical Item Response Theory methods. A major difference between the SE and NSES test programmes is that, while the former was done in the home language of the children, the NSES tests were in English. The reason for this change is that most African children switch from home language to English in Grade 4, and we wanted to keep the language of testing constant throughout the study. This difference, together with the fact that NSES learners were also part of the SE exercise, provides an opportunity to compare performance of the same learners in home language and English.

The literacy test was designed to assess the following areas of knowledge and skill: word recognition, reading a variety of texts (non-fiction, fiction, poster, bar graph), literal comprehension of the text, inferential comprehension, justifying answers, and writing sentences. The numeracy test focused on the following areas: counting and ordering numbers, the four operations (addition, subtraction, multiplication and division), and reading and using data. At 40 items for the literacy instrument and 53 for the numeracy test, some of the skill categories contain too few items to carry a meaningful diagnostic analysis, and consequently we report below only on the principal skills assessed by the two instruments.

Because of the great variation across the South African system³ the range of items included in any national test should include questions drawn not only from the curriculum for the grade level being assessed, but also significant numbers drawn from the curricula for at least the two previous grades. Without this design specification, a large proportion of the sample would not register on the test scale. Thus, the NSES literacy test included a significant proportion of word recognition exercises, both with visual cues and in cloze format. Similarly, in the numeracy test only just over half of the items are pitched at the Grade 3 curriculum, with the remainder spread over Grades 1, 2 and 4, thus picking up slow learners at the bottom end of the scale, ensuring that top end learners don't go off scale, and allowing for some growth during the three years of the study. The tests were accompanied by a learner

² Gauteng was part of the original sample, but was withdrawn when the provincial government instituted a census testing programme in 2007.

³ The very high variability in the South African school population is reflected in a rho value of 0,7 for the country, almost twice that of the next highest figure in Africa (van der Berg, 2005).

questionnaire, which provides information on learner (age, gender) and home (poverty, parental educational practices) characteristics.

3.1 Methodology

The topic of school dropout is one which receives much media attention in South Africa but, while it is agreed that the dropout rate is high in the last three grades of high school, much of the debate is characterised by misconception and poor methodology (Department of Education, 2008; Taylor, 2010). In an attempt to get clarity on the issue, the minister of education appointed a commission to investigate learner retention in the system. The commission used data from the General Household Surveys, the Labour Force Survey and the Census to derive estimates of the population, and compared these to school enrolment in order to arrive at survival rates of selected birth cohorts, and hence at dropout rates at the end of each grade for the respective birth cohort (Department of Education, 2008). Similarly, the investigation into access to schooling in South Africa completed in 2009 used a nationally representative survey of 4,400 households (Social Surveys, 2010). This is also essentially the method used to construct the graphs in Figures 1 and 2 above.

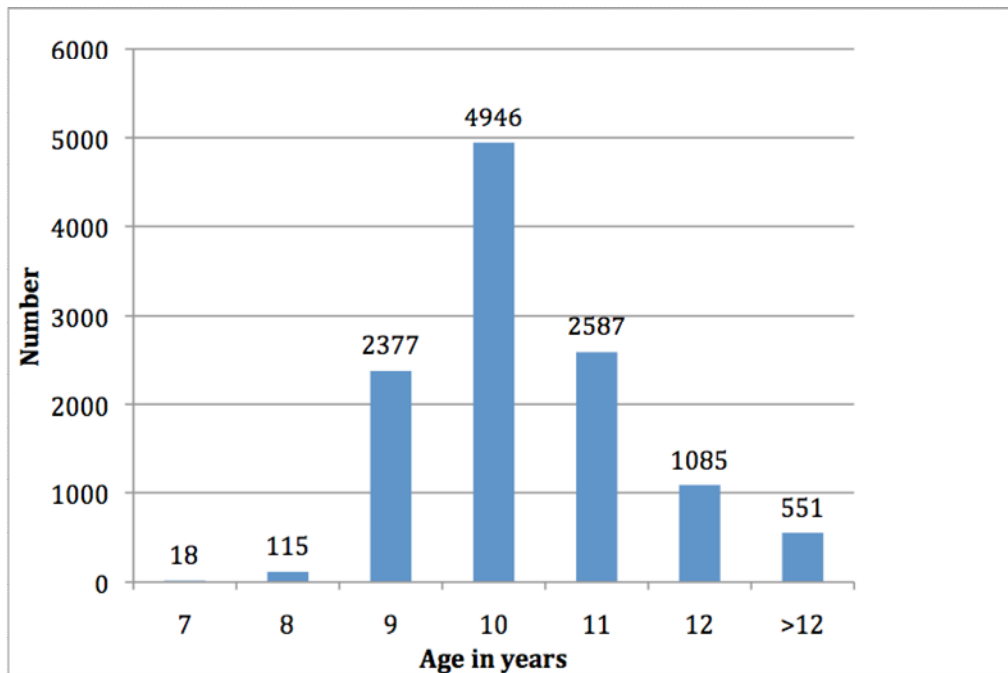
The present paper approaches the issue from another angle: we use the birth date given by learners in our sample to calculate the age at the time of testing of Grade 4 learners. We then show the relationship between age, on one hand, and gender, poverty and test scores in literacy and numeracy, on the other. A strength of this method is its ability to determine age accurately and to link test scores to age and gender, but it is unable to distinguish the cause of overage enrolment, which may be derived from grade repetition or late school entry.

3.2 The profile of Grade 4 learners in South Africa

3.2.1 Age

The NSES tested children in August/September in each successive grade. Thus, the modal age for Grade 4 learners at the time of testing in 2008 was nine or ten, which is confirmed by the distribution of learners in Grade 4 (Figure 4). Ten-year olds predominate by over two to one, which is to be expected given that the testing occurred eight or nine months into the year.

Figure 4: Distribution of NSES Grade 4 learners by age, 2008



Only 62% are appropriately aged (42% are ten and 20% are nine), with 35% being overage (eleven or older) and one percent underage (younger than nine). It is clear that the school admission policies are succeeding in keeping underage learners out of school, whether this is a good thing in itself remains to be seen, depending on how younger learners perform, a point we return to below. An overage population of 35% seems high after only four years of schooling. Some of these learners may be losing time and falling behind their peers, through drifting in and out of school. A second possible reason for the magnitude of the overage category is grade retention. Finally, some of those aged eleven or older may have started school late. It is not known what the respective contributions are to the overage fraction of these three possible explanations. What is clear, however, is that, if these figures do indeed reflect the situation on the school population, then they ask questions about the data shown in Figure 3: the Grade 4 enrolment may be only slightly (3.5%) larger than the population of the age cohort, but only around two-thirds of learners enrolled appear to be appropriately aged.

3.2.2 Gender

The gender distribution by age is most interesting (Table 1). Girls outnumber boys in the underage category and in the younger fraction of the appropriate age group. These proportions are reversed in the older age-appropriate fraction, and in the overage category boys outnumber girls by two to one. Overall boys constitute 51.6% of the Grade 4 cohort; this small majority is largely due to the influence of overage learners, where boys predominate.

Table 1: Gender distribution by age (percent)

Gender	Age in years					Total
	7	8	9	10	11+	
Girls	58.1	59.7	53.3	41.6	33.5	48.4
Boys	41.9	40.3	46.7	58.4	66.5	51.6

3.2.3 Socio-economic status

The home background data (chief of which were the relationship of the learner to the primary caregiver and other adults in the home, number of siblings, availability of amenities and appliances, and the presence of books and newspapers) was used to construct an index of SES for each child. We divided the SES spectrum into five categories and Table 2 shows the percentage of each age group distributed across the SES categories, with SES 1 being the poorest. Ignoring the seven and eight year olds because of the small numbers in these two age classes, the pattern is very clear: higher SES categories dominate the appropriately aged classes, while lower SES categories are far more prominent among overage learners. In other words, poor children are far more likely to be overage than their more affluent peers; conversely, relatively affluent children are more likely to be appropriately aged.

Table 2: Age of Grade 4 learners by socio-economic status (percent of age class)

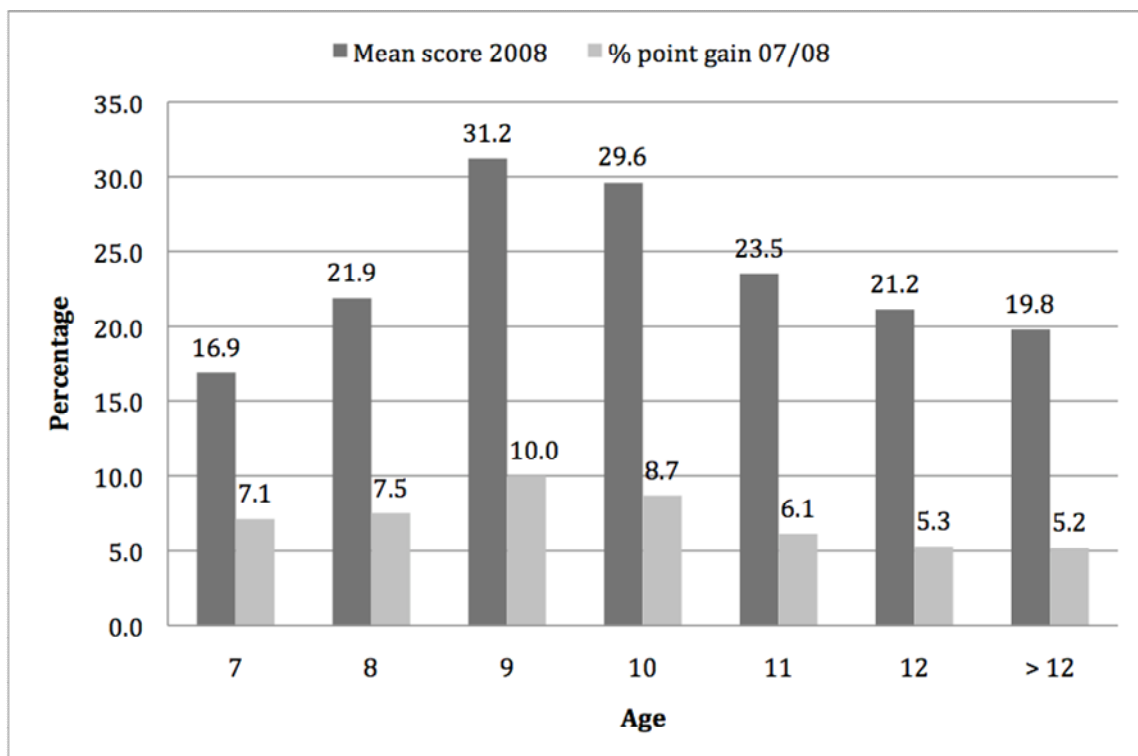
SES category	Age in years							Total
	7	8	9	10	11	12	>12	
1	18.8	23.2	12.6	15.8	23.0	28.1	38.3	20.0
2	25.0	19.7	18.4	21.2	23.7	25.3	28.4	22.2
3	28.1	25.4	21.8	20.3	21.9	22.1	17.9	21.0
4	12.5	19.7	20.1	17.9	16.7	14.1	9.2	17.0
5	15.6	12.0	27.1	24.8	14.7	10.4	6.2	19.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4. Literacy scores

4.1 Overall scores and gains by age

With an overall mean literacy score of 27.2% in the literacy test in 2008, the literacy levels among the Grade 4 learners is clearly very low. Within this poor performance, appropriately aged learners (i.e. those aged nine and ten years of age) achieved the best results with nine year old learners performing slightly better (with a mean score of 31.2%) than ten year olds (with 29.6%), a difference which is statistically significant ($t=3.86$). Eleven-year olds achieved the next highest score (23.5%), followed by eight year olds (21.9%), twelve year olds (21.2%), those older than twelve (19.8%), and finally seven year olds (16.9%) (Figure 5). The mean literacy score for learners aged nine and ten years old was 30% while the average score for learners aged eleven and above was 22%, a difference of eight percentage points. These results contradict the few comparable figures described above, where the older fraction of any age-appropriate cohort generally outperforms the younger fraction; among South African Grade 4 learners nine year olds score higher than ten year olds. Interestingly, those aged eleven do slightly better than eight year olds, but the latter in turn do better than those twelve and older. However, care needs to be exercised in assessing the performance of seven and eight year olds, because of the very low numbers in both categories.

Figure 5: NSES Grade 4 literacy scores by age, 2008



While there is a very weak negative correlation between age and literacy scores (-0.08)⁴ the correlation shows that the older the learners the more likely their scores are to be lower (see Table 7 in Appendix 1).

⁴ This is statistically significant at 99%

All age groups in the sample showed progress in reading and writing between 2007 and 2008. The lowest gains were recorded by children twelve or older, who scored a mean improvement of five percentage points, which is a quarter more (25%) than the scores they achieved in 2008. Highest gains were recorded by nine year olds, who improved by ten percentage points, or nearly a third (32%) more than they scored in 2008. Ten-year olds were next in gains, but were outperformed by those aged nine by 1.25 percentage points. In terms of literacy scores, seven and eight year olds gained more than those aged eleven and twelve or older.

4.2 Performance by literacy skill

Care needs to be exercised in interpreting the respective scores by literacy skill: for example, a difficult item on a relatively easy skill may give a lower score than an easy item on a difficult skill. Also, as we have said some of the skill categories contain low numbers of items, while the underage learner categories also contain low numbers. Therefore the scores in Table 3 should only be read in orders of magnitude. It is clear, however, that most children in the sample are only really comfortable in recognising words: scores on all other literacy skills are mediocre at best. It is also clear that learners of all ages have a very poor grasp of the higher cognitive skills – inferential comprehension and justifying answers, with the latter being particularly poorly done. Scores on each of the skill categories by age generally follow the pattern for total scores shown in Table 5: nine year olds score best, followed by those aged ten, eleven and eight.

Table 3: Scores (mean percent correct) by literacy skill and age, 2008

Age in years	Matching words to pictures	Cloze test	Writing a sentence to describe a picture	Literal comprehension of non-fiction text	Literal comprehension of fiction text	Inferential comprehension	Justifying answers	Mean Literacy score
7	46.9	19.5	12.0	18.4	35.4	18.8	0	16.9
8	63.8	36.8	30.1	19.8	26.1	19.0	0.9	21.9
9	67.0	47.9	41.4	34.3	38.5	23.1	5.4	31.2
10	64.0	45.3	39.4	31.9	37.0	21.9	4.6	29.6
11	56.2	39.7	28.8	23.5	31.3	19.3	1.8	23.5
12	52.4	36.8	23.3	20.1	29.4	19.0	1.2	21.2
>12	48.9	32.8	18.6	18.8	27.3	18.2	0.6	19.8
All ages	60.1	42.3	33.7	27.8	34.2	20.8	3.3	27.2

4.3 Performance by gender and age

Girls outperform boys by around three percentage points in all but the very youngest age categories, with an overall advantage of about four percentage points (Table 4). However, there appears to be a very weak correlation between gender and literacy scores (0.09)⁵ (see Table 7 in Appendix 1).

⁵ This is statistically significant at 99%

Table 4: Literacy scores by gender and age (mean percent correct)

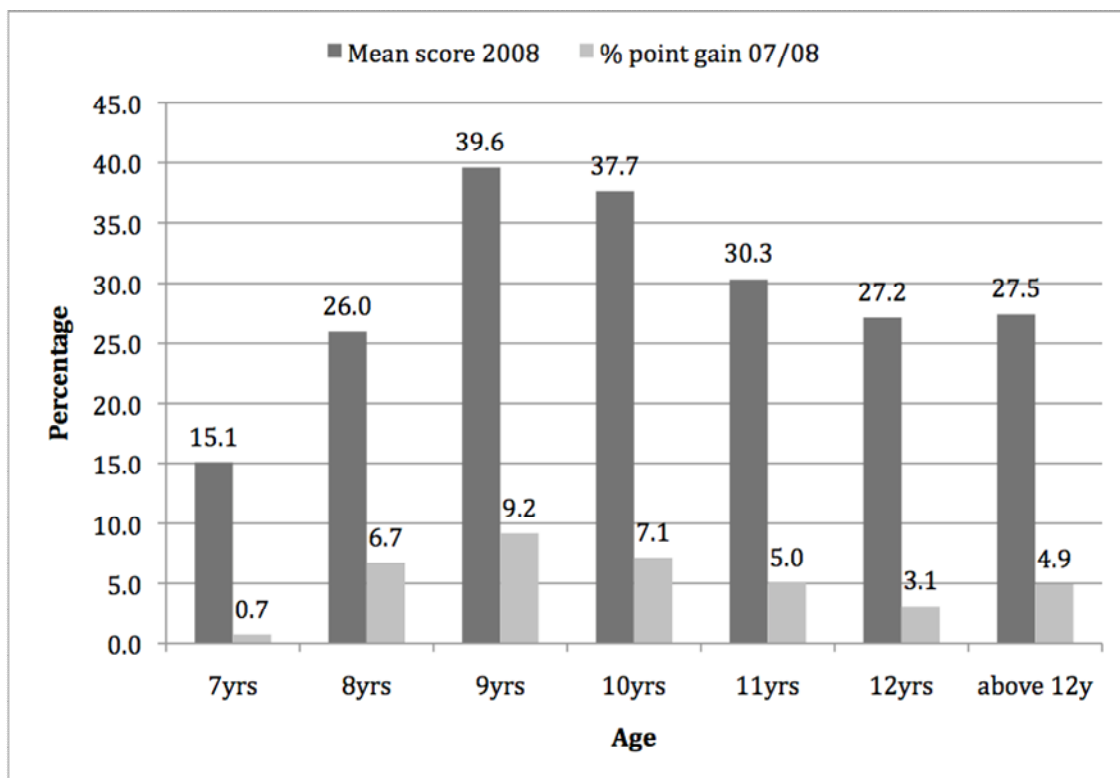
Gender	Age in years							Total
	7	8	9	10	11	12	>12	
Boy	18.5	20.9	32.0	29.7	23.3	20.9	18.6	25.8
Girl	16.7	25.6	33.7	32.6	26.1	22.8	21.0	30.1

5. Numeracy scores

5.1 Overall scores and gains by age

Numeracy levels among the Grade 4 learners are also clearly very low (Figure 6), and there is a high correlation between the literacy and numeracy scores (0.79)⁶ (see Appendix 1). Mean scores by age on the numeracy test of Grade 4 learners followed the same patterns as those shown by the literacy results, except for a shift in the position of eight year olds. Appropriately aged learners (i.e., those aged nine and ten) achieved the best results, again with nine year olds performing slightly better (39.6%) than ten year olds (37.7%), a statistically significant difference ($t=3.41$). They were followed by those aged eleven, and twelve, twelve+ and 8, respectively. The mean numeracy score for learners aged nine and ten years old was 38% while the average score for learners aged eleven and above was 29%, a difference of nine percentage points. Also, again following the literacy trends, the greatest gain scores between 2007 and 2008 were achieved by nine year olds, followed by those aged ten and 8. Interestingly, and bearing in mind our caveat against over-generalising from the data for eight year olds, although younger learners were outperformed in absolute scores by those aged twelve and older, eight year olds improved both their literacy and numeracy skills faster than overage children between 2007 and 2008.

Figure 6: NSES Grade 4 numeracy scores by age, 2008



As with literacy, there is a very weak negative correlation between age and numeracy scores (-0.08)⁷. However, the correlation does show that the older the learners the more likely their scores are to be lower (see Appendix 1).

⁶ This is statistically significant at 99%

⁷ This is statistically significant at 99%

5.2 Performance according to numeracy skill

The same caveats regarding the comparison of literacy scores by different skills mentioned above need to be exercised in regard to numeracy skills. For example, all age groups performed considerably better on the multiplication items than on those involving addition, a result which is somewhat counterintuitive: this is probably attributable to the fact that a number of the multiplication items were visually presented and could therefore be answered by counting rather than by multiplying (Table 5). However, here too, the orders of magnitude of mean scores on each skill category are insightful. It is clear that Grade 4 learners, across all age classes, are not coping at all well with the fundamental arithmetic operations: even on counting and ordering numbers, the foundation for all other primary school mathematics, results are not at all encouraging.

Table 5: Mean scores (percent correct by numeracy skill and age, 2008)

Age	Counting	Ordering	Patterns	Addition	Subtraction	Multiplication	Mean Numeracy score
7	14.9	25.0	10.7	10.5	8.9	17.5	15.1
8	35.8	50.7	22.9	17.7	12.9	32.4	26.0
9	52.5	60.1	35.6	33.8	23.6	47.8	39.6
10	49.6	58.9	33.0	31.4	22.7	45.5	37.7
11	40.8	51.1	25.8	23.0	16.3	37.4	30.3
12	37.2	46.9	21.5	20.1	14.0	33.3	27.2
12+	34.5	41.8	20.2	19.5	13.3	32.8	27.5
All ages	45.2	54.3	29.3	27.4	19.5	41.4	34.7

5.3 Performance by gender and age

Numeracy scores are very close for boys and girls across all age (Table 6) and there is a negligible correlation between gender and numeracy scores⁸ (see Appendix 1)

Table 6: Numeracy scores by gender and age (mean percent correct)

Gender	Age in years							Total
	7	8	9	10	11	12	>12	
Boy	14.50	26.93	40.16	37.14	29.45	26.13	24.34	32.38
Girl	14.31	26.35	39.13	37.77	30.19	26.91	25.34	34.91

⁸ This is statistically significant at 99%

6. Conclusion

This study indicates that one-third of learners in Grade 4 are overage. The age distribution shows that more than one in five learners has lost a grade in the first four years of schooling, while more than one in ten have lost two grades. These patterns are marked by SES and gender, with poor children and boys far more likely to be overage. Possible causes of this distribution would include learners failing a grade and being retained, learners drifting in and out of school, and learners starting school late. The mix of these and any other contributory factors slowing the progress of learners through the system is not known and is an issue that begs further investigation. The weight of available evidence suggests that the main root of this problem is grade repetition. Teachers and principals understand repetition as an appropriate and effective remediation mechanism that will give a learner an opportunity to “catch up”. However, many authors question the benefits of grade repetition, recommending that, rather than sit through an additional year of the same curriculum, these learners should benefit from a remedial programme (Kenny, 1991; Jimerson et al, 2002; Alexander et al, 2003; Department of Education, 2008).

The present study provides evidence to show that the inefficiencies in the South African school system begin in the early grades, and that by Grade 4 they have reached significant proportions. It is also clear that learner scores on the NSES literacy and numeracy tests confirm what every other testing programme – provincial, national and international⁹ – tells us about the poor state of learning which characterises the system: the seeds of low pass rates at Grade 12 level, and of low participation and throughput rates in further and higher education are sown in the first three years of schooling. What the present study adds to this picture is that overage children perform less well than their appropriately aged peers, and also gain less learning from one year to the next. It seems likely that this relationship begins with children experiencing learning difficulties, with slower learners falling behind and becoming overaged for their grade; it is possible that this situation then reinforces the learning difficulties, through loss of self-esteem. Whatever the precise relationship between overage and under-performance, it is a major problem in the system, and giving explicit attention to it must constitute a significant component of any strategy to address the very poor learning outcomes of the school system, the slow progress of learners through the grades, and the high rate of dropouts in the last three years of the secondary school. As the large number of overage learners achieving low numeracy and literacy scores has shown, grade repetition that involves “doing the same thing over and over again and hoping that what did not work the first time somehow will work the second time” (Department of Education, 2008:84), has not been successful.

What is to be done? First, in order to help low performing learners to achieve at acceptable levels, interventions must begin in the first three years of schooling and before. Access to good quality early childhood development programmes is essential as there is growing evidence that learners who have participated in such programmes or some pre-primary schooling, do better in school than those who have not (see UNESCO, 2006). The Department of Education originally planned to phase in the public provision of Grade R as part of the primary education level, so that by 2010, all children entering Grade 1 would have participated in an accredited reception year programme (Department of Education, 2001).

⁹ For example, in tests conducted as part of the Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ), South Africa was placed ninth in both reading and mathematics at grade 6 level, well behind a number of much poorer countries (Moloi and Strauss, 2006) .

The Department was unable to meet this deadline and has now set 2015 as target date by which all learners enrolling in Grade 1 should have benefited from Grade R. Secondly, improving the quality of teaching and learning is fundamental if learners are to master basic skills. Thirdly, policy interventions should focus on vulnerable groups, including poorer children and boys. Finally, as grade repetition appears to be ineffective in many instances in addressing learning problems, special programmes should be established which do not simply repeat the learning and content that learners experienced the first time (Department of Education, 2008).

The study raises the secondary although not uninteresting question concerning the most appropriate age for entering school. Limited evidence from the research literature indicates that the older fraction of any appropriate age cohort outperforms the younger fraction, but in the NSES data this pattern is reversed, with younger children outperforming their older classmates. The effect is not large and is probably influenced by the gender balance, skewed towards girls in the younger fraction. However, it also raises the question as to whether lowering the admission age may be worth considering.

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*Seeds of Their Struggle:
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Appendix 1

Table 7: Correlations between age, gender, SES, literacy scores and numeracy scores of Grade 4 learners, 2008

	Age	Gender	Poverty quintile	Literacy score	Numeracy score
Age	1				
Gender	-0.0287*	1			
Poverty quintile	0.0022	0.0269*	1		
Literacy score	-0.0829*	0.0872*	0.3963*	1	
Numeracy score	-0.0844*	0.0362*	0.3139*	0.7942*	1

* Significant at 99%



Consortium for Research on
Educational Access, Transitions & Equity
Funded by DFID

Report summary:

Using data drawn from the National School Effectiveness Study, this paper reveals that by Grade 4 35% of South African learners are overage. The study confirms what every other testing programme tells us about the poor state of learning which characterizes the system: the seeds of low pass rates at Grade 12 level, and of low participation and throughput rates in further and higher education, are sown in the first three years of schooling. What the present study adds to this picture is that overage children perform less well than their appropriately aged peers, gain less learning from one year to the next, generally come from poorer homes than their appropriately aged peers, and are predominantly male. This is a major problem in the system, and giving explicit attention to it must constitute a significant component of any strategy to address the very poor learning outcomes of the school system, the slow progress of learners through the grades, and the high rate of dropouts in the last three years of the secondary school.

Author notes:

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